REGIONAL INEQUALITY AND THE PROCESS OF NATIONAL DEVELOPMENT: A DESCRIPTION OF THE PATTERNS

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REGIONAL INEQUALITY AND THE PROCESS OF NATIONAL DEVELOPMENT:

> . . . the stresses of the dislocation incident to early phases of industrialization in the developed countries were sufficiently acute to strain the political and social fabric of society, force major political reforms, and sometimes result in civil war. . . Can the political framework of the underdeveloped societies withstand the strain which further widening of income inequality is likely to generate?
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> — Simon Kuznets, Presidential Address delivered to the American Economic Association, December 29, 1954

ECONOMIC DEVELOPMENT
AND CULTURAL CHANGE

VOLUME XIII · NUMBER 4 · PART II · JULY 1965

REGIONAL INEQUALITY AND THE PROCESS OF NATIONAL DEVELOPMENT: A DESCRIPTION OF THE PATTERNS*

I. Introduction

Economists have long recognized the existence and stubborn persistence of regional dualism at all levels of national development and throughout the historical experience of almost all presently developed countries. Increasingly active theoretical discussions, empirical research, and especially political concern with this aspect of economic growth has given the phenomena of regional imbalance and inequity a popular new term—the "North-South problem." In spite of the recent attention which this problem has attracted, very little progress has been made in formulating and testing a general explanation for the occurrence of inequality in the spatial distribution of national income. One only needs to observe that Frenchmen, Italians, Brazilians, and Americans still tend to treat their North-South problems[1] as unique to their own national experience with economic growth. This may be explained by the fact that only a small amount of research effort has been devoted to comparative studies of

* A number of agencies and individuals have aided us in gathering the data which made this study possible. To all of them we give our thanks. It would be fitting at this point to express our gratitude especially to Richard A. Easterlin, Simon Kuznets, Colin Clark, John A. Brittain, and Alfred Conrad for their help and stimulating suggestions. Thanks should also go to the Social Science Research Council for supplying financial assistance for this study; to the Vanderbilt University Computer Center for their generous help; and to the Wisconsin Social Systems Research Institute for secretarial assistance.

1. Throughout this paper we use such terms as "North-South problem" and "regional dualism" interchangeably with regional income differentials. They are not to be interpreted literally, since in comparing regions there is a whole spectrum or range of regional differentials—not just a dichotomy. Furthermore, it must be obvious to the reader that North is not equivalent to developed for all nations. These are purely literary simplifications.

regional inequality as related to the process of national development.[2] This empirical investigation into the nature of spatial inequality within national borders and over the development spectrum is an attempt to fill that void. Unfortunately, only a description of the aggregate patterns is presented here. It must be frankly admitted that, to a large extent, the more difficult task of disaggregation and identification of causation is left untouched.

II. Expectations

There is an abundant accumulation of theoretical writings in which hypotheses about the nature of regional inequality during the development process are implied. Given that significant economic growth first appears in one region of a national state, it should occasion no surprise that the ***absolute differential*** between rich and poor regions (North and South) should persist or even increase. Even if both regions should grow at the same percentage rate after the fortuitous "random shock" in the North, the absolute regional differential will not only persist but increase. Regional income differentials are measured in this paper, however, in terms of relatives, not absolutes: the income per capita of each region is taken as a percentage of the average national income per capita. For example, the Brazilian Northeast in 1959 contained 25 percent of Brazil's population but only 10 percent of her income. The Southern states, on the other hand, contained 35 percent of the population but 50 percent of the income. In a less awkward fashion, the degree of inequality may be better summarized by indicating that most of the Northeastern states had per capita incomes of less than 50 percent of the Brazilian national average.

An inequality measure of this sort implies a comparison of regional growth rates and is much more informative for our purposes than one which considers absolute differentials.[3] Using this measure as the most appropriate index, what ***a priori*** notions might we have about the behavior of regional income differentials as national development proceeds? Does our "historic and current system of social and economic organization [perpetuate] interregional growth and income differentials once they come into existence?"[4] The answer may be as easy, or as difficult, as explaining why growth tends to be high and self-sustaining in nations which have already experienced it and so difficult to generate in currently underdeveloped Asian and African nations. The increasing divergence in international income per capita levels, at least prior to World War II, is well known, and a similar theoretical apparatus may be used to

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2. There are, of course, significant exceptions. Besides the increasing empirical evidence relating to well-known North-South problems in Italy and Brazil, there has been an active interest in regional inequality in American historical development. See, for instance, Richard A. Easterlin, "Interregional Differences in Per Capita Income, Population, and Total Income, 1840-1950," in ***Trends in the American Economy in the Nineteenth Century*** (Princeton: Princeton University Press, 1960), pp. 73-140 (hereafter called ***Trends);*** and Frank A. Hanna, ***State Income Differentials, 1919-1954*** (Durham: Duke University Press, 1959). Furthermore, the ***Economic Survey of Europe in 1954*** (Geneva, 1955), Ch. 6, pp. 136-71, devoted a good part of that issue to an examination of regional imbalance and inequality within the European nations. For the most recent examples of studies of this sort see José Raymon Lasuen, "Regional Income Inequalities and the Problems of Growth in Spain," Regional Science Association ***Papers,*** VIII (1962), 169-88; Minoru Tachi, "Regional Income Disparity and Internal Migration of Population in Japan," ***Economic Development and Cultural Change,*** XII, No. 2 (January 1964), 186-204; Werner Baer, "Regional Inequality and Economic Growth in Brazil," ***Economic Development and Cultural Change,*** XII, No. 3 (April 1964), 268-85.

3. The problem of choice of indices is clearly an important one; we discuss this point below at length.

4. R. B. Hughes, "Interregional Income Differences: Self-Perpetuation," ***Southern Economic Journal,*** XXII (July 1961), 41.

predict increasing divergence among geographic units *within* national borders and perpetuation of *"pôles de croissance."*[5]

But presumably economic interdependence among regional units within nations should be much stronger than between countries themselves. Retaining the most restrictive classical assumptions, internal factor mobility should tend to eliminate interregional income per capita differentials, geographic dualism, or spatial polarization. Under conditions of free factor mobility, and abstracting from transportation costs, spatial inequality can persist only via lags in dynamic adjustment. That spatial inequality, depressed areas, and backward regions appear to persist may simply suggest to some that internal factor flows (tending to reduce interregional inequality) do not occur with sufficient speed and quantity to offset the dynamic indigenous conditions which cause relatively faster resource augmentation and technological change in the rich developing regions (tending to increase inequality).

In fact, one could reasonably appeal to the high degree of sectionalism, fragmentation, and general national disintegration in the youthful stage of national development to predict increasing regional inequality during those early decades. Given that young nations historically, as well as those currently, embarking on modern economic development have been typically devoid of national labor, capital, and trade markets approaching even rudimentary degrees of efficiency, this seems the only reasonable prediction. Regions within nations do not typically possess equal capacity for growth, and when development begins in some of these islands, regional barriers may be too great to communicate the growth stimulus to other less fortunate regions. As long as the barriers to trade and factor flows (as well as communication of technological change) persist, regional inequality will clearly increase.

The problem is hardly that simple, however. Myrdal's theorizing about backwash effects, Hirschman's concern with dualism and polarization, and Kuznets' more cautious "empirical" guesses suggest that even internal factor flows may not always be equilibrating in the classical fashion. On the contrary, in the initial stages of national development regional inequality is likely to increase all the more sharply due to a number of disequilibrating effects.[6]

A. Labor Migration

Interregional labor migration is likely to be extremely selective because of either the prohibitive money costs of migration at low levels of income or traditional inertia in the nonurbanized, non-industrialized poor Southern regions. The migrants may be characterized as the vigorous and entrepreneurial, the educated and skilled, and of productive age. (We are not describing the dominant characteristic of emigrants from the backward South, but suggesting that these characteristics will be more prevalent among the migrants than among the average population of the Southern regions.) Selective migration of this type obviously accentuates the tendency towards regional income divergence: labor participation rates, *ceteris paribus*, will tend to rise in the rich and fall in the poor regions; furthermore, precious human

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5. This is a term used often in French literature to describe regional growth differentials. See F. Perroux, "Note sur la notions de 'pôle de croissance,'" *Cahiers de L'Institut de Science Economique Appliquée*, Series D, No. 8 (1955), and Hirschman's use of the derivative "polarization" in his *The Strategy of Economic Development* (New Haven: Yale University Press, 1958), Ch. 10. It should be pointed out that the efforts of Perroux and his students have not added much to our knowledge of the *process* of interregional communication of growth. See Charles P. Kindleberger, *Economic Growth in France and Britain, 1851-1950* (Cambridge: Harvard University Press, 1964), pp. 259-60.

6. Disequilibrium here describes an internal factor flow which tends to increase regional inequality. We are not necessarily using it to describe factor movements which do not respond correctly to interregional factor price differentials. The two concepts may or may not coincide.

capital will tend to flow out of the South and into the North, making regional resource endowment per capita all the more lopsided and geographic imbalances all the more severe.

What has been said above about migration patterns in early development stages is hardly original to this study. It appears as one important theoretical buttress for the operation of both Myrdal's backwash effects[7] and Hirschman's polarization effects:

> Instead of absorbing the disguised unemployed, Northern progress may denude the South of its key technicians and managers as well as well as of the more enterprising young men. . . Thus actual pay differentials between North and South are likely to overstate considerably the real productivity differentials in the most productive and skilled grades. In addition, of course, mobility is highest in these same lines so that it becomes almost a certainty that the South will lose to the North first and foremost its more highly qualified people.[8]

To illustrate the potential disequilibrating effects of interregional labor migration, Eckaus has characterized migration patterns during the early stages of Italian industrial development as being precisely of this type, although his contention is not defended empirically:

> The nineteenth century was a time of extraordinary emigration, generally heavier in the South, where at some times and places it exceeded the natural increase in population. The concentration of immigrants in the younger, productive ages left the South with a working force of deteriorating quality.[9]

Dziewonski presents us with a contemporary example of the perverse effects of interregional migration at low levels of national development. He has noted that the Polish government has deliberately minimized interregional labor migration, since central planners are concerned with the past effects it has had in further contributing to regional inequality and dualism via effects upon relative participation rates and labor force quality.[10] This, too, appears to be consistent with the notion that in early stages of growth interregional labor flows may generate further spatial inequalities rather than reduce them. This would appear to follow from the fact that Poland has not reached a mature stage of growth.

B. Capital Migration

The interregional flow of private capital may tend to be perverse as well. External economies and general benefits derived from agglomeration of capital projects in the relatively rich Northern regions may cause capital to emigrate from the South to the North, tending to accelerate interregional inequality and to widen the North-South schism. High apparent risk premiums, lack of entrepreneurial ability, and immature capital markets may further depress investment activity and capital accumulation in the South. The latter, immature development of financial institutions, may prove to be not only important but also the most easily measurable of these factors in explaining perverse capital flows. Spain may serve as our example here:

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7. Gunnar Myrdal, *Economic Theory and Underdeveloped Regions* (London, 1957), Ch. 3-5.

8. Hirschman, *op. cit.*, pp. 188-89. The Canadian province of Nova Scotia was for a long time noted for its major exports of "brains" and fish.

9. Richard S. Eckaus, "The North-South Differential in Italian Economic Development," *Journal of Economic History* (September 1961), 317.

10. Kazimierz Dziewonski, "Theoretical Problems in the Development of Economic Regions," Regional Science Association *Papers*, VIII (1962), 47.

> Capital migrates mainly through the banking system. Spanish banks are highly of a mixed character, being commercial and industrial, and are highly oligopolistic. Seven banks handle more than seventy percent of the total credit. The result is that the deposits of the backward regions are transformed into credits for the industries in the north, particularly for those industries in which the banks participate. But capital migrates also via the capital market, for benefits are more certain and higher in the developed industrial sectors of the country. Most of the direct investment by entrepreneurs of Southern origin is also made in developed regions. Better infrastructural setting, superior transport and communications facilities, and larger markets all play a role.[11]

Nor is the evidence of perverse interregional flows of private capital isolated to the underdeveloped nations of Europe. The same pattern appears to exist in Pakistan, with heavy capital flows from East to West Pakistan, and in Indonesia, with similar flows from the outer to the central islands. And, of course, given our accumulated evidence that capital flows are heavily influenced by growth rates (demands for capital), capital "scarcity" in the South does not always imply high marginal productivity and high price.

C. Central Government Policy

The national or federal government's overt or unconscious intention to maximize national development may tend to increase still further the degree of regional inequality if active political expression in the South is lacking (as in the American post-Civil War Reconstruction period) or even in spite of such expression. In an overt fashion, the central government may allocate investment to the North, where "urgent demands for several types of capital-intensive public investments appear,"[12] which favors the fast-growing industrial regions and helps generate even more rapid growth there, only to create large social overhead capital requirements in the future. This is a common argument in the historical arsenal of Southern apologists in both Italy and the United States to explain relative lags in Southern industrial development.

In a less overt but equally important fashion, the central government may manipulate the external terms of trade in favor of the industrial North. A national tariff policy implemented with the intention of fostering and protecting industrial development, common to most underdeveloped nations past and present, clearly involves a geographic transfer to the rich Northern regions.[13] Southern senators and representatives in the United States were certainly aware of this and attached great importance to its effect during the three or four decades prior to the Civil War when their voice was important in American policy making.

D. Interregional Linkages

More generally, there may be a lack of interregional linkages in the early stages of national growth, so that the spread effects of technological change, social change, and income multipliers are minimized. Part of the national growth process is simply economic unification of regional markets. To the extent that such interregional linkages are slow in developing,

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11. Lasuen, *op. cit.*, pp. 179-80.

12. Hirschman, *op. cit.*, p. 192.

13. Eckaus questions the significance of a protective tariff policy in contributing to 19th and early 20th century Italian North-South differentials. *Op. cit.*, pp. 313-14.

national development is all the more likely to be regionalized in the earliest stages of growth. Furthermore, if the North possesses a large and productive agricultural area, "the South will be largely cut off from beneficial contact with Northern development, while remaining exposed to the adverse polarization effects."[14] This factor should help explain the relatively severe problems of North-South dualism which have persisted, for example, in the histories of Brazil's Nordeste, Colombia's Oriente, Italy's Mezzogiorno, and the U.S. South.

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The working hypothesis of this study, however, is not that interregional divergence of income per capita levels will persist indefinitely into the mature stages of national growth. On the contrary, there are a number of reasons why we should expect the elements which tend to cause divergence to diminish over time, allowing the more classical equilibrating effects to make themselves felt.[15]

E. Labor Migration

Migration is likely to become less selective as economic development proceeds. There are a number of justifications for this expectation. Growth will have been occurring in the poor regions, although at a slower rate, and the prohibitive costs of migration may disappear, eliminating the bias against the unskilled and low-income groups in the Southern regions. Traditional rural inhibitions to interregional migration should have been significantly weakened by whatever economic progress has occurred in the South. Occupational wage differentials between the skilled and the unskilled are likely to diminish in the North relative to the South, further causing a change in the composition of internal migration. The South may not only retain its educated and skilled, while losing its unskilled, but may even attract the former type of migrant from the North.[16] At any rate, it certainly seems likely that the rate of internal labor mobility should increase as the integration of regional markets into a truely national economy proceeds. This has been the case historically for most developing nations: even after the Turnerian frontiers were filled in the United States in the 1890's, population mobility refused to decline and even increased in recent decades;[17] the same appears to have been the case in France, since the degree of population mobility has increased throughout the late nineteenth and early twentieth centuries.[18]

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14. Hirschman, *op. cit.*, p. 189. See also John Friedman's discussion of regional dualism in "Regional Planning: A Problem in Spatial Integration," Regional Science Association *Papers*, V (1959), 167-79.

15. "Myrdal's analysis strikes me as excessively dismal. In the first place, he fails to recognize that the emergence of growing points and therefore of differences in development between regions... is inevitable and is a condition of further growth anywhere. Secondly, his preoccupation with the mechanism of cumulative causation hides from him the emergence of the strong forces making for a turning point once the movement toward North-South polarization within a country has proceeded for some time." Hirschman, *op. cit.*, p. 187.

16. What little evidence we do have suggests that this is certainly the case of the American South in the post-World War II period. Just how far back in American economic history this pattern can be traced is uncertain.

17. See Stanley Lebergott, *Manpower in Economic Growth: The United States Record Since 1800* (New York: McGraw-Hill, 1964), esp. Ch. 3, pp. 74-130.

18. L. M. Goreux, "Les Migrations Agricoles in France Depuis un Siecle et leur Relation avec Certains Facteurs Economiques," *Etudes et Conjuncture* (April 1956), 331.

F. Capital Migration and Interregional Linkages

Not only should the economy tend to develop a national labor market after experiencing continued secular growth, but more efficient national capital markets should evolve apace. If indeed perverse interregional capital flows had been typical of early growth stages, the development of more sophisticated capital markets in the Southern regions themselves should help deter the net outflow of capital. External economies and benefits accruing from agglomeration of capital projects may eventually become exhausted at the margin in the North while they begin to assert themselves in the poorer Southern regions as industrialization proceeds there (albeit, perhaps, at a slower rate). Finally, if growth becomes relatively rapid in the South due to any other factors, the capital flow will most likely undergo a natural reversal.[19] In Myrdal's terminology, the spread effects may begin to assert themselves from those islands of industrial growth as the economy fully integrates itself and commodity and factor markets become more efficient.

G. Central Government Policy

Perhaps most important, central governments may allow themselves the luxury of equality in the geographic distribution of income and pursue an active policy of income transfer to the poor regions. This may take the more dramatic form of TVA's, or regional concern may be implemented through highly-publicized institutions like the *Casa per il Mezzogiorno*, or it simply may result from a more general national commitment, not necessarily spatial, to welfare and equity. In the latter case, the appearance of a progressive income tax structure and concomitant welfare payments may be sufficient to create large regional transfers to the South without the emphasis on federal social overhead investment in the backward regions.

Finally, with regard to the central government's pattern of regional investment, it should be clear that after development has proceeded for some time, the need for public investment relative to private may tend to diminish, and in any case a larger portion of public investment may be financed from earnings of previous investments. This, of course, provides an excellent opportunity to alter the geographic composition of public investment in favor of the less developed areas.[20]

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Any one of these factors, or any combination of them, may be enough to cause regional inequality to diminish. Once the process of regional convergence or depolarization begins, however, it is likely to become cumulative, with the forces tending towards regional equality mutually strengthening each other contributing to a more rapid speed of adjustment.

The initial hypothesis of this study is, therefore, that the early stages of national development generate increasingly large North-South income differentials. Somewhere during the course of development, some or all of the disequilibrating tendencies diminish, causing a reversal in the pattern of interregional inequality. Instead of divergence in interregional levels of development, convergence becomes the rule, with the backward regions closing the development gap between themselves and the already industrialized areas. The expected result is

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19. We certainly know very little about interregional capital flows, but Professor Lance Davis of Purdue is currently adding a great deal to our knowledge. In his study of American history, he thus far has found significant evidence of sharp reductions in interregional interest rate differentials from 1870 to 1914.

20. Hirschman, *op. cit.*, p. 194.

that a statistic describing regional inequality will trace out an inverted "U" over the national growth path; the historical timing of the peak level of spatial income differentials is left somewhat vague and may vary considerably with the resource endowment and institutional environment of each developing nation.

The rest of this paper summarizes the empirical evidence concerning the relation between levels of development and regional inequality.[21] To achieve this end and to utilize such data as exist, we have used alternative techniques. First, an international cross-section analysis is pursued for twenty-four countries during the decade of the 1950's. Second, the cross-section approach is applied to the United States census data (1950 and 1960) where counties are treated as the regional unit and the states as nations. Third, national time series analysis is applied to those few countries for which data is available.

Finally, we shall also attempt to shed light on three other related questions. (1) What is the relative importance of income growth versus population redistribution in contributing to the time pattern of regional inequality? (2) What role does the labor participation rate play in producing differences in income per capita levels? (3) Does regional inequality differ sharply between industrial sectors?

III. International Cross-Section Analysis

The ideal measure of regional development in a study of this sort would be real income per capita (including income in kind) by geographic units which have maximum regional homogeneity. This ideal statistic is rarely available. First, the regional units are more or less given by the nature of decentralized political administrative units: for the United States the units are states; for Puerto Rico, *municipios;* for Canada, provinces; for Colombia, departments; for Spain, *provincias*. The regional units are not necessarily those which would be chosen by an economist or an economic geographer. Second, proper regional cost of living indices do not exist, and therefore any differential in regional price levels could possibly bias our results, since the data are usually given in the form of income in prices prevailing for the national unit. The nature of the regional units is unlikely to impart a systematic bias into the study, but regional price level differentials may be a serious problem, since the cost of living is usually lower in the poor agricultural regions. Furthermore, the divergence between regional price levels is likely to diminish as the nation develops.[22] Third, those regions which are primarily agricultural and which have less developed money economies will absorb a systematic downward bias, since their estimates of income rarely accurately record income in kind. The nature of the bias may vary with the level of national development as the Southern regions

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21. If it has not been made so already, we should make it clear that this study does not concern itself with patterns of regional concentration of income and population over the national development spectrum. Our concern will be with the regional dispersion of per capita income and labor force productivity. It should be noted that the two concepts of regional concentration and regional income per capita differentials need not converge. For example, in the case of 20th century France, it appears that concentration of industry, income, and population around Metropolitan Paris and surrounding areas has been consistent with *convergence* in regional income per capita levels. On the other hand, with the United States, "it is interesting to observe that the lower rate of spatial redistribution of various countrywide aggregates toward the second half of the period [1900/10-1960] is accompanied by *greater* reduction in inequality of income per capita among regions." Simon Kuznets, ***Population Redistribution and Economic Growth: United States, 1870-1950*** (Philadelphia, 1960), pp. 270-71. It would be extremely fruitful to examine this aspect of the problem more intensively.

22. It is interesting to note that for one country where allegedly adequate regional cost of living indices are available, Finland (1950), the use of those price indices produced little effect upon our estimates of regional inequality.

also become fully monetized and market oriented. Finally, the income accounting concept (not to mention serious reservations about the reliability of the data themselves!) varies considerably from country to country.[23] Puerto Rican regional development levels are measured by median income per family, Norwegian by assessed income per capita, Canadian by personal income per capita, German by net national product per capita, and so on. It can only be hoped that none of these limitations is serious enough to negate the striking patterns discovered in the data.

Table I presents the results of the international cross-section study. Statistics for these twenty-four nations were available to us, and they are grouped according to Kuznets' seven level-of-development classifications. These twenty-four include thirteen European, four "empty" overseas European, four Latin American, and three Asian nations. Regression analysis was not attempted for this portion of the study because of the difficulty of cardinal ranking of these countries by levels of development or income per capita. Column 2 indicates the years from which the measures of inequality were computed. The period covered over-all ranges from 1949 to 1961. Where data for a number of years were available (as in the case of Italy, Norway, and the United States, for example), they were utilized to more closely approximate an average decade estimate of regional inequality.

Columns 3 and 4 give a measure of the extent of the "North-South problem" within these nations at widely differing levels of development. Column 3, V_w, is a weighted coefficient of variation which measures the dispersion of the regional income per capita levels relative to the national average while each regional deviation is weighted by its share in the national population;[24] the higher the V_w, the greater the size of geographic income differentials. Column 4, V_{uw}, is much less useful for our purposes since it is unweighted and will be determined in part by the somewhat arbitrary political definition of regional units (the number of which varies considerably between countries: see footnote to Table 1). As a final word of caution preparatory to an examination of the results themselves, it should be noted that twenty of the twenty-four observations fall within groups I and IV or between "middle" and "high" income levels. This is indeed unfortunate, since it will not allow us to test significantly the hypothesis that V_w should rise, or in other words, that regional inequality should increase, during early stages of development. Furthermore, the sample does not include any of the communist East European nations, other than Yugoslavia, and this is a lamentable exclusion.

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23. This criticism does not hold for the United States county-state study or for the time series studies which follow this section. In the case of the time series studies, however, the number and nature of the regional units sometimes vary over time.

24. More precisely,

$$V_w = \frac{\sqrt{\sum_i (y_i - \bar{y})^2 \frac{f_i}{n}}}{\bar{y}},$$

where f_i = population of the i^{th} region,
n = national population,
y_i = "income per capita" of the i^{th} region,
$\bar{y}$ = national income per capita,

and $$V_{uw} = \frac{\sqrt{\frac{\sum_i (y_i - \bar{y})^2}{N}}}{\bar{y}},$$ where N = number of regions.

As a brief reading of the footnotes to Table I will suggest, this study utilizes a more detailed regional breakdown than usually appears in the literature. For example, we computed V_w from nineteen Italian regions rather than unnecessarily limit ourselves to the conventional separation into North, Central, and South.

TABLE 1.

International Cross-Section

Country and Kuznets group classification (1)	Years covered (2)	V_w (3)	V_{uw} (4)	M_w (5)	Size (square miles) (6)
Australia	1949/50-1959/60	.058	.078	4.77	2,974,581
New Zealand	1955	.063	.082	4.93	103,736
Canada	1950-61	.192	.259	17.30	3,845,774
United Kingdom	1959/60	.141	.156	11.39	94,279
United States	1950-61	.182	.189	16.56	3,022,387
Sweden	1950, '55, '61	.200	.168	15.52	173,378
Group I average		.139	.155	11.72	
Finland	1950, '54, '58	.331	.276	26.64	130,165
France	1954, '55/56, '58	.283	.215	20.80	212,659
West Germany	1950-55, '60	.205	.205	16.98	94,723
Netherlands	1950, '55, '58	.131	.128	12.45	12,850
Norway	1952, '57-'60	.309	.253	23.84	125,064
Group II average		.252	.215	20.14	
Ireland	1960	.268	.271	24.20	26,601
Chile	1958	.327	.440	30.65	286,397
Austria	1957	.225	.201	18.69	32,369
Puerto Rico	1960	.520	.378	42.31	3,435
Group III average		.335	.323	28.96	
Brazil	1950-59	.700	.654	53.78	3,288,050
Italy	1951, '55, '60	.360	.367	30.94	117,471
Spain	1955, '57	.415	.356	32.32	195,504
Colombia	1953	.541	.561	46.70	439,617
Greece	1954	.302	.295	26.56	51,246
Group IV average		.464	.447	38.06	
Yugoslavia	1956, '59, '60	.340	.444	24.54	95,558
Japan	1951-59	.244	.222	19.98	142,644
Group V average		.292	.333	22.26	
Philippines	1957	.556	.627	29.59	115,600
Group VI average		.556	.627	29.59	
India	1950/51, 1955/56	.275	.580	19.39	1,221,880
Group VII average		.275	.580	19.39	
Total average		.299	.309	23.78	

Table 1 (continued)

Definitions (see Appendix Tables for source descriptions and for a more extensive description of regional units):

(1) Australia, 1949/50—1959/60. Based on personal income per capita. Six regions: New South Wales (including Australian Capital Territory), Victoria, Queensland, South Australia (including Northern Territory), Western Australia, and Tasmania.

(2) New Zealand, 1955. Based on personal income per capita. Ten provincial districts and sectors: Auckland, Hawkes Bay, Taranaki, Wellington, Marlborough, Nelson, Westland, Canterbury, Otago, and Southland.

(3) Canada, 1950-1961. Based on personal income per capita. Eleven provinces: Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, and Yukon and Northwest Territories.

(4) United Kingdom, 1959/60. Based on total net assessed income per capita. Fifteen regions: nine English "Standard Regions," West Central Scotland, East Central Scotland, Highlands, Scottish Border Counties, Northern Ireland, and Wales.

(5) United States, 1950-61. Based on personal income per capita. 1950-54 V_w estimates are from Frank A. Hanna, *State Income Differentials, 1919-1954* (Durham: Duke University Press, 1959), p. 36, and V_{uw} was derived from Hanna's data (T-4, pp. 38-41); 1955-61, income per capita estimates are from various issues of the *Survey of Current Business*, and population estimates are taken from the *Statistical Abstract for the United States*. Nine regions based upon Bureau of Census groupings: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific.

(6) Sweden, 1951, 1955, 1961. Based on assessed income per capita. Twenty-four *lans* plus Stockholms *stad:* Stockholms *stad,* Stockholms *lan,* Uppsala, Södermanlands, Östergötlands, Jönköpings, Kronobergs, Kalmar, Gotlands, Blekinge, Kristianstads, Malmöhus, Hallands, Göteborgs o. Boh., Älvsborgs, Skaraborgs, Värmlands, Örebro, Vastmanlands, Kopparbergs, Gävleborgs, Västernorrlands, Jämtlands, Västerbottens, and Norrbottens.

(7) Finland, 1950, 1954, 1958. Based on declared income per capita. Twenty-three "economic regions" for 1950. Ten provinces for 1954, 1958: Undenmaan, Turun-Porin, Ahvenanmaa, Hämeen, Kymen, Mikkelin, Kuopion, Vaasan, Oulun, and Lapin.

(8) France, 1954, 1955/56, 1958. Based on disposable income per capita for 1954 and personal income per capita for 1955/56 and 1958. Twenty-one regions: Alsace, Aquitaine, Auvergne, Bourgogne, Bretagne, Centre, Champagne, Franche-Comté, Languedoc, Limousin, Lorraine, Midi-Pyrénées, Nord, Normandie (Basse), Normandie (Haute), Pays de la Loire, Picardie, Poitou-Charentes, Provence, Region parisienne, and Rhône-Alpes.

(9) West Germany, 1950-1955, 1960. Based on net product at factor cost per capita. Nine provinces of West Germany (excluding the Saar and Berlin): Schleswig-Holstein, Hamburg, Niedersachsen, Bremen, North Rhein-Westfalen, Hessen, Rheinland-Pfalz, Baden-Würtemburg, and Bayern.

(10) Netherlands, 1950, 1955, 1958. Based on net product at factor cost per capita. Eleven provinces: Groningen, Friesland, Drenthe, Overijssel, Gelderland, Utrecht, Noord-Holland, Zuid-Holland, Zeeland, Noord-Brabant, and Limburg.

(11) Norway, 1952, 1957-60. Based on assessed income per capita. Twenty counties: Østfold, Akershus, Oslo, Hedmark, Oppland, Buskerud, Vestfold, Telemark, Aust-Agder, Vest-Agder, Rogaland, Hordaland, Bergen, Sogn og Fjordane, Møre og Romsdal, Sør-Trøndelag, Nord-Trøndelag, Nordland, Troms, and Finnmark.

(12) Ireland, 1960. Based on earned income per capita. Twenty-six counties: Carlow, Dublin, Kildare, Kilkenny, Laoighis, Longford, Louth, Meath, Offaly, Westmeath, Wexford, Wicklow, Clare, Cork, Kerry, Limerick, Tipperary, Waterford, Galway, Leitrim, Mayo, Roscommon, Sligo, Cavan, Donegal, and Monaghan.

Table 1 (continued)

(13) Chile, 1958. Income concept not given in source. Nine regions: Tarapaca y Antofagasta, Atacama y Coquimbo, Aconcagua y Valparaiso, Santiago y O'Higgins, Colchagua y Curico y Talca y Mank y Linares, Ñuble y Concepcion y Arauco y Bio-Bio, Malleco y Cautin, Valdivia y Osorno y Llanquihue y Chiloé y Aysen, and Magallanes.

(14) Austria, 1957. Based on national income per capita. Nine provinces: Wien, Niederoesterreich, Oberoesterreich, Steiermark, Tirol, Kärnten, Salzburg, Voralberg, and Burgenland.

(15) Puerto Rico, 1960. Based on median family income. Income and population estimates are from the 1960 United States *Census of Population*, T-35 and T-37, pp. 116 and 117. Seventy-six *municipios*.

(16) Brazil, 1950-59. Based on national income per capita. Twenty-one states: Amazonas, Para, Maranhão, Piaui, Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, Bahia, Minas Gerais, Espirito Santo, Rio de Janeiro, Est. du Guanabara, São Paulo, Parana, Santa Catarina, Rio Grande do Sul, Mato Grosso, and Goias.

(17) Italy, 1951, 1955, 1960. Based on net national product per capita. Nineteen regions: Piemonte, Valle d'Aosta, Lombardia, Trentino-Alto Adige, Veneto, Friuli-Venezia G., Liguria, Emilia-Romagna, Toscana, Umbria, Marche, Lazio, Abruzzi e Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, and Sardegna.

(18) Spain, 1955, 1957. Based on national income per capita. Fifty provinces.

(19) Colombia, 1953. Income concept not clear in source: given as "income" per capita. Sixteen departments: Antioquia, Atlantico, Bolivar, Boyaca, Caldas, Cauca, Cordoba, Caudinamarca, Choco, Huila, Magdalena, Nariño, Norte de Santander, Santander, Tolima, and Valle.

(20) Greece, 1954. Based on national income per capita. Eleven regions: Sterea Hellas and Euboia, Macedonia, Aegean Islands, Pelopennesos, Cyclades, Thessaly, Crete, Dodecanesos, Thrace, Ionian Islands, and Epirus.

(21) Yugoslavia, 1956, 1960. Based on national income per capita. Six provinces in 1956: Serbia, Croatia, Slovenia, Bosnia and Hercegovina, Macedonia, and Montenegro. Eight provinces in 1960: Serbia is broken down into the sub-regions of Serbia Proper, Voyvodina, and Kosovo and Metohiya.

(22) Japan, 1951-59. Based on personal income per capita. Forty-six prefectures.

(23) Philippines, 1957. Based on personal income per family. Ten regions: Metropolitan Manila, Ilocos and Mt. Province, Cagayan Valley and Batanes, Central Luzon, Southern Luzon and Marinduque and Mindoro and Palawan, Bicol Province, Western Visayas, Eastern Visayas, South West Mindanao and Sulu, and North East Mindanao.

(24) India, 1950/51, 1955/56. Based on national income per capita. Eighteen states: Andhra, Assam, Bihar, Gujarat, Kerela, Madhya Pradesh, Madras, Maharashtra, Mysore, Orissa, Punjab, Rajasthan, Uttar Pradesh, West Bengal, Delhi, Himachal Pradesh, Manipur, and Tripura.

The results are quite striking. Our measure of regional inequality, V_w, ranges widely between a maximum of 0.700 for Brazil, a country with the most widely publicized North-South problem, and a minimum of 0.058 for Australia. If we examine the averages for each income class, the relationship between level of development and degree of regional inequality appears to be quite significant. The severity of the North-South problem seems to be quite minor indeed among the mature economies, although for any of these countries it may be politically significant. Group I has an average V_w of 0.139; but the degree of inequality increases sharply as we move from the high income to middle income group where the index of regional inequality measures 0.464, between three or four times that of the high income group. It is interesting to note that the middle income group contains both of those nations which are universally noted for their severe North-South schism, Brazil with its Nordeste, and Italy with its Mezzogiorno. As we move from Group IV to VII the evidence becomes thin, but we have only one exception, the Philippines, to the hypothesis that regional inequality should increase

in the early stages of growth. Both groups V and VII have average V_w's significantly less than the middle income class, and India appears to have the less serious regional income problem than the average of Yugoslavia and Japan. With one exception, it does appear that the pattern of regional inequality is in the form of an inverted "U," reaching a peak in the middle income class.[25] However, it should be pointed out that the evidence supporting a tendency towards increasing regional divergence from group VII to group IV is of a much weaker sort than that supporting the convergence stage from group IV to group I. Of the four observations falling between the low and middle income classes, three support the hypothesis, and two of these, Japan and India, *may* be unusually low relative to their income class averages. That is, Kuznets' indices of inequality based on industrial sectors reveal unusually low measures for both those nations relative to their respective income classes.[26]

The variation within each of these income classes is in some cases quite large and extremely interesting as well. Among the most developed nations, Canada, the United States, and Sweden, all have significantly more serious North-South problems than the average for income class I as a whole. With the exception of Australia, these three nations also have the largest land mass. The suggestion here is that geographic size may secondarily influence the degree of regional inequality; given the level of national development, the larger the geographic size of the national unit, the greater will be the degree of regional inequality. This could be explained by any number of factors that may already appear obvious to the reader; the greater the geographic size, the larger the scope for wide regional variations in natural resource endowment due to increased distance, both economic and cultural; the weaker the linkages between regions and the stronger the incidence of localism. The relatively low V_w's in New Zealand and the United Kingdom are both consistent with this notion, since their national borders encompass small geographic areas. Australia would appear to be an exception to this generalization, but even this conflict, large land mass but a minimum problem with regional inequality, can be explained by the arid nature of most of that continent; only the coastal areas are densely populated.

The same relationship appears to hold for less developed nations as well. In group II, both West Germany and the Netherlands have relatively low degrees of regional inequality for the postwar period, and both are significantly smaller in geographic size than the rest of the group. In group III, however, tiny Puerto Rico is a glaring exception to this generalization, although again Austria and Ireland with small land areas have low V_w, while Chile reveals a high incidence of regional dualism consistent with its large size. The evidence is equally strong among the middle income nations of group IV: Brazil and Colombia are both large relative to the rest of that group, and both have North-South problems more severe than that of the rest of the group. Greece, with a relatively low V_w, is less than half as large as the next biggest nation, Italy. No attempt was made to pursue this relationship further in groups V-VII, since the number of observations is obviously too small.[27]

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25. Using available national income per capita estimates [Hollis B. Chenery, "Patterns of Industrial Growth," *American Economic Review*, L (September 1960), Table 1, 632], the Spearman rank correlation coefficient is 0.721 for the nineteen nations in groups I-IV. These results are consistent with those of the only other cross-section study dealing with regional inequality with which we are familiar. The *Economic Survey of Europe in 1954* revealed an association between high national income per capita and low degrees of regional inequality (pp. 136-71).

26. Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations. VIII. Distribution of Income by Size," *Economic Development and Cultural Change*, XI, No. 2, Part II (January 1963), Appendix Table I, 70-71.

27. It should be clear that our "size" variable is very crude as a measure of interregional migration barriers and incidence of non-homogeneity within a nation. The Philippines is an excellent example of a country of moderate size but with tremendous natural barriers to migration; the nature of its geography

Although we have no way of evaluating the political importance of regional equality of income distribution to any one nation, it does seem strange that so many of these countries in our sample feel that their North-South problems are especially unique and severe. For instance, the French concern with "Paris and the French desert"[28] seems somewhat extravagant, given the size and level of development of that nation.[29] For that matter, Italy's highly popularized schism between North and South does not appear to be a severe case of regional dualism at all, given its income level. It should be made clear again, however, that we have made no attempt to measure regional concentration of population and urbanization, but only have measured regional variation in per capita income levels weighted by the distribution of population.

One more comment might be made before examining the *changes* in regional inequality during the postwar era. Recall that our weighted index of regional inequality, V_w, involves the squaring of the per capita income differentials. Although this is useful for the analysis of variance which appears in Section VIII, nevertheless it is conceivable that by squaring the differences we may be making our index unnecessarily sensitive to a few extreme deviations in regional per capita income. In order to check our results, we used an alternative statistic which sums the differentials to the first power signs disregarded.[30] This alternative measure, M_w, appears in column 5: M_w appears to produce significantly different results only in the case of the Philippines, where our alternative index of regional inequality is much more consistent with that country's level of development (see Table 1).

Table 2 presents us with some more information regarding the problem of regional inequality. There we have summarized the recent *changes* in geographic income differentials for those countries for which such short-term time series are available. Sixteen of the original twenty-four nations are classified according to the direction of change in V_w since the mid-late 1940's. What we hoped to find here were movements consistent with each country's position on the development spectrum. Divergence of regional income per capita levels should generally hold true for those countries below the middle income group, while convergence should be the case for those above the middle income range. That is, India at low levels of per capita income and regional disparity should exhibit increasing regional dualism and a rising V_w as

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may help explain its apparent high degree of regional inequality. Furthermore, severe regional dualism may in part be explained by historical accident. Yugoslavia's unusual history, which has produced such a high degree of ethnic, religious, and linguistic non-homogeneity, surely explains a large part of their contemporary problems with regional inequality.

28. This is J-F. Gravier's term. See his *Paris et le desert francais* (Paris: Le Portulan, 1947).

29. It should be emphasized again, however, that we are not referring to *absolute* regional differentials but relatives: sharp declines in percentage regional deviations from the national average may be quite consistent with increasing absolute gaps in regional income levels. Our own feeling is that the latter measure is not very helpful in understanding the inequality process; but, as Professor Benjamin Higgins has pointed out privately, if "the policy issue is how to reduce the gap in productivity and income between leading and lagging regions, the absolute gap between richest and poorest regions in the country may be more significant than [an] index of dispersion."

30. In this case,

$$M_w = \frac{\sum_i |y_i - \bar{y}| \frac{f_i}{n}}{\bar{y}} \times 100$$

where f_i = population of the i^{th} region,
n = national population,
y_i = "income per capita" of the i^{th} region,
$\bar{y}$ = national income per capita.

TABLE 2.

Secular Changes in V_w During The Postwar Period

Income class	V_w rising	V_w stable	V_w falling
I		Australia United Kingdom	Canada United States Sweden
II		France	Finland West Germany Netherlands Norway
III			
IV		Italy	Spain Brazil
V	Japan Yugoslavia		
VI			
VII	India		

Source: See Appendix and Table 4.

she proceeds through her early stages of modern development; the mature U. S. economy at high per capita income levels should be undergoing a further diminution in what is already a low degree of regional inequality and imbalance.

And indeed this is most strikingly the case: the nations in groups I and II exhibit either stability or a weakening in their North-South problems. Seven of the ten nations in these two groups underwent a decline in V_w. Those in the middle income group show a variety of change consistent with the pivotal nature of that level of development: Brazil underwent a decline from a "secular peak" in regional inequality, Italy exhibited stability in V_w at a high level, and Spain experienced regional convergence.[31] The remaining nations of the low income groups all reveal tendencies towards divergence in regional income levels.

We should note, at this stage of our discussion, that there is a significant amount of information for the currently underdeveloped nations which this study has not employed (either due to its unreliability or due to its non-quantitative nature). For example, there does exist some information which indicates the increasing problem of regional divergence in Pakistan's

31. Lasuen implies that Spanish experience has been just the opposite. He suggests that regional divergence has been the case for the past decade. *Op. cit.*, pp. 169-88 .

postwar development. The figures below are meant only to be suggestive, not conclusive, but they do stress regional divergence in growth rates between East and West Pakistan.[32]

Pakistan (per capita quantum indices)

	West Pakistan	East Pakistan	Pakistan
1951-52	100	100	100
1952-53	101	103	102
1953-54	107	115	111
1954-55	115	105	110
1955-56	114	91	103
1956-57	118	116	117
1957-58	124	109	117
1958-59	125	96	111
1959-60	128	112	120

At any rate, these short-term time series movements appear to be consistent with our international cross-section results.

IV. United States Cross-Section Analysis: 1950 and 1960

If we treat the states within American borders as nations themselves, and define *counties* as the regional unit, we ought to be able to perform an independent cross-section test. Using the median family income and population estimates which are enumerated in the United States census by county, we can then determine the degree of regional inequality that exists in each state at varying levels of per capita income and development. This test has a number of advantages over the internationsl cross-section analysis summarized above. First, the sample size is twice as large, since it includes forty-six states (see footnote to Table 3). Second, the sample has the advantage of utilizing both more reliable income and population data as well as more comparable income data, making a cardinal ranking of state income per capita and the use of regression analysis less objectionable. Third, the states themselves differ significantly from nations in terms of their control over economic activity. For this reason, any relationship between levels of state development and intercounty income differentials is more likely to be attributable to "natural" forces rather than governmental policy with regards to spatial inequality.[33]

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32. S. U. Khan, "A Measure of Economic Growth in East and in West Pakistan," *The Pakistan Development Review*, I, No. 2 (Autumn 1961), 51, Table II, and 50, Table 1. Furthermore, population redistribution has been in favor of West Pakistan during this decade.

33. This does not mean that governmental policy cannot appear as an important explanatory variable of intercounty income differentials. Each state *does* have some autonomy of control over economic activity, and, furthermore, the national government may itself influence intercounty income differentials via central government policies. As an example of the impact which state government may have over regional inequality, many of the currently industrializing Southern states are attempting to diversify their new industry spatially. The Mississippi Agricultural and Industrial Board has overtly given regional balance as one of its primary goals by "bringing industry to the people." That is, they have expressed an interest in spreading industrial projects evenly throughout the state, rather than further stimulating the flow of intrastate migration into the major urbanized counties.

At the same time, however, the data presents us with significant disadvantages. First, we have already mentioned that county income data is expressed, approximately, in terms of personal income (rather than "national" income) and per family (rather than per capita). The use of median income *per family* may introduce a significant bias if there are substantial state differences in rural-urban family size differentials. Thus, there *may* be a systematic bias which tends to minimize the observed size of intercounty income differences in the poor states. The second disadvantage is that the income range from poorest to richest state is much more narrow than that for our international cross-section. In particular, the U.S.'s poorest state, Mississippi, is significantly above the Kuznets middle income range, and for that reason alone we cannot expect to find evidence which would shed light on that part of the hypothesis which predicts rising inequality during early stages of economic growth. What we should find is that the more developed states in the Northeast and Midwest have very small intercounty differences in income levels relative to the lower income states.

The results of these tests for both 1950 and 1960 seem to throw added support behind our contentions concerning regional inequality. Table 3a summarizes the results by listing the computed regional inequality measures by state (where V_w is determined in precisely the same fashion as in Section III). For 1950, the range lies between a low degree of regional inequality for Connecticut, 0.0627, and a high V_w for Georgia, 0.3965. Table 3b aggregates this evidence into a summary table where the inverse relationship between levels of state development and regional inequality seems fairly clear. On the average, the eight lowest income states have a coefficient of intercounty inequality approximately two and one-half times that of the richest seven. The same pattern holds true for the 1960 data, where again severe interregional differentials are associated with relatively low levels of development.

Using simple univariate regression analysis, the inverse correlation between state income per capita and our index of interregional inequality is significant for both years:

$$[1950] \qquad V_w = 0.52792 - \underset{(0.000017)}{0.000131}\ Y_{pc}50, \qquad R = 0.760$$

$$[1960] \qquad V_w = 0.46791 - \underset{(0.000022)}{0.000139}\ Y_{pc}60, \qquad R = 0.687$$

This presents us with a second question: What role does state size play in determining the degree of regional inequality? At first blush, the results were definitely negative, and geographic size did not appear to be a significant determinant of intercounty income differentials. Geographic size is either a poor proxy variable for measuring, say, diversity of state resources, or the importance of that independent variable in the internationsl cross-section simply does not appear in a comparative analysis among American states. It is the former which seems to explain our poor results, since when we exclude the Mountain and Pacific states plus Texas, geographic size becomes a significant determinant of V_w.[34] The justification for this exclusion is approximately the same as our treatment of Australia in the international cross-section. For most, but certainly not all (e.g., California), of these states, large geographic size is not identical with varied resources or significant localism but with empty regions of semi-desert.

At any rate, for the states east of the Mississippi and on the Great Plains, size is a significant determinant of regional inequality. The higher the level of development and the

34. The states excluded here are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming.

smaller the state, the lower is the index of regional inequality:[35]

$$[1950] \qquad V_w = 0.4384 - \underset{(0.000019)}{0.000113}\ Y_{pc}^{50} + \underset{(0.000461)}{0.001205}\ S, \qquad R = 0.791$$

One more question remains to be answered. Has the pattern of change in intrastate inequality been consistent with each state's position on the development spectrum? Furthermore, is it consistent with the postwar experience of the United States with *interstate* inequality trends? Both of these questions may be answered in the affirmative. Column 4 of Table 3a exhibits the change in V_w for each state between the terminal years of the decade 1950-60. In only nine of the forty-six states did the size of regional inequality increase, and there appears to be no common factor among them: Iowa, Minnesota, Nebraska, North Dakota, Texas, and West Virginia are the major exceptions, while Massachusetts, North Carolina, and Pennsylvania exhibit minor increments in V_w over the decade. During a decade when regional inequality *among* the states was declining sharply (see Section V), regional inequality *within* the majority of the states was declining as well. And to repeat, these postwar movements are consistent with the fact that all of the U.S. states are above the middle income range and in relatively mature states of economic growth.

TABLE 3a.

United States Cross-Section, 1950 and 1960

State	V_w (1950)	V_w (1960)	ΔV_w	Y_{pc} (1950)	Geographic size (land area: 1,000 sq. miles)
(1)	(2)	(3)	(4)	(5)	(6)
Alabama	0.3529	0.280	-0.0729	1956	51.1
Arizona	0.1639	0.112	-0.0519	2375	113.6
Arkansas	0.3356	0.292	-0.0436	1315	52.7
California	0.1045	0.099	-0.0055	3021	156.7
Colorado	0.1659	0.163	-0.0029	2514	103.9
Connecticut	0.0627	0.053	-0.0097	3155	4.9
Florida	0.2171	0.147	-0.0701	1950	54.3
Georgia	0.3965	0.300	-0.0965	1649	58.5
Idaho	0.1378	0.121	-0.0168	2685	82.8
Illinois	0.1686	0.167	-0.0016	3163	55.9
Indiana	0.2005	0.136	-0.0645	2827	36.2
Iowa	0.1663	0.201	+0.0347	2612	56.0
Kansas	0.2389	0.211	-0.0279	2377	82.1
Kentucky	0.3908	0.352	-0.0388	1774	39.9
Louisiana	0.2916	0.267	-0.0246	1810	45.2
Maine	0.1269	0.110	-0.0169	2213	31.0
Maryland	0.2483	0.223	-0.0253	2811	9.9

35. It has been suggested that the number of regional units, counties, within each state may significantly affect our statistic of regional inequality. That is, the greater the number of counties within the state, everything else being equal, the larger the V_w. Given that state income per capita and the number of counties within the state are independent, then is it possible that our "size" variable does nothing more than reflect the impact of the number of counties upon state V_w? Interestingly enough, however, state size and number of counties are also independent of each other (Spearman rank correlation coefficient is 0.077).

Table 3a (continued)

(1)	(2)	(3)	(4)	(5)	(6)
Massachusetts	0.0854	0.092	+0.0066	2909	7.9
Michigan	0.1791	0.124	-0.0551	3195	57.0
Minnesota	0.1980	0.236	+0.0380	2683	80.0
Mississippi	0.3862	0.366	-0.0202	1028	47.2
Missouri	0.3622	0.301	-0.0612	2200	69.2
Montana	0.1686	0.146	-0.0226	2718	145.9
Nebraska	0.1617	0.238	+0.0763	2389	76.7
Nevada	0.1243	0.094	-0.0303	2982	109.8
New Hampshire	0.1067	0.056	-0.0507	2405	9.0
New Jersey	0.1440	0.110	-0.0340	3285	7.5
New Mexico	0.3293	0.227	-0.1023	2301	121.5
New York	0.1739	0.152	-0.0219	3055	47.9
North Carolina	0.2696	0.274	+0.0056	1864	49.1
North Dakota	0.1461	0.204	+0.0579	2446	70.1
Ohio	0.1599	0.120	-0.0399	3024	41.0
Oklahoma	0.3129	0.252	-0.0609	2050	69.0
Oregon	0.0921	0.077	-0.0151	2933	96.3
Pennsylvania	0.1339	0.138	+0.0041	2834	45.0
Rhode Island	0.1066	0.050	-0.0566	2650	1.1
South Carolina	0.3102	0.229	-0.0812	1647	30.3
South Dakota	0.3037	0.252	-0.0517	2337	76.5
Tennessee	0.3160	0.288	-0.0280	1749	41.8
Texas	0.1755	0.242	+0.0665	2273	263.5
Utah	0.1443	0.109	-0.0353	3001	82.3
Vermont	0.1135	0.094	-0.0195	2101	9.3
Washington	0.1351	0.112	-0.0231	2955	66.8
West Virginia	0.2181	0.230	+0.0119	2344	24.1
Wisconsin	0.2102	0.183	-0.0272	2860	54.7
Wyoming	0.1384	0.115	-0.0234	2964	97.5

TABLE 3b.

Income groups	Average V_w (1950)	Average V_w (1960)	No. of states in group
I	0.1367	0.114	7
II	0.1510	0.123	8
III	0.2000	0.179	8
IV	0.1585	0.159	7
V	0.2616	0.217	8
VI	0.3134	0.286	8

Source: Of the continental states, this group does not include Delaware, due to the small number of counties in that state (three), or Virginia, due to a unique method of regional classification (into urban units). The 1950 and 1960 median income per family and population data for counties are from Tables 36 and 35 in the 1950 and 1960 *United States Census of Population*, United States Department of Commerce, Bureau of the Census, "Detailed Characteristics by State." In some of these states a few counties are eliminated from the computations, since the Census does not estimate median family income if the population size is below a low minimum.

Table 3b (continued)

The cutoff points defining income groups in Table 3b are taken from Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations. VIII. Distribution of Income by Size," *Economic Development and Cultural Change*, XI, No. 2, Part II (January 1963), 75-77.

The state income per capita figures (Y_{pc}) are official government estimates and can be found in the *Survey of Current Business*.

V. The Historical Patterns: One

The question now arises as to whether the long-run historical experience of nations is consistent with our cross-section results. As the currently more mature national economies underwent the early process of economic development, did they experience first increasingly severe North-South dualism which eventually reached a peak and declined thereafter during their advanced stages of growth? Did the "empty" countries with ever-expanding frontiers trace out changing patterns of regional inequality quite different from those of the settled parent nations in Europe? [36] Does the experience of these nations with regional inequality appear to be one of a smooth trend, or is the degree of spatial inequality widely disturbed by such random factors as war, discovery, and political change?

The problems surrounding this methodological approach are immense, the most significant of which is the predictable lack of data necessary to extend a time series study for any nation back into its formative or adolescent years of economic development. Even where such regional population and income data are available, their reliability is usually very questionable. Although there may well be sources which we left untapped, we were able to find historical data for only ten nations which extended their experience with regional income differentials back for more than two decades. Our quantitative measures of regional inequality for these nations are presented in Table 4, and they cover the following periods: United States (1840-1961), United Kingdom (1937-59/60), France (1864-1958), Canada (1926-60), Netherlands (1938-58), Sweden (1920-61), Norway (1939-60), Italy (1928-60), Brazil (1939-59), and Germany (1900-60). Only six of these cover periods which extend back significantly before World War II, and of these six it would appear that only the United States, France, and Germany cover sufficiently long periods to encompass the three hypothesized stages of regional dualism (increasing, stable, and declining regional inequality), with Sweden and Italy dubious possibilities.

The first observation of interest might be the apparently consistent pattern of change in regional inequality between the 1930's and the immediate postwar period. With the predictable exceptions of Italy and Brazil,[37] each of these nations exhibit tremendous changes towards reduced regional disparity during that decade; all of them experienced significant convergence

36. Commenting on the hypothesized inverted "U" traced out by historical experience with secular income structure, Kuznets has said, "This long secular swing would be most pronounced for older countries where the dislocation effects of the earlier phases of modern economic growth were most conspicuous; but it might be found in the 'younger' countries like the United States...." With regard to spatial income distribution, this is apparently not the case for the "younger" Latin American nations. They have had historically more severe cases of regional dualism than that of the older European states such as Germany, France, and even Italy. However, it is clear that both Canada and the United States have not had as severe problems with regional income inequality as the Scandinavian and Continental European nations (excluding Germany: see immediately below and Sections III and VI). Simon Kuznets, "Economic Growth and Income Inequality," *American Economic Review*, XLV (March 1955), 1-28.

37. Italy and Brazil, of course, do not belong to the same high income groups as the other eight nations. The German series suffers from too much discontinuity between 1936 and 1950 to enable us to include it in the analysis which follows below.

in regional income levels. Surely a large part of the apparent lessening in regional inequality during this period can be explained by the unusually high levels of regional disparity reached by most nations during the 1930's. The "short-run" effects of the Great Depression were felt much more severely in the agricultural regions of each country, especially the United States and Canada, and a large part of the regional convergence in per capita incomes from the 1930's to the 1940's was due simply to a movement back to national full employment.[38] A good part of this convergence may also be explained by the war itself, which tended to strengthen secular forces towards convergence. How much of this apparent convergence is due to overt government policy and concern with regional inequality is debatable: no answer regarding causation is attempted at this stage.

Let us move on to the major question. What has been the long-term relationship between regional inequality and economic development?

In spite of the fact that the United States has undergone a growth experience somewhat unique among nations, being an "empty" country exhibiting unusual regional aspects in its development process, it traces out a "classic" pattern of regional inequality.[39] Column 1 in Table 4 presents regional inequality measures over time, but where the regional units are defined according to the Bureau of the Census (these include nine geographic units; see footnote to Table 4). The inequality index in column 1 exhibits a definite secular pattern over the whole development spectrum; during the early stages of growth, 1840-80, regional inequality increased or regional divergence was the rule; from 1880 to 1920, the degree of inequality stabilized and even revealed a significant decline; the 1920-60 experience has been varied, to be sure, but generally the evidence suggests a secular decline in the North-South problem, the rate of which has accelerated from the mid-1930's to the present.

It should be noted first that the tendency towards regional divergence, prevalent in our early and mid-19th century history, cannot be explained entirely by the Civil War and the bitter period of reconstruction which followed. Regional divergence was the case *prior* to the Civil War: the tendency towards increasing North-South dualism is evident, although not striking, between 1840 and 1860.[40] The sharpest increase in regional inequality does occur, however, between 1860 and 1880, a period covering both Civil War and Reconstruction.[41]

What can we say about the varied time pattern of American regional inequality between 1900 and 1940? The Great Depression temporarily halted the secular tendency towards a reduction in geographic income differentials because of the relatively severe effects of that period upon the agricultural regions in the United States; by 1940, we had recovered a relatively low degree of regional inequality which had been achieved by 1920. Indeed, Easterlin has shown us that when our data is adjusted by use of National Bureau reference cycle averages, the 1930's do not seriously interrupt the great secular decline in regional dualism which has persisted for almost eighty years.[42] Yet the 1920's still remain a significant exception.

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38. It has long been recognized among politicians and economists alike that national depressions or periods of stagnation have inequitable effects upon the distribution of income, and this is true, too, of the regional impact of such periods.

39. See Easterlin in *Trends (op. cit.)* for an extensive description of U. S. experience.

40. Nevertheless, it should be pointed out that if the American South is excluded from our regional measurement, regional inequality becomes very slight and, furthermore, the "classic" pattern all but disappears.

41. The estimates of regional income inequality for 1860 are not given here. See Richard A. Easterlin, "Regional Income Trends, 1840-1950," in Seymour Harris, ed., *American Economic History* (New York: McGraw-Hill, 1961), p. 528.

42. Easterlin in *Trends, op. cit.*, pp. 93-94.

This unusual decade in American history experienced regional divergence, contrary to the long-run trend towards convergence, and this was hardly a period of stagnation like the decade which followed.

The second column presents our measure of regional inequality where the regional units are the states themselves. This series, based upon smaller regional units, exhibits a higher measure of regional inequality throughout our 19th and 20th century history. The divergence, or increasing North-South dualism, from 1840 to 1880 is clear in both series, however, and the tendency towards increased regional inequality during the 1920's and 1930's is also pronounced in each. In both cases, the decline in regional inequality and tendency towards convergence has been most impressive during the twenty-five years, 1935-60, a period of active federal concern with regional dualism where public transfers to "depressed areas" has been most significant.

This so-called "classic" pattern also seems to hold for Swedish experience. The degree of regional inequality increased sharply during the decade of the 1920's, from 0.440 to 0.539 in 1930.[43] One could argue that this decade is the terminal one for the early and adolescent stage of Swedish growth. Although the period is admittedly short, we might then argue that the increasing regional inequality from 1920 to 1930 is entirely consistent with our hypothesis. This conclusion is strengthened by the high degree of inequality that *was* prevalent during this period of Swedish history (only the current middle-income nations have North-South problems as severe as that which Sweden experienced in the 1920's). It should be emphasized here that the trend towards increasing regional divergence is not the result of the dominating performance of a small sample of regions, but reflects consistent divergence throughout Sweden. With only two major exceptions, all of the counties below the national 1920 average suffered further decline during the decade. Although the Stockholm region was clearly the most dynamic *"pôle de croissance,"* all the highly developed Swedish areas show relative improvement, with the exception of Malmöhus län, which underwent a decline in relative income per capita (120.4 to 118.4 percent of the national average).

During the three decades following 1930, and during a period of mature development, Sweden has undergone a tremendous decline in regional dualism: V_w fell from 0.539 in 1930 to 0.192 in 1961. This aggregate pattern is again strikingly supported by individual performance; over these three decades each of the high income regions underwent a decline relative to the national average, while every Swedish region with a 1930 per capita income less than that of the national average exhibited a trend approaching that average.

Both Italy and Brazil also seem to have undergone experience with regional inequality consistent with our results thus far. Italian income data on a regional basis is available only from 1928. Our index of Italian regional inequality rises from a fairly high level in 1928, 0.313, to an average figure of 0.360 for 1950-60. Throughout the period 1928-60 it was Piemonte, Liguria, and Lombardia which were the leaders in the North, while in the postwar era both Lazio and Emilia-Romagna have joined them.

The decade pattern *within* the 1950's is confused, to be sure, but the relative stability of V_w between 1951 and 1960 suggests that Italy has reached a plateau with respect to her North-South problem. This would be consistent with her position on the development spectrum. For that matter, it is difficult to determine whether the sharp increase in V_w from 1938 to the early 1950's is part of a secular trend, peaking in the 1950's, or whether it is due in part to the disproportionate regional effects of World War II. While Piemonte, Liguria, Lombardia,

43. The year 1930 is not one of severe depression, and therefore our estimate of regional inequality should not be excessively biased by the effects of the Great Depression.

Lazio, and Emilia-Romagna enjoy increasing per capita income relatives during the period, they do so partly at the expense of Toscana, Friuli-Venezia Giulia, and Trentino-Alto Adige, which undergo relative declines. Furthermore, although all of the underdeveloped southern Italian regions find their relative positions slightly worsening, the most serious declines appear in Umbria, Basilicata, Calabria, and Sicily, which apparently suffered most severely from the war.

TABLE 4.

Time Series: Ten Nations

	United States	
	V_w (by region)	V_w (by state)
1840	0.231	0.279
1880	0.321	0.355
1900	0.299	0.322
1919		0.276
1920	0.291	0.331
1921		0.373
1929		0.369
1930	0.338	0.389
1931		0.395
1932		0.410
1933		0.394
1934		0.369
1935	0.310	0.337
1936		0.344
1937		0.326
1938		0.329
1939		0.331
1940	0.263	0.331
1941		0.306
1942		0.269
1943		0.258
1944		0.236
1945	0.211	0.227
1946		0.236
1947		0.226
1948		0.214
1949		0.212
1950	0.193	0.218
1951	0.194	0.213
1952	0.189	0.209
1953	0.191	0.212
1954	0.182	0.208
1955	0.182	0.207
1956	0.184	0.211
1957	0.184	0.208
1958	0.171	0.201
1959	0.172	0.196
1960	0.176	0.195
1961	0.167	0.192

Norway	
	V_w
1939	0.424
1947	0.253
1952	0.238
1957	0.233
1958	0.221
1959	0.209
1960	0.186

United Kingdom	
	V_w
1937	0.116
1949/50	0.074
1954/55	0.064
1959/60	0.071

Netherlands	
	V_w
1938	0.302
1946	0.151
1950	0.123
1955	0.142
1958	0.128

Sweden	
	V_w
1920	0.440
1930	0.539
1944	0.311
1950	0.229
1955	0.180
1961	0.192

Table 4 (continued)

France

	V_w (Taxable income per family)	V_w (Personal income per capita)
1864		0.260
1938	0.658	
1946	0.436	
1951		0.289
1954		0.245
1955/56		0.305
1958		0.299

Canada

	V_w
1926	0.176
1930	0.221
1935	0.237
1940	0.220
1945	0.189
1950	0.199
1955	0.192
1960	0.175

Italy

	V_w
1928	0.313
1938	0.345
1951	0.363
1952	0.384
1953	0.323
1954	0.331
1955	0.346
1956	0.348
1957	0.344
1958	0.348
1959	0.356
1960	0.372

Brazil

	V_w
1939	0.502
1947	0.693
1948	0.689
1949	0.713
1950	0.732
1951	0.725
1952	0.781
1953	0.703
1954	0.711
1955	0.692
1956	0.690
1957	0.665
1958	0.635
1959	0.663

Germany

	V_w, Old Empire	V_w, "New" W. Germany	V_w, "Old" W. Germany
1900	0.220		0.160
1907	0.242		0.177
1913	0.226		0.165
1926	0.181		0.132
1928	0.186		0.136
1932	0.176		0.128
1934	0.164		0.116
1936	0.196		0.148
1950		0.221	
1951		0.218	
1952		0.213	
1953		0.202	
1954		0.197	
1955		0.196	
1960		0.191	

Table 4 (continued)

Sources:

(1) United States. The first column, "by region," is computed by using nine regions as defined by Bureau of Census (see footnote to Table 1). V_w was computed from data in Richard A. Easterlin, "Interregional Differences in Per Capita Income, Population, and Total Income, 1840-1950," *Trends in the American Economy in the Nineteenth Century,* (Princeton: Princeton University Press, 1960), T-D-1 and T-D-2, 136-37 for the years 1840, 1900, 1920, 1940, and 1950. The years 1935 and 1945 are derived from Charles F. Swartz and Robert E. Graham, "Personal Income by States, 1929-54," *Survey of Current Business,* (September 1960). See footnote to Table 1 for sources of 1951-61 data. The second column, "by states," is from three sources: 1840, 1880, and 1900 are derived from Easterlin, *Trends,* T-A-1, pp. 97-104; 1919-54 are computed by Frank A. Hanna, *State Income Differentials, 1919-1954* (Durham: Duke University Press, 1959), T-3, p. 36; see footnote to Table 1 for sources of the 1955-61 data.

(2) Netherlands. See footnote to Table 1.

(3) Norway. See footnote to Table 1.

(4) Sweden. See footnote to Table 1 for the source of the data used to compute the figures for 1950, 1955, and 1961. For 1920, the income data is from the Statistiska Centralbyrån, *Folkrakningen den 31 December 1920,* IV (Stockholm, 1926), T-F, pp. 38-39, and the population data is from the same source, T-A, pp. 22-23. For 1930, the income data is from the Statistiska Centralbyrån, *Folkrakningen den 31 December 1930,* VIII (Stockholm, 1938), T-Ae, pp. 86-87, and the population data is derived from the same source, T-G, p. 16, and p. xv. See footnote to Table 1 for regional definitions.

(5) France. See footnote to Table 1 for regional classification and for sources of 1954, 1955/56, and 1958 data. The 1864 data is also from N. Delefortrie and J. Morice, *Les Revenus Départementaux en 1864 et en 1954,* Recherches sur L'Economie Francais, #1 (Paris, 1959), cols. 30 and 51, pp. 18-19 and 85-86, and is based on personal income per capita. The 1938 and 1946 taxable income per family data is taken from *Etudes et Conjuncture* (September 1949), T-8, pp. 83-84.

(6) United Kingdom. All these estimates are based on earned income per taxpayer. The 1937 figure is derived by a different regional breakdown than the later years: it includes thirty county groupings and excludes North Ireland. Colin Clark, "The Economic Function of a City," *Econometrica,* XXIII (April 1945), T-5, 104-05. The 1949/50, 1954/55, and 1959/60 estimates are based onearned income per taxpayer figures: for these years the "standard regional classification" is used (including North Ireland) and is from the *95th, 100th, and 105th Reports of the Commissioners of Her Majesty's Inland Revenue* (see footnote to Table 1).

(7) Canada. See footnote to Table 1.

(8) Brazil. See footnote to Table 1.

(9) Italy. See footnote to Table 1 for 1951-60 data. The regional units for 1928 and 1938 are the same as those for the postwar years: Svimez, *Un Secolo di Statistiche Italiane Nord e Sud, 1861-1961,* Capitolo XI (Roma, 1961), T-295, p. 770.

(10) Germany. See footnote to Table 1 for 1950-60 data and for description of regional units encompassed by West German border. Because of periodic changes in the national boundary, as well as in the nature of the regional units themselves, it would be impractical and not very meaningful to attempt to construct a continuous time series from 1900-60. The "Old" West Germany series includes Schleswig-Holstein, Hannover, Westfalen, Hessen-Nassau, Rheinprovinz, Bayern, Würtemberg, Baden, Hessen, Hamburg, Oldenberg, Braunschweig, Bremen, Lippe, and Schaumburg-Lippe (approximately 56 percent of total pre-war Germany in terms of income). The "Old Empire" series includes East Prussia, West Prussia and Posen, Berlin-Brandenburg, Pommern, Schlesein, Provinz Sachsen, Schleswig-Holstein, Hannover, Westfalen, Hessen-Nassau, Rheinprovinz, Sachsen, Würtemberg, Baden, and Hamburg. These income and population data (1900-36) are from the following sources: Statistichen Reichsamt, "Das deutsche

Table 4 (continued)

Volkseinkommen vor und nach dem Kriege," *Einzelschriften zur Statistik des Deutsches Reichs*, No. 24 (Berlin, 1932), Table 12, 15, and 16, pp. 72 and 76; Statistischen Reichsamt, *Wirtschaft und Statistik, Neunzehnter Jahrgang* (Berlin, 1936), p. 565; Statistischen Reichsamt, *Statistisches Jahrbuch für das Deutsche Reich* (Berlin, 1932), Table F-16, p. 525. There are also some scattered observations for the years 1854, 1875, and 1896, but the number of German regions was so limited no attempt was made to use them: see S. N. Procopovitch, "The Distribution of National Income," *Economic Journal*, XXXVI (March 1926), 69-82.

Hopefully for such institutions as the *Casa per il Mezzogiorno* and the spirit of the Vanoni Plan, the Italian North-South differential has at least seemingly stabilized during the postwar era, although the relative importance of public policy as the causative factor is almost impossible to isolate. This evidence on Italian regional dualism suggests optimistic projections regarding the future size of the North-South problem as Italy passes into mature stages of growth and rapidly ascends into high-income classes.

Brazilian experience is less encouraging. Divergence was the case from 1939 to the early-mid 1950's (or perhaps even from the drought of 1877-79), but, surprisingly, slight convergence has been the rule during the short period since. Brazilian regional income data may not be reliable enough to make strong conclusions from such short-term periods, but in any case it seems clear that the conditions which produced these two opposite trends are themselves quite different. From 1939 to 1952 the increase in our aggregate measure V_w is accompanied by consistent movements in the disaggregate; with very few exceptions, the advanced southern states increased their per capita income relatives, while the underdeveloped states to the North suffered relative declines. This consistency of pattern is less true of the recent period of declining V_w, 1952-60. Four of the five advanced regions did exhibit relative declines in income per capita, but in large part this was due to the extremely rapid development of Rio Grande do Sul. Among the poorer regions there was a considerable lack of conformity of movement. Most of the underdeveloped states showed only slight increases in their relative positions, while Espirito Santo, Mato Grosso, Amazonas, and Para underwent very severe declines. It appears, then, that the North Central suffered a considerable decline, while the North East gained only slightly. Thus the mild decline in V_w over this brief period is all the less encouraging, since it hardly represents a general trend towards convergence in state income per capita levels.

One might suggest that the inverted "U" traced out by Brazil's passage through the later years of her early development stage may be due entirely to governmental policy, on the one hand, and movements of the external terms of trade, on the other. We might also comment here that Brazilian concern with its North-South problem (explicitly revealed by the inauguration in 1959 of SUDENE by Kubitschek) is highly unusual relative to the historical experience of other nations. At similar levels of national income per capita and development, few countries have tended to devote increased attention to regional dualism at the expense of other national goals; yet the five year plan of SUDENE involves a heavy net transfer of funds from the Center-South to the Northeast as well as external aid from the United States.[44]

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44. See especially Hirschman's discussion in *Journeys Toward Progress: Studies of Economic Policy-Making in Latin America* (The Twentieth Century Fund, 1963); and Baer, *op. cit.*

Quantitative information on French historical experience with regional income inequality is very thin, and we shall discuss it only briefly here. We have one observation for 1864 (based on very suspect data), where V_w is computed as 0.260, while the next comparable observation is not available until *ninety* years later; in 1951, the coefficient of variation is 0.289. We would have predicted that French regional inequality increased significantly during its modern period of development after the mid-19th century.[45] We would also expect a period of convergence to have set in during her mature stage of growth long before the 1950's. The estimates of V_w for 1864 and 1951 are at least consistent with the notion.

If we utilize evidence which is less direct and which does not involve regional income data, we find strong support for the hypothesis that France has experienced the "classic" pattern of regional income distribution over the past one hundred years. In an excellent study of internal migration patterns, L. M. Goreux presents data which is extremely pertinent to our problem. Goreux computed coefficients of variation based upon the regional wages of agricultural laborers and also upon regional indices of agricultural production per male laborer. Although his measures of regional inequality are less universal than ours, since they are based only on the agricultural sector, they may still prove to be helpful.[46]

France

(V_w based on agricultural wages, including room and board, by department)

1862	0.285	1948	0.109
1882	0.303	1949	0.100
1892	0.368	1950	0.158
1929	0.225	1951	0.140
1938	0.201	1952	0.160
1947	0.095	1953	0.160

(V_w based on agricultural product per male agricultural laborer by department)

1882	0.427
1910	0.406
1929	0.391
1948	0.342

45. The lone observation for 1864 does suggest a contradiction of the popular view among European economic historians that France was typified by "polarization" and regional inequity long before her industrial revolution, since the computed V_w of 0.260 for 1864 does not indicate severe dualism. Regional concentration may still, of course, have been the case.

46. These figures are from Goreux, *op. cit.*, pp. 331 and 343, respectively. The observations are weighted by the distribution of the agricultural labor force by department. Given the information which follows in section IX, a true estimate of V_w based upon regional *income* inequality would be somewhat lower in level but similar in movement to those estimated by Goreux based only upon conditions in the agricultural sector.

If this data can be interpreted without qualification, then it suggests that regional inequality became increasingly severe from the 1860's to World War I. Thereafter, secular convergence appears to have been the rule, excluding the temporary interruption of World War II and reconstruction. This pattern is not only consistent with the experience of other presently developed nations, but it is extremely similar with the time path of German regional distribution (see below).

Canada does not reveal any significant trend towards either divergence or convergence during the thirty-five year period, 1926-60, for which regional income data are available. Given Canada's size and relative immaturity compared with the United States, V_w was surprisingly low in the 1920's, and the index of regional inequality for 1960 was almost precisely that of 1926. Recognizing that the increasing level of V_w to the 1930's simply reflects the effects of the depression on the Prairie provinces and that the decline in V_w thereafter reflects a reversal of those conditions, the Canadian case remains a curious one still. If we artificially separate the period into 1926-35 and 1935-60, the disparate patterns become striking. In the earlier period, the "backward" eastern provinces show a mixed performance, with New Brunswick and Prince Edward Island just barely maintaining their relative income per capita positions, while Nova Scotia and Quebec reveal an impressive improvement. The severe effects of the depression upon the Prairie provinces, however, dominates our aggregate measure (e.g., Saskatchewan declines from 102.4 to 63.1 percent of the national average), and increasing inequality is the general rule. The same lack of consistency among the underdeveloped regions appears in the latter period as well. The Prairie provinces undergo impressive improvement, while the Maritime provinces just barely hold their own and Quebec suffers a significant decline. In summary, apart from the interlude of the 1930's, stability in V_w has been the rule, with Quebec and the Maritime provinces barely maintaining growth rates equivalent to those of Ontario and British Columbia, while the Prairie provinces reveal extreme instability producing fluctuations around the national average. We will say more about Canadian experience and its dissimilarity with U.S. history in the next section.

The German data does not cover the largest portion of her earlier stages of modern development, but begins only with 1900. Generally, V_w did experience a minor increase during the decade and a half prior to World War I. Our hypothesis would suggest that this period would be a terminal one following four decades of development and concomitant regional divergence. This seems extremely unlikely, given the low level of regional inequality which existed in 1900 (less than or equal to the V_w's of those nations currently in Kuznets' income class II). Furthermore, the mild increase in V_w prior to World War I does not describe a period in which all the developed states are growing at rates exceeding the national average. Only Berlin-Brandenberg shows a significant improvement in relative income per capita, while Hamburg, Hessen-Nassau, Rhein province, and Saxony all reveal stability. Nevertheless, regional inequality declined fairly consistently from 1907 to the mid-1930's. The puzzling phenomena is not so much the *time pattern* of German regional inequality, but its low *level* throughout the period 1900-60. None of the other European countries appears to have had similar experience with geographic income differentials. It is interesting to note that German experience with *size* distribution of income is strikingly similar to what we have already described as her experience with regional inequality. Kuznets' estimates of German size distribution reveal fairly low indices of concentration during the late 19th and early 20th centuries compared with other nations at similar stages of development. Furthermore, it appears that Germany underwent increasing inequality of size distribution up to the period 1896-1912.[47]

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47. Kuznets, "Quantitative Aspects of the Economic Growth of Nations. VIII. Distribution of Income by Size," *op. cit.*, Table 16, pp. 60-62.

With the exception of Germany and perhaps Canada, what slim historical evidence we do have seems to be at least consistent with the results of our cross-section analysis.[48]

It would be of major interest to us to know more about the experience of planned economies with regional inequality, although any comparative study involving the East European or Soviet economies would involve questionable indirect evidence and conjecture. It seems highly unlikely that the Communist nations have sacrificed rapid national growth for the "secondary" Marxian goals of (1) introducing industrialization throughout the country in order to achieve the necessary conditions for socialism on a nationwide scale and (2) achieving idealistic equalitarianism implied by the socialist society.[49] In the case of Poland, what little evidence we have concerning regional resource-allocation suggests that goals of reducing regional dualism have been subordinated to national development goals, and that increasing regional divergence has been the case in the postwar period of early industrialization. It appears that Poland has been concentrating her incremental resources in the Upper Silesian Industrial District.[50] Furthermore, now that Soviet Russia has reached a relatively mature stage of growth (equivalent to the middle-income nations or higher), has that nation undergone any tendency towards convergence in regional development levels and reduction in regional dualism? It may turn out that Russia, given its size and income level prior to World War II, actually did not undergo as sharp a movement in regional divergence as, say, Brazil. This seems a likely supposition, given Russian difficulties with inland transportation during the 1930's and increasing stress upon regional self-sufficiency, as well as the military insistence upon regional decentralization. Whatever the case, we do know that the Seven Year Plan in 1959 included in it significant regional goals, and also the 1956 movement toward decentralization itself may imply a serious attempt to reduce regional inequities generated by the fabulous growth of three decades. Finally, we have already seen that in spite of official pronouncements and alleged effort, Yugoslavia underwent increasing regional divergence between 1956 and 1960 (see Appendix and Table 2).

VI. The Historical Patterns: Two

We did attempt to extend our historical evidence by the substitution of a variable which would approximate regional income per capita or level of development. By using this very imperfect substitute, the share of agricultural laborers in the total labor force by regions, we were able to lengthen considerably our time series for Canada, Italy, and Brazil. We derived

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48. Quantitative evidence describing this aspect of British economic history is not available. However, Arthur Redford in his classic study on British 19th century interregional migration suggests that the development of Great Britain's industrial centers in the first part of that century tended to increase regional dispersion in wage rates. Arthur Redford, *Labour Migration in England, 1800-50* (Manchester: Manchester University Press, 1926), and see Goreux's comments in *op. cit.*, p. 343. Commenting on Spanish experience with regional development, Lasuen implies that regional divergence was initiated with the early development of the heavy metal industries in the Bilbao area and the textile industries in the Barcelona area, both of which began their regional development almost fifty years ago. Furthermore, secular divergence may still be the case, for "although a little spreading has taken place (mainly around Barcelona, less so around Bilbao) the backwash effects are probably stronger than ever." With regard to the last phrase, we have already expressed some disagreement (see section III). Lasuen, *op. cit.*, p. 177.

49. Dziewonski, *op. cit.*, p. 45.

50. *Ibid.*, pp. 43-57.

a rough index of regional inequality by using the square of the differences between regional shares of agricultural employment in the labor force (hereafter termed A/L) and that of the nation as a whole.[51]

A glance at Table 5a gives an idea of just how imperfect, as an approximation of income per capita, A/L is in computing inequality indices. In this limited cross-section sample, the rank correlation (Spearman's coefficient) between our V_w based on income per capita, and Δ_w based on A/L, is hardly very impressive: $r = 0.576$, and when the major offender, Brazil, is eliminated, $r = 0.758$. Although A/L may be a poor substitute as a measure of regional income inequality, this should not imply at the same time that the correlation between A/L and income per capita is poor between regions and *within* nations. On the contrary, for all nations which have such data available, regional income per capita and the A/L share revealed highly significant inverse correlations similar to the results of the Chenery-Kuznets-Clark *international* cross-sectional studies.[52] Nevertheless, the slope of the function estimating the relationship between regional A/L and income per capita varies considerably between countries. In the cases of Finland and Austria, the regional variations in A/L are much more wide than those of income per capita compared with such nations as Brazil, Italy, and Sweden. To put it in another way, for some nations (most notably Brazil) regional disparities in agricultural productivity are almost as important as the regional role of manufacturing employment in explaining geographic differences in income per capita levels.[53]

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51. More precisely, this index of regional inequality, Δ_w, is the following:

$$\Delta_w = \sqrt{\sum_i [(A/L)_i - (A/L)]^2 \cdot \frac{f_i}{n}} \times 100$$

where $(A/L)_i$ = share of agricultural labor in total labor force of i^{th} region,
(A/L) = share for the nation as a whole,
f_i = population of the i^{th} region,
n = national population.

52. Assuming a simple linear relationship of the form

$$\frac{A}{L} = \beta_0 + \beta_1 Y$$

where $\frac{A}{L}$ is the proportion of the labor force employed in agriculture in each region, and Y is the income per capita of each region, we get the following results:

Country	No. Regions	$\hat{\beta}_1$
Great Britain	10	-0.1587 (0.0495)
Austria	9	-0.7071 (0.0546)
Sweden	25	-0.0266 (0.0029)
Brazil	20	-0.2126 (0.0675)
Italy	16	-0.4024 (0.0514)
Canada	9	-0.3272 (0.0571)
Finland	23	-0.8514 (0.0569)

53. The $\hat{\beta}$ coefficients above do not precisely show this. It would appear that Sweden and Great Britain exhibit even less variation in A/L relative to income per capita variation than Brazil. Clearly, the absolute importance of the agricultural sector is small for all regions in Sweden and Great Britain, while this is not the case for Brazil. This interesting topic is pursued further in Section IX.

TABLE 5a.

Index of Regional Inequality Using Agricultural Labor Force As a Share in Total Labor Force: Cross-Section

Country	Year	V_w (using Y_{pc})	Δ_w (using A/L)
Italy	1951	0.363	14.22
Brazil	1950	0.732	13.10
Canada	1951	0.192	10.19
Finland	1950	0.331	23.20
Great Britain	1951	0.141	5.31
Austria	1957	0.225	15.55
Spain	1957	0.387	22.69
United States	1950	0.218	9.46
Japan	1959	0.259	16.59
Sweden	1940		14.12
	1944	0.311	

TABLE 5b.

Time Series For Canada, Italy, and Brazil: Δ_w

Canada		Italy		Brazil	
1901	7.14	1861	6.55	1920	7.76
1911	9.88	1871	7.88	1940	8.20
1921	12.35	1881	6.76	1950	13.10
1931	12.68	1901	7.84		
1941	12.60	1911	9.41		
1951	10.19	1921	10.94		
		1931	12.14		
		1936	12.72		
		1951	14.22		

Source of labor force data:

(1) Brazil. *The Development of Brazil,* Joint Brazil-United States Economic Development Committee (Washington, D.C., 1953), Tables VIII and XI, pp. 291-92.
(2) Italy. Svimez, *Cento Anni Di Statistiche Sulle Regioni D'Italia* (Rome,. 1961), Table 10, pp. 18-22.
(3) Canada. Dominion Bureau of Statistics, *Census of Canada, 1951* (Ottawa, 1953), Vol. IV, Table 2, and Vol. 1, Table 1.

Table 5b (continued) Table 5b (continued)

(4) Spain. Banco de Bilbao, *Renta Nacional de España y su Distribucion Provincial, 1957* (Bilbao, 1958), pp. 46-47.
(5) United States. *U. S. Census of Population, 1950* Vol. II, Part I, Table 83.
(6) Japan. See footnote to Table 1.
(7) Austria. "Die Verteilung des Volkseinkommens nach Bundesländern," *Monatsberichte des Oesterreichischen Institutes für Wirtschaftsforschung,* Supplement No. 60 (December 1959), Table 15, p. 17.
(8) Finland. Lars Wahlbeck, *Om Inkomstniväns Geografi i Finland är 1950,* II, Ekonomi och Samhalle, Skrifter utgivna av Svenska Handelskogskolan, No. 2 (Helsingfors: Soderstrom and Co., 1955), Table 11, pp. 576-77.
(9) Sweden. Statistiska Centralbyrån, *Statistisk Arsbok för Sverige, 1945* (Stockholm, 1945), Table 27, pp. 36-37.
(10) Great Britain. *Census of England and Wales, 1941,* Occupational Tables (London: Her Majesty's Stationary Office, 1956), Table 20, pp. 152-67.

In spite of these qualifications, we did make use of the A/L index, Δ_w, to extend our quantifiable historical series backwards for the three nations exhibited in Table 5b. It is interesting to note that Brazil *had* been undergoing divergence in regional income levels for two decades prior to 1940, while the most violent increase in regional dualism occurred during her modern era of industrialization, 1940-50 (the data for the decade 1950-60 was not available to us). This again appears to support our hypothesis. The use of A/L data also helps solve some of the mystery surrounding Canadian historical experience: Δ_w increased rapidly during a very impressive period of Canadian growth, from 1901 to World War I (or more accurately, to 1921).[54] Stability in regional inequality was indeed the case from 1921 to 1941, and the decline since World War II does appear to be part of a secular trend, rather than a short-term movement. Finally, the movement of Δ_w in Italy from unification to the modern postwar era seems consistent with the "classic" relationship between regional inequality and national development. There is only a mild increase in regional dualism from unification to the turn of the century: Δ_w increases from a low level in 1861, 6.55, to 7.84 by 1901. The rapid increase in regional inequality occurs during the first really impressive period of modern Italian growth from the late 19th century to World War I. Incidentally, if we heroically assume that North-South differentials in labor productivity were the same in Italy in 1861 as in the United States in 1950, it would appear that the North-South problem was less serious in Italy at the turn of the century. Keeping in mind the restrictiveness of our assumptions concerning productivity, it would seem that there is a great deal of truth to the contention that serious Italian regionalism was not inherited at the time of unification, nor was it significantly increased by governmental policy during the last four decades of the 19th century.[55] Whatever the case, Δ_w increased continually after 1921, but at a slower rate. All of this appears to be consistent with our qualitative evidence concerning Italian regional development during the national growth process.

VII. Measurement: Economic Significance or Political Reality?

There are a number of alternative statistical measures one can use for determining the extent of regional inequality and its change over time. The preference for an unweighted index over a weighted one, we think, is indefensible. The choice of an index which squares

54. It might prove fruitful to examine the nature of the tremendous inflow of foreign capital and labor into Canada during the period to learn more about the impact of those factor imports upon regional inequality.

55. See, for instance, Eckaus, *op. cit.*

regional deviations about the national mean is less clear. In an earlier section we defended our use of the former, since it was helpful in analysis of variance which we pursued elsewhere in the research; in any case, the behavior of M_w and V_w is so similar in both cross-section and time series that the discussion becomes academic. More serious is the choice of our measure of regional levels of development in computing aggregate indices of regional inequality. Although an index which is based upon regional income per capita relatives may have more meaning in understanding the process of regional inequality over the development spectrum, it may not be *politically* meaningful. It is quite possible and hardly uncommon that a period of convergence in regional income per capita *relative to a national average* may at the same time be one of increasing absolute differentials. An index based on the former will be determined by regional growth differentials; one based on the latter will be influenced by a mixture of regional growth rate differentials and initial absolute differentials.

If political decision-makers are indeed motivated by absolute differentials in regional income, then a comparison of our index computed from income relatives with that computed from absolute differentials might be helpful. The empirical evidence below compares the movement in M_w, a weighted mean deviation based upon income relatives, and in M_w^a, a weighted mean deviation based upon absolute income differentials.[56] To illustrate the divergent movements we have used the recent experience of the United States, Canada, Sweden, and Italy as examples.

Comparative Behavior of M_w and M_w^a

	United States			Canada	
	M_w	M_w^a		M_w	M_w^a
1951	17.6	263.7	1950	17.8	169.3
1955	17.0	281.2	1955	17.2	175.8
1961	14.8	264.4	1960	15.5	169.2
	Italy			Sweden	
	M_w	M_w^a		M_w	M_w^a
1951	30.3	519.4	1950	17.7	617.3
1955	30.1	610.2	1955	14.0	576.8
1960	32.4	846.7	1961	14.9	671.3

Source: See Tables 1 and 2.

56. To be more precise,

$$M_w^a = \frac{\Sigma_i |y_i - \bar{y}| \frac{f_i}{n}}{P}$$

where y_i = income per capita of the i^{th} region,
$\bar{y}$ = national income per capita,
n = national population,
f_i = population of the i^{th} region,
P = index of the general price level.

It should be emphasized that M_w^a cannot be used for between-country comparisons, since money incomes are deflated only by a general national price index—they have not been converted into common currency units.

As the reader can verify by looking at the accompanying table, although the United States and Canada have both recently undergone considerable convergence in regional income per capita relatives, neither have had any success in reducing absolute differentials between regions. The poorer regions have managed to grow at rates so much higher than the richer ones, however, that absolute differentials have stabilized. Given that in 1951, for instance, the Northeastern region of the United States had a per capita income level half again as large as that of the South, the stability in the absolute differential represents quite a considerable effort. The same description appears to hold for Sweden as well. Given much higher initial regional differentials for Italy, the divergence between M_w and M_w^a is much sharper. Although Italian regional inequality based on income relatives declined slightly between 1951 and 1955, absolute income per capita differentials increased sharply.

To summarize this brief section, we have tried to show that, to have any economic meaning and to be useful in explaining the behavior of this aspect of the growth process, an analysis of regional inequality and geographic dualism must be based upon income relatives and thus upon growth rate differentials. We recognize that absolute income differentials may have more political meaning, but to expect that the regional convergence typical of national maturity will also produce reductions in these absolute differentials is to expect a great deal indeed. Thus it would be folly to assume that the strain of economic development upon regional dualism will lessen as the young nation moves into self-sustained growth or into income class IV, for even the highly integrated American economy, with its trend towards regional convergence, has not been able to reduce the *absolute* gap between North and South.

VIII. Population Redistribution versus Income Growth

Recall that our index of regional inequality has two components. First, the index is an aggregate measure of the dispersion of regional levels of per capita income (or A/L) about the national mean. Second, each regional observation is weighted by its importance, that is, by its share in the national population. The question therefore arises of the relative contribution of changes in regional per capita income over time versus the contribution of population redistribution in producing these historical variations in V_w. Is it differentials in regional per capita income growth which generally dominate our measure of regional inequality, or does population redistribution and changing regional population weights play a significant role?

It should be made clear immediately what we do *not* intend to investigate here. It should be obvious that internal migration may have significant effects on the regional distribution of the national population over time. But internal migration also should effect wages and income per capita in both the sending and receiving region. In this section, we are implicitly assuming that population redistribution has *no* causative effect upon income per capita in the regions themselves. Our goal is therefore a much more limited one. We are asking whether changes in regional population weights over time (due either to differential natural rates of growth, internal migration, or external migration) significantly effect the historical pattern of V_w in the course of national development.

To measure the relative importance of population redistribution versus income growth we have used analysis of variance.[57] Changes in the weighted variance of regional income per capita about the national mean can be artificially decomposed into three separate components: changes in variance due to shifting population weights, changes in variance due to divergent regional income per capita growth, and, an indefinable component necessary to preserve

57. We would like to thank Alfred Conrad for the suggestions he made pertaining to this measurement problem.

additivity, changes in variance due to the interaction of both income and population change.[58] The results of these computations are given in Table 6. Ten countries were examined for different time periods in their growth experience, and in three cases the A/L data was used in addition to the income data.

In Table 6 each of these three components is given as a percentage of the change in total variance. Using Italy as an example, and using the available income data, during the period 1951-60, 29.0 percent of the change in total regional variation appears to be due to population redistribution or changes in regional population weights. This turns out to be an unusual case, since the historical experience of most nations has been that population redistribution has a relatively insignificant effect upon changes in regional inequality of income distribution. Indeed, in the twenty-one cases exhibited in Table 6, nine show that changes in variance due to population redistribution acted in a fashion opposite to that of changes in total variance.[59] For that matter, only seven of the twenty-one cases exhibit population redistribution playing a significant role; but in only one case, India, does population redistribution dominate changes in total variation. In all other cases disparity in regional per capita income growth is the major explanation of variations in V_w, regional income inequality.

To repeat, no inference should be drawn concerning the effect of internal labor migration upon regional inequality, since we would expect labor migration to effect income per capita levels as well as to change regional population weights.

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58. Between two time periods $t = 0$ and $t = 1$, the increase or decrease in total regional variance can be decomposed in the following fashion:

$$\sum_i (y_i^1 - \bar{y}^1)^2 f_i^1 - \sum_i (y_i^0 - \bar{y}^0)^2 f_i^0 = \sum_i (y_i^0 - \bar{y}^0)^2 (f_i^1 - f_i^0) + \sum_i f_i^0 [(y_i^1 - \bar{y}^1)^2 - (y_i^0 - \bar{y}^0)^2] + \sum_i (f_i^1 - f_i^0)[(y_i^1 - \bar{y}^1)^2 - (y_i^0 - \bar{y}^0)^2]$$

where y_i^1 is the income per capita of the i^{th} region in $t = 1$

$\bar{y}^0$ is the income per capita of the nation in $t = 0$

f_i^1 is the share of the i^{th} region's population in the population for $t = 1$

Obviously what we have done was to fix regional income differentials at levels existing in the initial period and then allowed the population weights to vary; similarly, we fixed population weights at those of the initial period and then allowed variations in regional income growth to occur; finally, both were then allowed to vary over the time period. These three components should then sum up to total change in regional variation between $t = 0$ and $t = 1$ computed independently.

59. For example, Italian experience between 1901 and 1936 was such that population redistribution tended to ***diminish*** regional inequality while the measure of total regional inequality ***increased***. The eight other cases are Canada (1926-33), Brazil (1952-59 and 1920-50), France (1864-1954), Germany (1907-36), Sweden (1944-61), Norway (1939-60), and the United States (1880-1920). There is no consistency, furthermore, with regard to where these time periods fall on the inverted "U": for Brazil it is during a period of rising regional inequality, for Sweden a period of declining inequality, and for the United States a period of relative stability.

TABLE 6.

Decomposition of Variance: Population Versus Income Growth for Ten National Time Series

Country	Absolute variance (1)	% variance[e] (2)	Absolute variance (3)	% variance (4)	Absolute variance (5)	% variance (6)
	1951-60					
Italy	18.7992[a]	29.0				
(Income)	44.7204[b]	68.9				
	1.4048[c]	2.2				
	64.9244[d]					
	1861-1901		1901-36			
Italy	1.9874	3.7	- 2.5432	- 0.5		
(A/L)	58.7439	109.0	517.3368	100.3		
	- 6.8552	- 12.7	1.2250	0.2		
	53.8761		516.0186			
	1926-33		1933-48		1951-61	
Canada	- 7.567	- 1.8	- 48.650	10.7	-10.396	11.5
(Income)	427.991	100.6	-462.201	101.4	-82.146	91.2
	5.180	1.2	54.895	- 12.0	2.463	- 2.7
	425.604		-455.956		-90.079	
	1911-31					
Canada	87.34	9.9				
(A/L)	695.69	78.8				
	99.92	11.3				
	882.95					
	1939-52		1952-59			
Brazil	98.440	2.8	140.111	- 8.2		
(Income)	3,311.903	92.6	-1,790.994	105.1		
	166.642	4.7	- 51.792	3.0		
	3,576.985		-1,702.675			
	1920-50					
Brazil	- 1.6390	- 2.1				
(A/L)	77.9969	99.5				
	2.0165	2.6				
	78.3744					
	1864-1954					
France	477.9323	-613.7				
(Income)	-273.7338	351.5				
	-282.0777	362.2				
	- 77.8792					

Table 6 (continued)

	1949/50-59/60	
Australia	0.1064	0.7
(Income)	14.4680	99.9
	- 0.0889	- 0.6
	14.4855	

	1907-36		1950-60	
Germany	6.8119	- 3.3	- 1.4930	1.2
(Income)	-196.3604	96.4	-122.3828	100.9
	- 14.0842	6.9	2.6185	- 2.2
	-203.6327		-121.2573	

	1944-61	
Sweden	52.4709	- 8.7
(Income)	-614.6234	103.0
	- 34.6402	5.8
	-596.7927	

	1939-60	
Norway	68.3723	- 8.1
(Income)	-931.9665	109.8
	14.8386	- 1.7
	-848.7556	

	1930-61	
United -	47.0053	4.2
States	-1,107.2758	98.8
(Income by state)	34.1195	- 3.0
	-1,120.1616	

	1840-60		1880-1920		1920-30	
United	12.972	12.1	315.58	- 44.0	22.81	7.8
States	175.930	164.7	-668.24	93.2	277.41	94.9
(Income by region)	- 82.067	- 76.8	-364.45	50.8	- 8.05	- 2.8
	106.835		-717.11		292.17	

	1950/51-60/61	
India	465.41	50.8
(Income)	204.92	22.4
	245.81	26.8
	916.14	

a. Variance attributable to population redistribution.

b. Variance attributable to income per capita (or A/L) changes.

c. Variance attributable to both population and income changes. See text.

d. Total variance.

e. This column gives a, b, and c as a percentage of d.

Table 6 (continued)

Note: The data used in deriving the variance estimates above are taken from the same sources as indicated in earlier tables. The reader will note further that in three cases A/L has been used as the "income" variable. Finally, the regional units underlying the estimates in this table are those used in Table 1.

IX. Regional Labor Participation and Sectoral Distribution

This section involves two additional steps which attempt to increase further our understanding of the relationship between regional inequality and economic development. The first attempts to isolate the role of regional variations in labor participation rates and their contribution to spatial differences in income per capita levels. Given significant geographic income per capita differentials, one would anticipate high rates of participation in the rich North and low rates in the South for much the same reasons that labor participation rates tend to be relatively low in low-income countries.[60] The question then arises, how much of these observed regional inequalities are explained by productivity differentials and how much by participation rates?

Column 7 in Table 7 throws some light on this question. Here we have a small sample of thirteen countries. Column 3 exhibits the computed index of inequality using regional income per capita and weighting by regional population shares. Column 4 presents a different index of inequality based on labor productivity: this index measures regional variation in income (or product) per worker, and each regional variation is weighted by regional labor force shares in the national labor force.[61] Column 7 is simply a ratio of the inequality index based on income per capita to that which is based on labor productivity. At a variety of national development levels and in all cases but two, Japan and the United States (1900), the inequality index is lower when computed from regional productivity data. Labor participation rates appear to play a significant role in explaining regional dualism at all levels of national development.

We might interject the remark that the positive correlation between income levels and labor participation rates tends to be stronger between regions within national boundaries than between nations themselves (two exceptions are discussed below). Furthermore, the range of variation in regional labor participation rates is apparently greater than between nations. Using Kuznets' post-war data,[62] the range in labor participation rates (including

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60. The correlation between national levels of development and labor participation rates is, however, far from perfect.

61. As in Section III,

$$V_w = \frac{\sqrt{\sum_i (y_i - \bar{y})^2 \frac{f_i}{n}}}{y}$$

but where f_i = labor force of i^{th} region,
n = national labor force,
y_i = income per worker in the i^{th} region,
$\bar{y}$ = national income per worker.

The indices in columns 3 and 4 use the same regional income or product data.

62. Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations. II. Industrial Distribution of National Product and Labor Force," *Economic Development and Cultural Change*, V, No. 4 (July 1957), Appendix Table 8, pp. 106-07.

unpaid family labor and expressed in percentages) is something like the following: France—51.5; United Kingdom—46.2; Germany—46.3; and the United States—39.8; compared with Mexico—32.4; Chile—36.9; Brazil—33.0; and Egypt—37.6. Contrast this with the range of regional labor participation rates in, for example, Italy and Sweden: in Italy (1951) the range lies between 48.0 (Piedmont) and 50.0 (Venice), on the one hand, and 33.0 (Sicily) and 34.0 (Sardinia), on the other; in Sweden (1944) the range lies between 55.1 (the Stockholm region) and 48.6 (Mälmohus), on the one hand, and 39.9 (Norrbottens) and 42.2 (Västerbottens), on the other. The suggestion here, of course, is that in the light of the much smaller range in regional development levels, the range in regional participation rates appears to be significantly larger. Does this suggest that the higher rate of internal, relative to external, migration plays a consistent role in tending to generate regional labor participation rate differentials due to its selective nature? [63]

Note, too, the effect that changes in regional participation rates can have upon historical experience of national economies with spatial income per capita differentials. Although Italian interregional disparities in income per capita increased slightly between two isolated postwar years, 1951 and 1960, productivity disparities declined! If participation rates had remained unchanged during the 1950's, Italian attempts to reduce the North-South schism would have shown more notable success. Notice also that the perverse change in regional participation rates in Canada has dampened what might otherwise have been a very sharp decline in Canadian regional income disparities during the two decades 1931-51. The opposite appears to have been the case for Sweden from 1944 to 1960.

In summary, not all of the North-South problem in these countries is due to productivity differentials: systematic regional differentials in age structure patterns and the like tend to further widen the regional gap already produced by productivity differentials. As we have already noted, Japan is one exception to the rule (as she is to almost any economic generality). With regard to the United States observation for 1900, Easterlin's data should help in explaining the second apparent contradiction to the above generalization. It seems likely that the 1900 observation lies within a pivotal era in United States history. Before the turn of the century, labor force participation rates tend to be higher in the south. After 1900 and up to 1960 this pattern reverses itself and becomes consistent with the results outlined in Table 7; the poorer Southern states are then typified by low participation rates relative to the North and West.

Columns 5 and 6 represent the results of decomposing regional income into a number of economic sectors and an examination of two of these sectors, agriculture and manufacturing. In these columns our V_w measures the degree of regional inequality where agricultural (or industrial) productivity differentials are weighted by the regional share of the agricultural (or industrial) labor force in the national agricultural (or industrial) labor force. Is regional dualism more prevalent in a traditional sector, agriculture, and one in which technology is more localized by regional resource endowment?

The answer to this question is most definitely in the affirmative, although we base it on a very limited sample, because of the rare appearance of regional income data with sector breakdown. The computed ratio of agricultural V_w to industrial V_w is given in column 8. In six out of the eight cases, regional dualism is much more severe in agriculture. The most extreme examples are Yugoslavia, Spain, Brazil, and the United States (1900), where regional income

63. See Section II for a brief theoretical discussion of the selective nature of migration.

TABLE 7.

Labor Participation and Sectoral Distribution: By Regions

Country (1)	Year (2)	Income/ capita (V_W) (3)	Income or prod./ worker (V_W) (4)	Agric. prod./ agric. lab. (V_W) (5)	Indus. Prod./ indus. lab. (V_W) (6)	(3) ÷ (4) (7)	(5) ÷ (6) (V_W) (8)	(5) ÷ (6) (V_{uw}) (9)
Australia	1954/55	0.055	0.024			2.292		
Spain	1957	0.387	0.304	0.373	0.148	1.273	2.520	3.949
Brazil	1950	0.732	0.571	0.578	0.297	1.282	1.946	2.424
Italy	1951	0.363	0.321			1.131		
	1960	0.372	0.303	0.357	0.227	1.228	1.573	1.334
Japan	1959	0.259	0.372	0.177	0.283	0.696	0.625	0.573
Finland	1958	0.313	0.228	0.147	0.141	1.373	1.043	0.994
Sweden	1944	0.311	0.213			1.460		
	1960	0.192	0.133			1.444		
Yugoslavia	1959	0.332	0.103	0.470	0.160	3.233*	2.938	2.573
United States	1900	0.322	0.384	0.461	0.160	0.839	2.881	1.941
France	1951	0.327	0.285	0.331	0.254	1.147	1.303	1.398
Canada	1931	0.272	0.272			1.000		
	1951	0.206	0.179			1.151		
Colombia	1951	0.604	0.568			1.063		
Austria	1957	0.225	0.194			1.160		

Sources (refers only to data not used in previous tables):

(1) Spain. The data used to derive columns 4, 5, and 6 are taken from Banco de Bilbao, *Renta Nacional de España y su Distribucion Provincial, 1957* (Bilbao, 1958), pp. 20-21 and 46-47. The regional units are the same as in Table 1.

(2) Brazil. *Revista Brasileira de Economia,* Ano 14, No. 1 (March 1960), p. 119; and *Annuario Estatistico de Brasil, 1960.* See Table 1 for regional units.

(3) Italy (1951). Tagliacarne's estimates in *Moneta e Credito* (December 1961), pp. 81-84; and Svimez, *Cento Anni di Statistiche sulle Regioni D'Italia* (Roma, 1961), p. 22. (1960) Tagliacarne's 1960 estimates, pp. 48-50 and 44-46. See Table 1 for regional units.

(4) Japan. see Table 1.

(5) Finland. Finland's officiella statistik, *Inkomst-och Förmögenhets-statistik, 1958* (Helsinki, 1961), Table 2, pp. 52–53; based on sixteen "economic regions."

(6) Sweden. (1944) Uses 1940 participation rates derived from Statistiska Centralbyrån, *Statistisk Arsbok för Sverige, 1945* (Stockholm, 1945), T-27, pp. 36–37. (1960) Statistiska Centralbyrån, *Skattetaxeringarna Samt Fördelningen av Inkomst och Förmögenket, 1961* (Stockholm, 1962), T-18, p. 48. See Table 1 for regionsl units.

(7) Yugoslavia. The figure in Column 4 is very suspicious. The data was taken from *Statistichi godisnjak FNRJ, 1961* (Beograd, 1961), pp. 316 and 350; based on eight provinces. The reader should note that it is possible for both columns 5 and 6 to exceed column 4, since we have not examined the service industry.

(8) United States. Derived from Easterlin, in *Trends, op. cit.*

(9) France. Derived from *Etudes et Conjuncture,* Supplement (1955), pp. 18–19 and 85–87; see Table 1 for regional units.

(10) Canada. (1931, 1951) Dominion Bureau of Statistics, *National Accounts: Income and Expenditure, 1926-1956* (Ottawa, 1958), T-28, pp. 64–65, and Appendix T-1, pp. 100–101; R. D. Howland, *Some Regional Aspects of Canada's Economic Development* (Ottawa, 1957), p. 78. See Table 1 for regional units.

(11) Colombia. Uses 1951 population weights and labor force estimates, but 1953 income estimates. *Estudio Sobre las Condiciones del Desarrollo de Colombia,* Mision Economia y Humanismo (Bogatá, 1958), pp. 19 and 326.

(12) Austria. Uses 1951 population and labor force estimates. Österreichischen Statistischen Zentralamt, *Statistiches Handbuch für Die Republik Österreich, 1958* (Wien, 1958), p. 10. See Table 1 for regional units.

inequality in the agricultural sector is approximately two to two-and-a-half times that of industry.[64] In postwar Finland, regional inequality in agriculture is only slightly greater than that of industry, while, again, Japan is the exception—regional dualsim in industrial production is more severe.

Our conclusions are not significantly altered if we compare unweighted indices of sectoral inequality. The ratio of regional productivity variation in agriculture to that of industry, without weighting, is given in column 9. Here again, regional dualism is more striking in the traditional sector, where regional natural resource endowment plays a significant role. At the risk of oversimplification, it appears that the persistence of high degrees of regional income disparities in such countries as Spain, Brazil, Italy, Yugoslavia, and the United States (at the turn of the century) can be further decomposed into two parts: (1) tremendous differentials in agricultural productivity, and (2) significant regional differences in economic structure (the relative importance of manufacturing employment). It would appear that regional "dualism" in the industrial sector plays a minor role, and that its significance has been grossly exaggerated in much of the current development literature.

IX. Summary

This concludes our investigation into the nature of regional dualism. What we have done thus far is to simply describe the nature of the so-called "North-South problem," giving particular attention to the relationship between regional dualism and national economic development. There is a consistent relationship between the two: rising regional income disparities and increasing North-South dualism is typical of early development stages, while regional convergence and a disappearance of severe North-South problems is typical of the more mature stages of national growth and development.

More specifically, both our cross-section approaches and our time series analysis suggest that there is a systematic relation between national development levels and regional inequality or geographic dispersion. In the international cross-section, the degree of regional inequality is very high in Kuznets' middle income class, but consistently lower as we move to higher levels of development. Although our evidence is much less extensive, it also appears from this sample that those nations below the middle income class have not yet generated the high levels of regional inequality associated with Spain, Italy, Colombia, and Brazil. The U.S. cross-section lends support to the international cross-section, in that the states with lowest income per capita are also typically those with the greatest inter-county inequality. The historical evidence on regional productivity or income per capita differentials is much more difficult to collect, but what little information we have on 19th and 20th century Italian, Brazilian, U.S., Canadian, German, Swedish, and French experience suggests that increasing regional inequality is generated during the early development stages, while mature growth has produced regional convergence or a reduction in differentials. Finally, we have seen that regional dualism or inequality is much more extensive within the agricultural than within the industrial sector, and that labor participation rates in part contribute to regional income per capita differentials.

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64. Based on somewhat different information, this generalization seems to hold historically for France. Goreux, *op. cit.*, derived regional dispersion indices for both agricultural and industrial wages. The ratio of V_w in agriculture to that of industry ranges between 1.5 and 2.0 over the period 1862-1926.

This leaves us with a number of interesting related questions which are left unanswered in this study. The most pressing question is, of course, why does this pattern of regional inequality persist? What is the mechanism by which regional income differentials increase in early development stages, then stabilize, and then diminish in mature periods of growth? Have economic institutions in the past been of such a nature to cause capital to first flow in an interregional fashion, so as to increase the income gap between North and South, and then to cause this flow to reverse? Are presently developing nations sufficiently aware of the conflicts between national growth optimization and regional equality? If they are, are they aware of the costs necessary to reduce such inequities in early development stages? What historical role have central governments played in contributing to these patterns of regional inequality, and can contemporary developing nations derive benefit from that knowledge? What role do changing patterns in regional income distribution play in contributing to changes in national size distribution? [65]

But the most important question, one which is related to those enumerated above, has not yet been posed. If, indeed, contemporary underdeveloped nations are attempting to achieve industrialization on a weaker and more unstable socio-political scaffolding, "can... the underdeveloped societies withstand the strain which further widening of income inequality is likely to generate?" [66]

These questions seem extremely important. Hopefully, economists will continue to find them interesting enough so that some answers will appear in future research.

APPENDIX

The tables which follow contain regional data, by nation and over time, which were used in constructing indices appearing in the text. The exception is the set of tables immediately following this explanatory note: there we have time series information on V_w and V_{uw} which was excluded from Table 4. The regional income and product per capita estimates in all other appendix tables are given in terms of relatives rather than absolutes, since the latter are not meaningful without proper price deflators. Such deflators were not systematically collected for this study, since they were unnecessary in computing indices of inequality. Furthermore, the accuracy of regional income estimation is clearly much less questionable when deviations from the national average are used, rather than absolute levels of regional development.

The underlying data for the estimates in Table 1 are all included in this appendix, except for the United States. Regional income data for the United States is familiar to most economists and in any case is readily available in census publications for the modern period and in the monographs mentioned in the text for historical periods. Given restrictions on the pagination of this appendix, that data is not reproduced here. For precisely the same reasons, none of the U.S. cross-sectional data used in text Tables 3a and 3b is included here.

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65. See Eugene Smolensky, "Industrialization and Income Inequality: Recent United States Experience," Regional Science Association *Papers*, VII (1961), 67-88. Some historians have even suggested the use of regional income inequality indices to approximate the historical patterns of national size distribution!

Kuznets, of course, has emphasized the importance of intersectoral distribution as a contributor to size distribution trends. Given the information here contained on regional inequality, is it possible that ***changes*** in national size distribution are dominated by a combination of changing regional differences within sectors and changes between sectors?

66. Kuznets, "Economic Growth and Income Inequality," *op. cit.*, p. 26.

Some general comments on the appendix tables underlying text Tables 5a, 5b, and 7 might be helpful. Unless otherwise noted, A_L refers to the labor force in the sum of agriculture, mining, and quarrying. Furthermore, if no qualification is indicated, the income or product used to compute column 3 in Table 7 is the same as that used for column 4. Industrial income and labor force data utilized in column 6 is defined as manufacturing and mining unless otherwise noted. In these appendix tables underlying Table 7, labor force figures are not given separately due to space limitations. If we have not already made our suspicions and prejudices clear, we might indicate in conclusion that the sectoral data underlying Table 7 is probably the least accurate of all the data presented in this appendix.

Definitions of symbols used in appendix tables:

Y = per capita income of region relative to national average,

P = population of region,

$\frac{A}{L}$ = share of total labor force in agricultural sector.

APPENDIX TABLE 1.

Time Series (not included in Table 4)

Canada	V_w	V_{uw}	Australia	V_w	V_{uw}
1926	0.176	0.245	1949/50	0.057	0.084
1927	0.187	0.259	1950/51	0.063	0.093
1928	0.172	0.247	1951/52	0.069	0.089
1929	0.210	0.261	1952/53	0.048	0.073
1930	0.221	0.274	1953/54	0.051	0.074
1931	0.272	0.323	1954/55	0.055	0.072
1932	0.243	0.304	1955/56	0.058	0.066
1933	0.271	0.324	1956/57	0.055	0.073
1934	0.250	0.303	1957/58	0.061	0.074
1935	0.237	0.283	1958/59	0.058	0.078
1936	0.239	0.281	1959/60	0.068	0.086
1937	0.253	0.301			
1938	0.230	0.285			
1939	0.206	0.260	India		
1940	0.220	0.268	1950/51	0.224	0.571
1941	0.250	0.300	1955/56	0.325	0.589
1942	0.193	0.257	1960/61	0.376	0.685
1943	0.213	0.259			
1944	0.187	0.233			
1945	0.189	0.210	Yugoslavia		
1946	0.158	0.196	1956	0.324	0.439
1947	0.153	0.183	1959	0.332	0.427
1948	0.168	0.231	1960	0.335	0.468
1949	0.194	0.264			
1950	0.199	0.268			
1951	0.206	0.285	Finland		
1952	0.204	0.279	1950	0.385	0.315
1953	0.196	0.276	1954	0.294	0.259
1954	0.197	0.263	1958	0.313	0.253
1955	0.192	0.258			
1956	0.182	0.250			
1957	0.194	0.257	Japan		
1958	0.186	0.253	1951	0.2325	0.2057
1959	0.187	0.246	1952	0.2364	0.2020
1960	0.175	0.232	1953	0.2491	0.2122
1961	0.183	0.242	1954	0.2286	0.1874
			1955	0.2220	0.1782
			1956	0.2482	0.1951
Spain			1957	0.2563	0.2049
1955	0.443	0.369	1958	0.2658	0.2090
1957	0.387	0.343	1959	0.2587	0.2051

Source: See footnotes to Table 1 and Appendix Tables following.

APPENDIX TABLE 2.

Australia: 1949/50 - 59/60 for Fiscal Years

	1949/50		1950/51		1951/52	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
New South Wales[a]	101.4	3,167	103.1	3,263	101.3	3,340
Victoria	106.1	2,175	104.0	2,245	106.0	2,313
Queensland	91.4	1,175	88.4	1,209	85.9	1,240
South Australia[b]	100.0	708	99.4	737	103.4	758
Western Australia	97.1	545	100.6	570	101.0	590
Tasmania	82.7	274	81.1	283	84.9	294
Total	100.0	8,044	100.0	8,307	100.0	8,535

	1952/53		1953/54		1954/55	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
New South Wales[a]	101.2	3,394	101.9	3,436	102.1	3,487
Victoria	103.7	2,375	103.8	2,423	105.3	2,489
Queensland	91.6	1,272	90.6	1,302	91.0	1,325
South Australia[b]	103.2	781	101.0	801	100.5	825
Western Australia	98.3	612	98.6	630	92.6	649
Tasmania	85.2	303	85.3	309	88.2	313
Total	100.0	8,737	100.0	8,901	100.0	9,088

	1955/56		1956/57		1957/58	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
New South Wales[a]	102.4	3,557	103.6	3,626	103.7	3,699
Victoria	105.5	2,563	103.6	2,639	104.8	2,705
Queensland	89.2	1,353	91.8	1,381	89.4	1,405
South Australia[b]	99.8	852	99.8	879	97.4	905
Western Australia	92.7	669	89.6	684	90.7	698
Tasmania	92.5	319	89.2	326	90.9	334
Total	100.0	9,313	100.0	9,535	100.0	9,746

	1958/59		1959/60	
	Y	P (thou.)	Y	P (thou.)
New South Wales[a]	103.7	3,768	105.0	3,842
Victoria	104.3	2,774	104.7	2,853
Queensland	91.7	1,426	89.9	1,447
South Australia[b]	98.3	928	94.0	956
Western Australia	89.6	713	89.1	724
Tasmania	87.8	342	88.0	348
Total	100.0	9,951	100.0	10,170

Y: based on personal income per capita

a. Including Australian Capital Territory

b. Including Northern Territory

Source: Commonwealth Bureau of Census and Statistics; Mr. G. M. Neutze was especially helpful in securing this data for us.

APPENDIX TABLE 3.

Austria: 1957

	1957	
	Y	P (thou.)
Wien	138.3	1,636.2
Niederoesterreich	83.7	1,400.1
Oberoesterreich	91.3	1,105.8
Steiermark	88.3	1,119.2
Tirol	95.5	438.0
Kärnten	84.0	488.1
Salzburg	101.1	328.3
Voralberg	111.5	202.3
Burgenland	64.1	280.3
Total	100.0	6,998.3

Y: based on national income per capita.

Source: "Die Verteilung des Volkseinkommens nach Bundesländern," *Monatsberichte des Oesterreichischen Institutes für Wirtschaftsforschung*, Supplement No. 60 (Vienna, December 1959).

APPENDIX TABLE 4.

Brazil: 1939-59

	1939		1950		1951		1952	
	Y	P share %	Y	P share %	Y	P share %	Y	P share %
Amazonas	71.0	1.0	76.5	1.0	75.0	1.0	73.3	1.0
Para	77.7	2.2	58.6	2.2	58.2	2.2	57.5	2.2
Maranhão	53.2	3.0	34.1	3.1	33.2	3.1	33.2	3.1
Piaui	50.7	2.0	28.7	2.0	27.8	2.0	28.6	2.0
Ceara	51.2	5.1	47.0	5.2	38.6	5.2	40.8	5.2
Rio Grande do Norte	66.1	1.9	53.3	1.9	53.7	1.9	51.2	1.9
Paraiba	58.6	3.5	48.6	3.3	45.1	3.3	43.7	3.3
Pernambuco	78.1	6.6	61.2	6.6	60.6	6.6	55.6	6.6
Alagoas	61.1	2.3	43.8	2.1	43.9	2.1	42.9	2.1
Sergipe	62.0	1.3	48.9	1.2	52.3	1.2	52.3	1.2
Bahia	57.8	9.5	49.7	9.3	46.1	9.3	44.9	9.3
Minas Gerais	77.3	16.3	74.4	14.9	74.3	14.8	73.9	14.6
Espirito Santo	75.9	1.8	78.7	1.7	95.3	1.6	78.7	1.6
Rio de Janeiro	103.1	4.5	101.9	4.4	99.5	4.4	103.8	4.4
Est. du Guanabara	262.1	4.3	334.2	4.6	329.6	4.6	356.9	4.7
São Paulo	155.5	17.5	188.6	17.7	194.4	17.7	196.7	17.7
Parana	97.2	3.1	117.1	4.1	111.5	4.2	124.2	4.4
Santa Catarina	88.7	2.9	84.0	3.0	75.7	3.0	80.5	3.0
Rio Grande do Sul	140.0	8.1	112.0	8.0	106.7	8.0	109.3	8.0
Mato Grosso	109.7	1.0	72.4	1.0	72.6	1.0	99.5	1.0
Goias	63.4	2.0	54.5	2.3	60.6	2.3	51.0	2.4
Brazil	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix Table 4 (cont.)

	1953		1954		1955		1956	
	Y	P share %	Y	P share %	Y	P share %	Y	P share %
Amazonas	66.9	1.0	64.5	1.0	63.8	1.0	76.2	1.0
Para	54.7	2.1	51.6	2.1	54.3	2.1	60.9	2.1
Maranhão	33.5	3.1	32.3	3.1	31.2	3.1	31.1	3.1
Piaui	24.9	2.0	23.8	2.0	23.3	2.0	25.0	2.0
Ceara	33.0	5.2	33.8	5.2	33.9	5.3	37.2	5.3
Rio Grande do Norte	41.3	1.9	40.9	1.9	41.8	1.9	46.1	1.9
Paraiba	37.3	3.3	39.7	3.2	39.8	3.2	41.2	3.2
Pernambuco	54.7	6.6	53.8	6.6	51.1	6.5	53.3	6.5
Alagoas	40.9	2.0	38.5	2.0	37.9	2.0	42.7	2.0
Sergipe	50.3	1.2	46.7	1.2	44.7	1.2	49.7	1.2
Bahia	45.6	9.3	49.7	9.2	47.0	9.2	45.7	9.2
Minas Gerais	79.6	14.5	81.1	14.3	79.9	14.2	81.5	14.1
Espirito Santo	83.1	1.6	82.5	1.6	81.6	1.6	80.4	1.6
Rio de Janeiro	101.3	4.4	97.8	4.4	98.3	4.4	106.8	4.4
Est. du Guanabara	308.1	4.7	307.2	4.7	300.9	4.7	316.4	4.8
São Paulo	192.5	17.7	197.3	17.7	190.5	17.7	181.3	17.7
Parana	121.0	4.5	100.6	4.7	120.5	4.8	93.8	5.0
Santa Catarina	89.7	3.1	80.5	3.1	89.3	3.1	89.1	3.1
Rio Grande do Sul	119.6	8.0	121.7	8.0	125.3	8.0	130.4	8.0
Mato Grosso	114.1	1.0	121.9	1.0	111.0	1.0	110.0	1.0
Goias	64.8	2.5	59.6	2.5	63.2	2.5	59.0	2.6
Brazil	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

	1957		1958		1959	
	Y	P share %	Y	P share %	Y	P share %
Amazonas	79.9	1.0	74.3	1.0	66.1	1.0
Para	63.3	2.1	58.1	2.1	52.9	2.1
Maranhão	33.1	3.1	34.7	3.1	34.4	3.1
Piaui	25.7	2.0	24.2	2.0	28.5	2.0
Ceara	38.3	5.3	27.9	5.3	41.1	5.3
Rio Grande do Norte	44.5	1.9	37.0	1.9	52.2	1.9
Paraiba	40.2	3.2	36.4	3.2	45.9	3.2
Pernambuco	57.0	6.5	57.2	6.5	61.2	6.6
Alagoas	46.8	2.0	49.1	1.9	49.4	2.0
Sergipe	51.4	1.2	53.0	1.2	56.4	1.2
Bahia	46.6	9.2	48.0	9.1	51.0	9.2
Minas Gerais	83.0	13.9	77.6	13.8	75.3	13.8
Espirito Santo	83.3	1.6	73.8	1.5	64.8	1.5
Rio de Janeiro	105.7	4.4	107.3	4.4	95.1	4.4
Est. du Guanabara	302.3	4.8	316.0	4.8	310.5	4.9
São Paulo	181.6	17.7	185.6	17.7	175.8	17.8
Parana	101.2	5.1	109.4	5.3	110.3	5.3
Santa Catarina	86.0	3.1	86.7	3.1	85.6	3.1
Rio Grande do Sul	124.1	8.0	117.3	8.0	116.1	8.0
Mato Grosso	101.6	1.0	117.0	1.0	70.8	1.0
Goias	54.7	2.6	56.1	2.6	57.2	2.7
Brazil	100.0	100.0	100.0	100.0	100.0	100.0

Y: based on national income per capita.

Source: *Revista Brasileira de Economia*, Ano 14, No. 1 (March 1960), and Ano 15, No. 1 (March 1961).

APPENDIX TABLE 5.

Canada: 1950-61

	1950		1951		1952		1953	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Newfoundland	51.5	351	50.3	361	48.7	374	51.2	383
Prince Edward Island	56.4	96	54.2	98	59.0	100	52.9	101
Nova Scotia	74.2	638	68.7	643	70.4	653	72.1	663
New Brunswick	69.5	512	65.7	516	64.2	526	62.9	533
Quebec	85.4	3,969	82.1	4,056	82.7	4,174	84.8	4,269
Ontario	120.7	4,471	117.3	4,598	117.2	4,788	118.1	4,941
Manitoba	100.4	768	100.4	776	97.3	798	94.4	809
Saskatchewan	86.7	833	117.6	832	119.2	843	106.8	861
Alberta	102.9	913	115.8	939	113.5	973	109.9	1,012
British Columbia	123.0	1,137	119.1	1,165	119.2	1,205	119.7	1,248
Yukon and Northwest Territory	-	-	74.3	25	76.5	25	77.7	25
Canada	100.0	13,688	100.0	14,009	100.0	14,459	100.0	14,845

	1954		1955		1956		1957	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Newfoundland	54.2	395	53.4	406	53.8	415	55.6	424
Prince Edward Island	56.7	101	54.6	100	56.3	99	55.0	99
Nova Scotia	74.9	673	73.2	683	73.2	695	73.7	701
New Brunswick	66.9	540	66.1	547	67.2	555	65.4	562
Quebec	87.9	4,388	86.3	4,517	85.9	4,628	86.2	4,769
Ontario	120.0	5,115	119.6	5,266	117.9	5,405	119.5	5,636
Manitoba	93.4	823	93.8	839	95.6	850	94.1	862
Saskatchewan	76.9	873	90.4	878	100.8	881	83.0	880
Alberta	102.8	1,057	101.7	1,091	103.9	1,123	102.1	1,164
British Columbia	122.5	1,295	121.5	1,342	118.5	1,399	122.1	1,482
Yukon and Northwest Territory	83.0	27	92.8	29	111.1	31	97.1	31
Canada	100.0	15,287	100.0	15,698	100.0	16,081	100.0	16,610

	1958		1959		1960		1961	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Newfoundland	54.9	432	55.4	441	57.7	448	58.8	458
Prince Edward Island	58.8	100	61.3	101	64.5	103	61.9	105
Nova Scotia	73.9	709	75.0	719	75.9	727	77.4	737
New Brunswick	65.5	571	66.0	582	68.8	589	68.5	598
Quebec	85.7	4,904	84.9	5,024	85.0	5,142	86.6	5,259
Ontario	118.6	5,821	118.8	5,969	117.3	6,111	118.9	6,236
Manitoba	99.8	875	100.0	891	99.8	906	96.0	922
Saskatchewan	86.0	891	86.9	907	95.4	915	77.0	925
Alberta	106.2	1,206	103.9	1,248	102.0	1,291	102.9	1,332
British Columbia	117.4	1,538	118.0	1,567	117.5	1,602	117.6	1,629
Yukon and Northwest Territories	81.8	33	83.1	34	78.5	36	80.8	37
Canada	100.0	17,080	100.0	17,483	100.0	17,870	100.0	18,238

Y: based on personal income per capita.

Source: Dominion Bureau of Statistics, *National Accounts, Income and Expenditure, 1926-56* (Ottawa, 1958), T-29 and Appendix T-1, pp. 64-65 and 100-01; *National Accounts, Income and Expenditure, 1961* (Ottawa, 1962), T-29 and Appendix T-1, pp. 38 and 60.

APPENDIX TABLE 6.

Chile: 1958

	1958	
	Y	P (thou.)
Tarapaca y Antofagasta	124.4	358.0
Atacama y Coquimbo	85.4	426.0
Aconcagua y Valparaiso	146.7	780.0
Santiago y O'Higgins	125.0	2,463.8
Colchagua y Curico y Talca y Mank y Linares	59.1	773.0
Ñuble y Concepcion y Arauco y Bio-Bio	77.5	1,087.2
Malleco y Cautin	57.1	652.8
Valdivia y Osorno y Llanquihue y Chiloé y Aysen	70.4	775.0
Magallanes	194.6	68.7
Chile	100.0	7,384.5

Y: income concept not given in source.

Source: *Estudio de Recursos Humanos de Nivel Universitario en Chile,* Parte 1a, Instituto de Organizacion y Administracion, Facultad de Ciencias Economicas, Universidad de Chile (Santiago, 1962), T-5a and T-7, pp. 228 and 53. (The primary source indicated is el Departamento de Planificacion de la Corporacion do Fomento de la Produccion.)

APPENDIX TABLE 7.

Colombia: 1953

	1953	
	Y	P (thou.)
Antioquia	139.8	1,642.7
Atlantico	167.1	462.7
Bolivar	58.3	693.7
Boyaca	36.7	811.4
Caldas	89.0	1,126.8
Cauca	33.7	459.4
Cordoba	24.5	340.2
Caudinamarca	189.7	1,712.1
Choco	17.6	134.6
Huila	46.3	308.6
Magdalena	42.2	479.4
Nariño	29.6	561.4
Norte de Santander	75.4	394.2
Santander	66.3	771.2
Tolima	92.8	743.5
Valle	117.0	1,220.5
Colombia	100.0	11,862.3

Y: income concept not clear in source but appears to be based on estimates of national income per capita.

Source: *Estudio Sobre las Condiciones del Desarrollo de Colombia,* Mision "Economia y Humanismo" (Bogota, 1958), p. 326.

APPENDIX TABLE 8.

Finland: 1950, 1954, 1958

	1950			1954			1958	
	Y	P (thou.)		Y	P (thou.)		Y	P (thou.)
Södra Finlands Kustland	133.3	834	Undenmaan	158.8	717	Uusimaa	132.3	777
Tammerfors' Regionen	122.9	174	Turun-Porin	98.3	643	Varsinais-Suomi	103.9	371
Sydvästra Finlands Kustland	111.4	336	Ahvenanmaa	79.1	22	Ahvenanmaa	111.2	22
Villmanstrand-Imatra Regionen	111.8	78	Hämeen	106.9	576	Satakunta	95.0	229
Uleåborgs Regionen	106.8	93	Kymen	104.2	323	Etelä-Häme	95.1	304
Kumo Älvdal	103.6	114	Mikkelin	74.2	247	Tammermaa	98.7	383
Vasa Regionen	90.8	276	Kuopion	73.7	488	Kaakkois-Suomi	99.9	331
Jyväskylä-Mäntta Regionen	100.2	141	Vaasan	77.3	626	Keski-Suomi	84.8	240
Kemi och Torneå Älvdalar	99.6	103	Oulun	74.7	382	Etelä-Savo	82.8	241
Loimaa-Karkkila Storregionen	84.9	140	Lapin	84.2	179	Pohjois-Savo	77.5	233
Kajana Regionen	85.9	38	Finland	100.0	4,204	Pohjois-Karjala	74.3	211
Kuopio Regionen	86.8	129				Etelä-Pohjanmaa	84.8	367
Södra Tavastlands Storregionen	83.6	148				Keski-Pohjanmaa	74.3	203
Tavastkyro Regionen	78.8	78				Pohjois-Pohjanmaa	96.0	162
Södra Savolaks Storregionen	81.3	315				Kainuu	83.3	104
Luumäki Regionen	69.5	42				Lappi	95.9	197
Sydvästra Finlands Skärgård	86.5	32				Finland	100.0	4,375
Kalajokki Regionen	72.5	65						
Eurajokki-Urjala Regionen	75.2	75						
Suomenselka Storregionen	64.6	472						
Norra Karelens Storregionen	62.5	168						
Norra Lapplands Regionen	71.8	48						
Kainuu-Kuusamo Regionen	63.2	109						
Finland	100.0	4,007						

Y: estimates are of declared income per capita from income tax revenue sources.

Source: 1950—Lars Wahlbeck, *Om Inkomstnivåns Geografi i Finland är 1950,* Vol. 1 and 2, Ekonomi och Samhalle, Skrifter utgivna av Svenska Handelskogskolan, No. 2 (Helsingfors: Soderstrom and Co., 1955), T-10, pp. 574-75, and T-11, pp. 576-77. 1954, 1958—Finlands Officiella Statistik, *Inkomst-och Förmögenhet statistik (1954 and 1958)* (Helsinki, 1957 and 1961), T-1 and T-1b, pp. 28-31 and 48-51, respectively.

APPENDIX TABLE 9.

France: 1864-1958

	1864		1954	
	Y	P (thou.)	Y	P (thou.)
Nord	106.1	4,007.6	100.9	5,039.9
Est	87.6	2,720.5	98.5	3,182.7
Region parisienne	175.1	3,039.0	150.6	7,305.9
Pourtours parisienne	126.3	1,673.2	89.3	1,544.7
Normandie	109.0	2,650.7	94.8	2,442.3
Bretagne	62.1	2,397.4	77.9	2,347.1
Val de Loire	101.1	2,563.3	80.6	2,577.8
Bocage	105.5	1,919.9	74.3	1,811.3
Centre Nord	81.8	2,505.2	84.9	2,129.2
Centre Sud	72.3	1,398.8	71.7	1,016.8
Saône	92.8	2,156.1	90.5	1,917.0
Haut-Rhône	86.3	2,714.2	103.2	3,101.6
Aquitaine	93.0	2,274.7	80.9	2,192.1
Garonne	88.4	2,153.6	82.6	1,675.1
Bas-Languedoc	93.6	1,722.3	86.5	1,626.0
Provence	90.6	2,170.6	90.1	2,927.4
France	100.0	38,067.1	100.0	42,837.0

	1955/56		1958	
	Y	P (thou.)	Y	P (thou.)
Alsace	102.8	1,237	99.8	1,264
Aquitaine	76.7	2,232	75.9	2,267
Auvergne	82.6	1,252	82.8	1,255
Bourgogne	81.8	1,387	81.8	1,406
Bretagne	69.7	2,349	68.7	2,351
Centre	80.0	1,775	81.9	1,790
Champagne	92.9	1,155	93.8	1,179
Franche-Comté	91.5	872	91.4	893
Languedoc	76.8	1,460	79.6	1,478
Limousin	72.9	737	72.6	725
Lorraine	104.5	2,012	101.0	2,106
Midi-Pyrénées	72.5	1,989	74.4	2,013
Nord	103.4	3,447	102.6	3,523
Normandie (Basse)	77.7	1,188	77.3	1,212
Normandie (Haute)	104.0	1,305	102.8	1,353
Pays de la Loire	74.4	2,354	75.4	2,396
Picardie	90.5	1,414	89.6	1,453
Poitou-Charentes	71.7	1,413	69.9	1,436
Provence	89.3	2,627	90.1	2,721
Region parisienne	161.7	7,556	159.6	7,985
Rhône-Alpes	100.8	3,681	101.5	3,778
France	100.0	43,442	100.0	44,584

Y: 1864 and 1954—disposable income per capita; 1955/56 and 1958—personal income per capita.

Source: 1864 and 1954—N. Delefortrie and J. Morice, *Les Revenus Departmentaux en 1864 et en 1954*, Recherches sur L'Economie Francaise, No. 1 (Paris, 1959), pp. 196-98, 208-10, 246-48, and 261-63. 1955/56 and 1958—"Evolution Regionale des Revenus des Particulars de 1955/56 a 1958," *Etudes et Conjuncture*, No. 5 (May 1961), pp. 387 and 389.

APPENDIX TABLE 10.

Greece: 1954

	1954	
	Y	P (thou.)
Sterea Hellas and Euboia	143.0	2,439
Macedonia	91.9	1,768
Aegean Islands	84.7	277
Pelopennesos	84.1	1,121
Cyclades	81.3	124
Thessaly	79.7	657
Crete	72.8	472
Dodecanesos	68.0	120
Thrace	62.5	348
Ionian Islands	61.1	221
Epirus	58.3	347
Greece	100.0	7,894

Y: based on national income per capita.

Source: Benjamin Ward, *Greek Regional Development*, Center of Economic Research Monograph Series, No. 4 (Athens, 1962), T-3.13, p. 54.

APPENDIX TABLE 11.

India: 1950/51, 1955/56 Fiscal Years

	1950/51		1955/56	
	Y	P (thou.)	Y	P (thou.)
Andhra	90.5	31,099	92.0	33,530
Assam	107.9	8,800	101.0	10,410
Bihar	64.8	38,700	65.3	41,080
Gujarat	120.0	16,874	114.4	18,560
Kerela	113.0	13,300	107.1	15,000
Madhya Pradesh	91.2	25,899	95.5	27,450
Madras	104.3	29,699	101.6	32,300
Maharashtra	124.3	30,999	132.2	34,018
Mysore	78.1	19,201	78.7	21,330
Orissa	72.3	14,506	70.6	15,260
Punjab	117.1	15,900	119.1	17,590
Rajasthan	85.4	15,799	91.6	17,389
Uttar Pradesh	92.7	62,836	87.7	67,278
West Bengal	151.4	26,100	151.7	27,469
Delhi	316.3	1,700	326.1	2,090
Himachal Pradesh	70.7	1,100	70.6	1,120
Manipur	40.1	600	43.5	610
Tripura	121.1	600	102.0	650
India	100.0	353,712	100.0	383,136

Y: based on national income per capita.

Source: Original data from the Indian Institute of Public Opinion; reprinted in "A Post Election Survey," *The Eastern Economist*, March 30, 1962, p. 866.

APPENDIX TABLE 12.

Ireland: 1960

	1960	
	Y	P (thou.)
Carlow	95.0	33.5
Dublin	143.1	714.2
Kildare	106.6	64.7
Kilkenny	97.8	62.2
Laoighis	90.6	45.5
Longford	64.1	31.1
Louth	102.8	67.7
Meath	96.1	65.5
Offaly	90.1	51.6
Westmeath	85.1	53.1
Wexford	81.8	84.1
Wicklow	87.3	58.8
Clare	71.3	74.4
Cork	101.7	331.5
Kerry	74.6	117.6
Limerick	95.0	134.0
Tipperary	93.9	124.9
Waterford	103.3	71.9
Galway	75.1	151.0
Leitrim	66.3	34.2
Mayo	62.4	125.2
Roscommon	70.7	60.1
Sligo	76.8	54.2
Cavan	70.7	57.6
Donegal	65.7	115.5
Monaghan	74.0	48.1
Ireland	100.0	2,832.0

Y: based on "earned" income per capita (income created within regional boundaries).

Source: E. A. Attwood and R. C. Geary, *Irish County Incomes in 1960*, The Economic Research Institute, Paper No. 16 (Dublin, September 1963).

APPENDIX TABLE 13.

Italy: 1951-60

	1951		1955		1960	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Piemonte	152.4	3,518.2	149.3	3,652.0	146.2	3,856.8
Valle d'Aosta	188.9	94.1	166.5	97.8	148.8	102.6
Lombardia	158.9	6,566.2	152.5	6,807.7	154.6	7,263.3
Trentino-Alto Adige	112.5	728.6	108.6	758.3	100.2	787.9
Veneto	88.3	3,918.1	92.6	3,914.8	96.6	3,911.8
Friuli-Venezia G.	116.5	1,226.1	103.7	1,244.4	99.3	1,247.9
Liguria	153.6	1,567.0	141.5	1,617.6	152.9	1,714.0
Emilia-Romagna	104.5	3,544.4	110.5	3,608.3	117.0	3,680.6
Toscana	98.8	3,158.8	101.0	3,234.1	102.3	3,309.8
Umbria	80.1	803.9	78.1	819.2	74.4	821.7
Marche	74.4	1,364.0	81.2	1,374.8	74.3	1,380.2
Lazio	103.8	3,340.8	121.7	3,567.6	77.2	3,884.1
Abruzzi e Molise	62.5	1,684.0	62.9	1,704.9	57.5	1,684.5
Campania	71.5	4,346.3	68.6	4,576.6	67.4	4,849.4
Puglia	64.0	3,220.5	62.5	3,386.9	61.2	3,470.0
Basilicata	53.4	627.6	53.8	652.9	44.4	666.7
Calabria	53.6	2,044.3	49.9	2,127.7	45.0	2,173.2
Sicilia	62.5	4,486.8	64.5	4,681.5	60.5	4,869.8
Sardegna	80.7	1,276.0	77.2	1,365.4	69.4	1,450.5
Italy	100.0	47,515.7	100.0	49,192.5	100.0	51,124.8

Y: based on estimates of net national product per capita.

Source: G. Tagliacarne, "Calcolo del reddito prodotto nelle provincie e regioni d'Italia nel 1960," *Moneta e Credito* (1960), T-1, pp. 514-18.

APPENDIX TABLE 14.

Japan: 1950-59

	1950		1955		1959	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Hokkaido	113.5	4,296	101.4	4,773	97.8	5,048
Aomori-ken	91.0	1,283	75.6	1,383	75.8	1,437
Iwate-ken	83.5	1,347	72.6	1,427	69.5	1,461
Miyagi-ken	95.7	1,663	86.9	1,727	88.4	1,759
Akita-ken	93.7	1,309	83.8	1,349	73.0	1,346
Yamagata-ken	84.4	1,357	81.5	1,354	81.9	1,340
Fukushima-ken	82.0	2,062	80.0	2,095	77.9	2,091
Niigata-ken	93.2	2,461	89.3	2,473	84.2	2,452
Ibaraki-ken	-	-	-	-	78.3	2,073
Tochigi-ken	-	-	88.4	1,548	82.3	1,528
Gumma-ken	-	-	82.2	1,614	80.2	1,602
Saitama-ken	-	-	89.6	2,263	87.8	2,383
Chiba-ken	96.7	2,139	87.6	2,205	86.5	2,282
Tokyo-to	-	-	149.3	8,037	162.9	9,318
Kanagawa-ken	-	-	118.3	2,919	119.9	3,282
Yamanashi-ken	83.3	811	79.7	807	77.0	785
Nagano-ken	76.6	2,061	89.0	2,021	86.2	1,987
Shizuoka-ken	109.1	2,471	90.2	2,650	94.0	2,736
Toyama-ken	107.8	1,009	99.8	1,021	98.9	1,023
Ishikawa-ken	-	-	94.8	966	92.3	972
Gifu-ken	89.9	1,545	86.4	1,584	89.3	1,614
Aichi-ken	122.4	3,391	110.3	3,769	112.6	4,104
Mie-ken	97.4	1,461	88.7	1,486	79.4	1,483
Fukui-ken	101.7	752	94.3	754	89.6	752
Shiga-ken	97.9	861	92.0	854	90.1	845
Kyoto-fu	-	-	114.3	1,935	115.2	1,992
Osaka-fu	-	-	136.1	4,618	136.3	5,268
Hyogo-ken	144.8	3,310	119.8	3,621	122.9	3,843
Nara-ken	94.4	764	93.7	777	95.2	771
Wakayama-ken	110.7	982	86.0	1,007	89.8	1,007
Tottori-ken	89.2	600	92.3	614	71.8	609
Shimane-ken	84.9	913	82.6	929	80.0	909
Okayama-ken	-	-	92.8	1,690	86.5	1,689
Hiroshima-ken	83.3	2,082	89.9	2,149	94.5	2,197
Yamaguchi-ken	122.1	1,541	94.3	1,610	82.4	1,635
Tokushima-ken	-	-	77.3	878	79.3	861
Kagawa-ken	-	-	99.6	944	92.2	936
Ehime-ken	114.7	1,522	87.3	1,541	81.3	1,534
Kochi-ken	95.4	874	83.8	883	82.9	876
Fukuoka-ken	-	-	102.9	3,860	104.1	4,053
Saga-ken	106.4	945	84.9	974	76.5	964
Nagasaki-ken	96.9	1,645	84.3	1,748	77.3	1,792
Kumamoto-ken	92.4	1,828	82.8	1,896	71.0	1,907
Oita-ken	91.6	1,253	83.3	1,277	84.9	1,265
Miyazaki-ken	76.3	1,091	70.3	1,139	69.8	1,154
Kagoshima-ken	77.3	1,804	62.2	2,044	61.1	2,005
Japan	100.0	53,433	100.0	87,213	100.0	92,971

Y: based on personal income per capita.

Source: The income data is derived from unpublished data of the Economic Research Institute of the Japanese Economic Planning Agency. They were kindly made available to us by Mr. Tsunehiko Watanabe.

APPENDIX TABLE 15.

Netherlands: 1938-58

	1938		1946		1950	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Gronigen	85.3	421.6	97.6	447.4	97.5	461.8
Friesland	67.6	422.3	89.0	456.6	90.0	467.7
Drenthe	50.0	245.3	73.2	269.8	79.2	285.1
Overijssel	73.5	569.9	84.1	633.6	93.3	682.2
Gelderland	76.5	914.2	86.6	1,020.0	87.5	1,101.0
Utrecht	117.6	472.7	103.7	544.7	101.7	584.2
Noord-Holland	141.2	1,666.4	119.5	1,759.5	115.8	1,874.6
Zuid-Holland	123.5	2,138.8	114.6	2,256.5	110.0	2,424.6
Zeeland	82.3	254.6	97.6	258.5	100.8	271.7
Noord-Brabant	64.7	1,019.1	84.1	1,168.5	83.3	1,267.2
Limburg	73.5	603.0	86.6	677.6	88.3	745.1
Netherlands	100.0	8,728.0	100.0	9,492.4	100.0	10,165.2

	1955		1958	
	Y	P (thou.)	Y	P (thou.)
Gronigen	91.8	465.7	92.0	471.7
Friesland	78.9	470.3	82.5	474.7
Drenthe	76.0	297.3	80.2	308.0
Overijssel	88.9	728.0	90.1	760.0
Gelderland	87.1	1,185.3	89.6	1,250.3
Utrecht	102.9	628.9	105.7	662.8
Noord-Holland	117.5	1,974.8	116.5	2,038.2
Zuid-Holland	111.7	2,570.8	111.8	2,668.2
Zeeland	100.0	276.6	92.9	283.4
Noord-Brabant	85.4	1,377.7	85.8	1,456.7
Limburg	88.9	817.6	89.6	869.3
Netherlands	100.0	10,252.9	100.0	11,243.4

Y: based on net product at factor cost per capita.

Source: Professor Idenburg of the Netherlands Central Bureau of Statistics kindly supplied us with the income data which appears quarterly in that Bureau's publication entitled "Statistische en econometrische onderzoekingen." The population data come from the *Statesman's Yearbook*.

APPENDIX TABLE 16.

New Zealand: 1955

	1955	
	Y	P (thou.)
Auckland	96.4	841.3
Hawkes Bay	103.6	100.1
Taranaki	93.4	93.7
Wellington	107.6	430.3
Marlborough	96.0	24.6
Nelson	87.9	71.7
Westland	97.5	18.9
Canterbury	98.0	300.2
Otago	99.9	168.5
Southland	119.4	81.6
New Zealand	100.0	2,130.9

Y: defined as total (national) income per capita.

Source: G. M. Neutze, "Provincial Income Estimate," *The New Zealand Geographer*, XVII, No. 2 (October 1961), 223-28.

APPENDIX TABLE 17.

Norway: 1952-60

	1952		1957		1958	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Østfold	110.8	187.5	106.7	196.6	106.7	198.4
Akershus	116.9	187.0	119.8	211.9	121.8	216.9
Oslo	168.4	437.2	170.2	455.1	168.3	461.6
Hedmark	83.4	173.6	84.8	177.1	85.6	177.2
Oppland	80.2	161.7	83.3	164.9	83.1	165.5
Buskerud	106.1	157.7	104.1	164.1	105.4	165.7
Vestfold	112.0	157.0	106.3	166.8	106.8	168.3
Telemark	101.4	137.7	100.6	145.5	100.5	147.5
Aust-Agder	75.0	76.1	78.3	76.6	78.5	76.7
Vest-Agder	91.7	97.7	93.2	104.7	93.5	105.8
Rogaland	94.6	214.2	92.8	228.4	90.9	231.4
Hordaland	80.4	201.0	80.2	215.1	78.9	218.0
Bergen	122.3	113.0	119.5	114.7	118.4	114.7
Sogn og Fjordane	63.1	98.0	71.3	98.8	71.7	99.1
Møre og Romsdal	79.1	194.4	77.7	207.0	73.8	208.8
Sør-Trøndelag	89.6	198.9	89.5	206.0	89.8	207.3
Nord-Trøndelag	71.1	110.9	70.7	115.6	71.2	115.9
Nordland	65.4	223.4	66.8	234.8	68.8	235.8
Troms	64.8	118.6	61.7	124.3	64.5	125.2
Finnmark	70.7	65.4	68.5	70.0	72.9	70.4
Norway	100.0	3,310.8	100.0	3,477.8	100.0	3,510.2

Appendix Table 17 (continued)

	1959		1960	
	Y	P (thou.)	Y	P (thou.)
Østfold	104.5	200.4	106.3	201.6
Akershus	122.0	221.9	122.8	226.9
Oslo	167.2	465.7	168.0	471.5
Hedmark	86.4	177.7	85.8	177.9
Oppland	83.1	165.9	82.7	166.0
Buskerud	105.7	166.8	104.9	167.8
Westfold	105.9	169.8	106.5	172.0
Telemark	98.6	148.8	97.9	149.5
Aust-Agder	79.4	77.0	79.5	77.1
Vest-Agder	93.0	107.0	93.2	108.2
Rogaland	92.2	234.2	90.9	236.5
Hordaland	79.9	220.6	79.7	223.1
Bergen	116.9	115.4	117.2	115.8
Sogn og Fjordane	70.8	99.8	69.9	100.0
Møre og Romsdal	74.5	210.4	73.7	212.0
Sør-Trøndelag	90.7	208.7	90.3	210.5
Nord-Trøndelag	72.9	116.5	73.9	116.6
Nordland	69.6	237.3	68.8	238.7
Troms	65.4	125.8	63.9	126.8
Finnmark	70.8	71.1	71.6	71.7
Norway	100.0	3,540.5	100.0	3,570.6

Y: based on assessed income per capita from income tax sources.

Source: Mr. Signy Arctander of the Norwegian Central Bureau of Statistics made these figures available to us.

APPENDIX TABLE 18.

Philippines: 1957

	1957	
	Y	No. of families (thou.)
Manila	289.6	296
Ilocos and Mt. Province	112.2	286
Cagayan Valley and Batanes	86.7	190
Central Luzon	97.4	517
Southern Luzon[a]	97.7	477
Bicol Province	73.7	334
Western Visayas	88.6	595
Eastern Visayas	63.0	653
Southwest Mindanao and Sulu	80.1	347
Northeast Mindanao	77.9	263
Philippines	100.0	3,959

a. Plus Marinduque, Mindoro and Palawan.

Y: based on personal income per family.

Source: Income data from *The Philippine Statistical Survey of Households*, Series No. 4 ("Family Income and Expenditure"), Bureau of Census and Statistics (Manila, June 1958), T-1, p. 22; population data from *The Philippine Statistical Survey of Households* ("Demographic and Socio-Economic Data May 1957 and May 1958"), Bureau of Census and Statistics (Manila, June 1960), T-8, p. 13.

APPENDIX TABLE 19.

Puerto Rico: 1960

	1960			1960	
	Y	P (thou.)		Y	P (thou.)
Adjuntas	54.4	19.7	Lares	48.9	26.9
Aguada	49.7	23.2	Las Marías	50.2	9.2
Aguadilla	104.3	47.9	Las Piedras	54.6	17.0
Aguas Buenas	87.1	17.0	Loíza	84.5	28.1
Aibonito	75.9	18.4	Luquillo	98.3	8.6
Añasco	53.6	17.2	Manatí	72.4	29.4
Arecibo	77.6	69.9	Maricao	45.6	7.0
Arroyo	67.9	13.3	Maunabo	46.6	10.8
Barceloneta	55.9	19.3	Mayagüez	105.8	83.9
Barranquitas	58.9	19.0	Moca	41.7	22.0
Bayamón	185.1	72.2	Morovis	47.6	18.1
Cabo Rojo	75.2	24.9	Naguabo	70.2	17.2
Caguas	117.6	65.1	Narajito	87.9	17.3
Camuy	61.4	19.7	Orocovis	41.0	20.4
Carolina	155.4	40.9	Patillas	41.6	17.1
Cataño	129.9	25.2	Peñuelas	71.1	14.9
Cayey	92.7	38.1	Ponce	111.1	145.6
Ceiba	155.0	9.1	Quebradillas	71.6	13.1
Ciales	50.2	18.1	Rincón	51.0	8.7
Cidra	62.2	21.9	Río Grande	90.0	17.2
Coamo	56.8	26.1	Sabana Grande	85.3	15.9
Comerío	71.1	18.6	Salinas	78.1	23.1
Corozal	73.2	23.6	San Germán	74.8	27.7
Dorado	107.6	13.5	San Juan	192.2	451.6
Fajardo	107.0	18.3	San Lorenzo	51.6	27.9
Guánica	89.5	13.8	San Sebastián	63.2	33.5
Guayama	89.9	33.7	Santa Isabel	72.7	14.5
Guayanilla	60.7	17.4	Toa Alta	86.0	15.7
Guaynabo	151.7	39.7	Toa Baja	130.4	19.7
Gurabo	101.8	16.6	Trujillo Alto	115.5	18.3
Hatillo	69.4	20.2	Utuado	48.2	40.4
Hormigueros	95.7	7.2	Vega Alta	89.5	17.6
Humacao	76.5	33.4	Vega Baja	74.5	30.2
Isabela	45.0	28.8	Vieques	72.6	7.2
Jayuya	51.2	14.6	Villalba	54.8	16.2
Juana Díaz	75.6	30.0	Yabucoa	45.3	29.8
Juncos	90.9	21.5	Yauco	73.8	34.8
Lajas	76.3	15.4	Puerto Rico	100.0	2,349.0

Y: based on estimates of median income per family but using population weights.

Source: 1960 United States *Census of Population*, "Puerto Rico," T-35 and T-37, pp. 116 and 117.

APPENDIX TABLE 20.

Spain: 1955-57

	1955		1957	
	Y	P (thou.)	Y	P (thou.)
Álava	141.4	122.8	140.1	127.4
Albacete	57.7	378.2	65.0	382.2
Alicante	84.6	660.2	76.0	682.8
Almería	53.0	352.5	54.1	362.1
Ávila	56.7	249.5	60.6	252.5
Badajoz	56.2	845.2	69.3	856.8
Baleares	107.5	429.8	104.2	437.5
Barcelona	155.3	2,508.1	148.4	2,648.0
Burgos	94.7	392.2	95.5	398.9
Cáceres	54.7	557.4	57.3	562.1
Cádiz	92.9	763.5	77.1	858.7
Castellón	92.1	328.5	101.7	331.8
Ciudad Real	66.2	567.4	54.6	577.2
Córdoba	70.7	788.2	55.6	800.5
Coruña	77.0	980.0	79.3	999.7
Cuenca	63.6	322.5	71.3	324.8
Gerona	106.6	335.1	107.8	341.5
Granada	49.6	762.3	53.1	773.4
Guadalajara	77.7	196.6	82.7	195.7
Guipúzcoa	219.0	415.3	199.8	441.3
Huelva	84.6	385.2	79.8	395.7
Huesca	82.4	239.1	82.5	240.7
Jaén	54.8	747.6	55.9	764.4
León	82.7	562.7	81.4	580.2
Lérida	90.3	329.8	96.8	333.0
Logroño	110.9	228.9	116.7	230.1
Lugo	59.5	494.6	68.8	498.8
Madrid	159.3	2,147.5	164.3	2,243.1
Málaga	71.3	752.6	62.8	853.0
Murcia	69.7	780.0	68.9	797.4
Navarra	119.6	389.7	121.9	396.0
Orense	52.3	459.5	52.2	465.2
Oviedo	117.6	951.1	117.2	979.3
Palencia	110.0	236.4	95.2	238.1
Las Palmas	87.4	409.2	81.7	431.4
Pontevedra	76.5	700.3	81.6	722.5
Salamanca	75.8	416.7	78.4	419.9
Santa Cruz de Tenerife	72.2	431.4	71.2	458.9
Santander	119.1	405.8	117.0	420.7
Segovia	96.2	200.3	102.4	203.4
Sevilla	97.1	1,176.9	95.9	1,209.8
Soria	79.6	156.1	85.9	154.9
Tarragona	106.5	359.8	104.9	362.2
Teruel	72.4	228.2	73.5	225.6
Toledo	62.6	517.1	65.9	526.6
Valencia	116.7	1,388.2	124.7	1,424.3
Valladolid	112.2	354.9	108.4	362.6
Vizcaya	211.9	635.7	199.8	689.0
Zamora	73.9	313.5	70.2	318.3
Zaragoza	117.2	620.5	116.8	634.2
Spain	100.0	28,980.3	100.0	29,934.2

Y: based on national income per capita.

Source: Banco de Bilbao, *Renta Nacional de España y su Distribución Provencial*, 1955 and 1957 (Bilbao, 1956, 1958).

APPENDIX TABLE 21.

Sweden: 1944-61

	1944		1950		1955		1961	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Stockholmstad	181.8	654.9	156.3	745.9	142.9	786.0	146.0	806.9
Stockholmslän	121.0	310.0	115.6	357.9	115.4	397.1	119.5	462.9
Uppsala	99.0	143.9	99.4	154.8	100.1	161.4	98.5	167.9
Södermanlands	97.3	198.5	96.6	214.3	96.3	221.0	96.6	227.9
Östergötlands	92.4	329.3	95.5	348.0	94.7	355.3	93.8	357.8
Jönköpings	86.4	249.8	89.8	271.9	90.0	279.9	87.5	285.4
Kronobergs	71.0	153.0	78.1	157.7	82.2	159.5	82.0	159.1
Kalmar	75.9	230.0	80.7	236.8	80.4	237.1	79.0	235.6
Gotlands	71.3	59.6	80.0	59.0	79.8	56.9	74.6	54.2
Blekinge	78.8	147.2	80.3	145.9	83.6	145.4	83.6	144.5
Kristianstads	80.4	251.4	83.0	258.8	84.5	259.0	86.6	256.6
Malmöhus	115.2	546.2	111.6	583.0	106.5	601.9	105.6	626.2
Hallands	82.5	153.7	86.2	163.4	84.4	166.4	85.9	170.0
Göteborgs o. Boh.	115.8	502.4	114.8	557.3	111.6	588.0	109.7	625.3
Älvsborgs	86.9	336.4	92.0	358.5	93.3	368.1	92.4	375.0
Skaraborgs	79.7	244.1	83.3	248.6	84.6	249.2	84.9	249.9
Värmlands	79.5	271.3	87.3	280.1	95.1	288.6	92.4	291.0
Örebro	98.3	233.8	97.7	248.0	98.7	257.6	98.5	262.5
Västmanlands	98.3	179.7	96.8	203.8	100.8	218.4	94.3	233.0
Kopparbergs	85.7	253.1	87.3	267.1	89.4	279.0	89.3	286.3
Gävleborgs	81.0	274.1	86.1	285.0	93.3	292.5	88.7	293.4
Västernorrlands	75.8	276.7	83.6	283.6	89.1	289.4	87.7	285.7
Jämtlands	75.7	143.4	77.1	144.1	84.4	144.4	79.4	139.9
Västerbottens	71.7	226.8	75.4	231.7	79.7	238.3	79.5	239.7
Norrbottens	72.4	228.1	76.1	242.3	82.1	251.0	87.6	262.0
Sweden	100.0	6,597.4	100.0	7,047.6	100.0	7,291.6	100.0	7,498.7

Y: based on tax sources and defined as "assessed income" per capita.

Source: Statistiska Centralbyrån, *Skattetaxeringarna Samt Fördelningen av Inkomst och Förmögenhet (Tax years 1944, 1950, 1955, 1960)* (Stockholm, 1945, 1951, 1956, and 1962, respectively).

APPENDIX TABLE 22.

United Kingdom: 1959/60 Fiscal Year

	1959/60	
	Y	P (thou.)
Wales	84.2	2,629
Northern Region	86.9	3,246
East and West Riding	99.1	4,170
North Midland Region	99.5	3,595
Eastern Region	111.1	3,655
London and Southeastern Region	119.6	11,072
Southern Region	98.2	2,785
Southwestern Region	80.3	3,372
Midland Region	108.7	4,688
Northwestern Region	97.3	6,543
West Central Scotland	88.7	2,552
East Central Scotland	90.8	1,199
Highlands	80.4	1,203
Scottish Border Counties	81.6	306
North Ireland	63.9	1,420
United Kingdom	100.0	52,436

Y: based on net assessed income per capita from income tax sources .

Source: *One Hundred and Fifth Report of the Commissioners of Her Majesty's Inland Revenue* (London 1963), pp. 138-95; and population figures from *1960 Census of Population.*

APPENDIX TABLE 23.

West Germany: 1950-60

	1950		1951		1952	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Schleswig-Holstein	69	2,558.3	67	2,486.8	69	2,425.0
Hamburg	175	1,621.4	164	1,658.0	160	1,687.2
Niedersachsen	81	6,778.1	79	6,711.0	81	6,650.7
Bremen	144	564.9	131	581.0	136	594.0
North Rhein-Westfalen	118	13,277.2	121	13,598.8	121	13,877.9
Hessen	96	4,343.7	96	4,392.6	95	4,431.3
Rheinland-Pfalz	82	3,046.9	82	3,111.1	80	3,170.2
Baden-Würtemburg	108	6,478.4	107	6,587.4	106	6,696.8
Bayern	84	9,179.2	83	9,179.2	83	9,175.7
West Germany	100	47,848.1	100	48,305.9	100	48,708.7

	1953		1954		1955	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Schleswig-Holstein	71	2,344.7	72	2,303.5	71	2,277.3
Hamburg	157	1,722.8	158	1,752.1	159	1,781.5
Niedersachsen	83	6,605.2	83	6,569.3	83	6,548.1
Bremen	133	607.9	139	623.0	142	639.6
North Rhein-Westfalen	120	14,268.9	118	14,561.3	117	14,856.1
Hessen	95	4,478.0	97	4,520.8	96	4,577.2
Rheinland-Pfalz	79	3,225.2	78	3,266.9	79	3,304.9
Baden-Würtemburg	103	6,863.2	104	7,008.1	104	7,156.7
Bayern	83	9,162.0	84	9,158.3	84	9,176.6
West Germany	100	49,278.0	100	49,763.4	100	50,318.1

	1960	
	Y	P (thou.)
Schleswig-Holstein	79.6	2,299.2
Hamburg	176.1	1,829.5
Niedersachsen	85.5	6,553.0
Bremen	132.6	697.1
North Rhein-Westfalen	111.3	15,733.3
Hessen	98.5	4,738.3
Rheinland-Pfalz	76.9	3,393.1
Baden-Würtemburg	101.4	7,649.9
Bayern	87.0	9,428.4
West Germany	100.0	52,321.8

Y: based on net product at factor cost (excludes the Saar and West Berlin) per capita.

Source: 1950-55—"Nettoinlandsprodukt zu Factorkosten," *Wirtschaft und Statistik* (November 1957), p. 597, T-1 and T-2. 1960—*Statisches Jahrbuch, 1962,* pp. 46 and 570.

APPENDIX TABLE 24.

Yugoslavia: 1956-60

	1956	
	Y	P (thou.)
Serbia	87.6	7,293
Croatia	119.7	4,065
Slovenia	190.0	1,542
Bosnia and Hercegovina	75.2	3,082
Macedonia	75.0	1,353
Montenegro	59.3	451
Yugoslavia	100.0	17,786

	1959		1960	
	Y	P (thou.)	Y	P (thou.)
Serbia Proper	96.4	4,762	95.2	4,782
Voyvodina	114.6	1,776	108.1	1,837
Kosovo and Metohiya	43.0	894	35.4	949
Croatia	116.7	4,144	119.5	4,129
Slovenia	181.7	1,570	191.5	1,577
Bosnia and Hercegovina	75.3	3,217	76.4	3,234
Macedonia	60.4	1,389	58.3	1,396
Montenegro	55.2	468	55.4	467
Yugoslavia	100.0	18,220	100.0	18,371

Y: based on national income per capita.

Source: 1956—from *Statisticki Godisnjak FNRJ, 1958,* Savegni zavod za statisticku (Beograd, 1958), p. 325. 1960—kindly supplied to us by Dr. Ivo Vinski and has since appeared in *Statisticki Godisnjak FNRJ, 1962,* p. 345. 1959—*Statisticki Godisnjak FNRJ, 1961,* p. 350.

APPENDIX TABLE 25.

Germany ("Old Empire"): 1900-36

	1900		1907		1913		1926	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
East Prussia	84.8	2,000.0	79.6	2,043.9	72.0	2,172.8	69.5	2,278.9
West Prussia and Posen	82.9	3,447.0	77.7	3,685.7	70.6	315.7	73.8	336.1
Berlin-Brandenburg	114.0	3,887.6	120.1	4,587.6	129.2	6,433.8	131.7	6,624.0
Pommern	87.4	1,634.0	83.4	1,697.4	81.0	1,730.9	81.5	1,896.6
Schlesein	92.3	4,649.0	89.1	5,029.7	83.7	4,356.6	84.0	4,554.4
Provinz Sachsen	96.9	2,821.3	94.8	3,016.2	93.4	3,137.1	92.5	3,304.8
Schleswig-Holstein	97.4	1,380.3	97.8	1,540.1	99.7	1,504.6	102.3	1,529.4
Hannover	94.9	2,575.8	92.1	2,815.8	93.1	3,041.6	97.2	3,213.6
Westfalen	97.2	3,141.6	96.2	3,775.6	96.9	4,355.1	93.5	4,869.1
Hessen-Nassau	107.6	1,885.2	107.9	2,121.6	113.3	2,293.7	102.0	2,413.0
Rheinprovinz	101.5	5,768.4	102.4	6,717.5	106.6	6,865.4	101.5	7,388.3
Sachsen	103.6	4,169.0	104.1	4,608.2	113.1	4,938.7	116.5	5,020.7
Würtemberg	-	-	96.4	2,345.1	90.6	2,506.0	98.6	2,595.1
Baden	105.1	1,855.5	100.2	2,052.9	94.6	2,209.9	96.8	2,327.5
Hamburg	139.7	760.9	146.4	917.8	154.7	1,075.4	154.8	1,152.8
Germany	100.0	39,975.6	100.0	46,955.1	100.0	46,936.3	100.0	49,504.3

	1928		1932		1934		1936	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
East Prussia	62.9	2,269.0	83.9	2,327.1	80.8	2,354.6	73.2	2,409.1
West Prussia and Posen	65.2	338.1	82.0	348.8	80.3	341.0	68.8	345.0
Berlin-Brandenburg	138.1	6,820.6	122.8	6,847.6	124.8	6,977.3	134.8	7,042.5
Pommern	73.6	1,930.5	87.7	1,991.3	89.3	1,935.4	82.7	1,976.1
Schlesein	80.8	4,607.3	89.2	4,743.0	85.5	4,729.6	76.6	4,778.1
Provinz Sachsen	97.0	3,334.2	97.5	3,403.9	94.3	3,421.9	98.6	3,486.9
Schleswig-Holstein	97.9	1,528.4	105.0	1,690.3	104.1	1,737.3	100.9	1,480.5
Hannover	88.4	3,247.9	98.7	3,325.0	98.8	3,388.9	98.3	3,313.7
Westfalen	89.5	4,975.0	90.4	5,116.7	89.5	5,085.8	89.1	5,124.7
Hessen-Nausau	104.1	2,491.0	99.0	2,519.0	98.9	2,596.5	97.0	2,633.9
Rheinprovinz	103.3	7,491.8	98.5	7,643.2	98.6	7,759.5	99.4	7,910.5
Sachsen	123.8	5,042.2	107.0	5,097.9	107.4	5,210.7	107.5	5,226.5
Würtemberg	99.8	2,606.1	111.1	2,662.9	111.4	2,711.3	113.6	2,775.8
Baden	95.0	2,347.1	98.7	2,396.8	97.4	2,426.7	95.2	2,462.5
Hamburg	156.9	1,205.2	134.1	1,222.8	130.6	1,221.6	146.9	1,648.5
Germany	100.0	50,234.4	100.0	51,336.3	100.0	51,898.1	100.0	52,614.1

Y: based on national income per capita.

Note: Because of continuing boundary change during this period of German history, construction of an index of inequality over time for a geographically unique "Germany" is difficult. Note, for example, the sharp population decline in the province "West Prussia and Posen" between 1907 and 1913.

Source: "Das deutsch Volkseinkommen vor und nach dem Kriege," *Eingelschriften zur Statistik des Deutsches Reichs*, No. 24, Statistichen Reichsamt (Berlin 1932), Table 12, 15, and 16, pp. 72 and 76; *Wirtschaft und Statistik*, Statistichen Reichsamt (Berlin 1936), p. 565; *Statistichen Jahrbuch für das Deutsche Reich*, Statistichen Reichsamt (Berlin 1932), Table F-16, p. 525.

APPENDIX TABLE 26.

Canada: 1926-45

	1926		1930		1935	
	Y	P (thou.)	Y	P (thou.)	Y	P (thou.)
Prince Edward Island	56.7	87	56.2	88	56.3	92
Nova Scotia	67.1	515	72.7	514	76.7	536
New Brunswick	64.2	396	65.4	406	64.4	428
Quebec	84.7	2,603	91.8	2,825	90.6	3,057
Ontario	114.4	3,164	123.5	3,386	126.9	3,575
Manitoba	108.7	639	98.6	689	90.3	710
Saskatchewan	102.4	821	61.2	903	63.1	930
Alberta	113.4	608	90.1	708	79.0	765
British Columbia	121.2	618	126.4	689	127.8	752
Canada	100.0	9,451	100.0	10,208	100.0	10,845

	1940		1945	
	Y	P (thou.)	Y	P (thou.)
Prince Edward Island	51.2	95	60.5	92
Nova Scotia	77.3	569	80.9	619
New Brunswick	65.0	452	70.9	467
Quebec	85.9	3,278	80.8	3,560
Ontario	125.9	3,747	121.1	4,000
Manitoba	91.2	728	94.0	727
Saskatchewan	71.1	900	84.4	833
Alberta	90.7	790	91.7	808
British Columbia	121.8	822	114.0	966
Canada	100.0	11,381	100.0	12,702

Y: based on personal income per capita.

Note: Newfoundland does not become a formal member of the federation until 1949. The Yukon and Northwest Territories are included under British Columbia.

Source: Dominion Bureau of Statistics, *National Accounts, Income, and Expenditure, 1926-1956* (Ottawa 1958), Table 29 and Appendix Table 1, pp. 64-65 and 100-01.

APPENDIX TABLE 27.

Sweden: 1920-30

	1920		1930	
	Y	P (thou.)	Y	P (thou.)
Stockholmstad	240.5	419.4	264.2	503.7
Stockholmslän	120.8	243.2	128.7	264.1
Uppsala	99.9	136.7	90.4	141.3
Södermanlands	82.6	190.5	86.6	190.4
Östergötlands	82.6	305.7	86.1	307.1
Jönköpings	75.0	227.6	70.7	233.4
Kronobergs	66.5	158.6	57.5	153.6
Kalmar	68.0	231.1	64.2	233.4
Gotlands	52.3	55.9	58.1	55.3
Blekinge	70.7	147.1	67.2	147.4
Kristianstads	69.7	241.0	66.8	245.7
Malmöhus	120.4	487.5	118.4	509.8
Hallands	71.6	148.7	75.4	147.4
Göteborgs o. Boh.	132.0	424.8	132.2	454.5
Älvsborgs	75.3	300.4	79.6	313.3
Skaraborgs	61.9	243.8	64.8	239.5
Värmlands	78.6	268.7	72.3	270.3
Örebro	100.1	218.5	88.3	221.1
Västmanlands	92.9	168.8	87.8	159.7
Kopparbergs	87.1	254.3	77.4	251.8
Gävleborgs	91.9	268.3	79.3	282.5
Västernoorlands	88.5	265.2	77.1	276.4
Jämtlands	75.0	133.5	59.3	135.1
Västerbottens	64.6	182.2	59.0	202.7
Norrbottens	71.6	183.0	65.7	202.7
Sweden	100.0	5,904.5	100.0	6,142.2

Y: based on assessed income per capita.

Source: Statistiska Centralbryån, *Folkrakningen den 31 December 1920,* IV (Stockholm, 1926), Tables F and A, pp. 38-39 and 22-23. Statistiska Centralbryån, *Folkrakningen den December 1930,* VIII (Stockholm, 1938), Tables Ae and G, pp. 86-87, 16, and xv.

APPENDIX TABLE 28.

Italy: 1928-38

	1928		1938	
	Y	P (thou.)	Y	P (thou.)
Piemonte	155.6	3,463	165.3	3,530
Liguria	144.6	1,407	147.5	1,503
Lombardia	142.1	5,409	146.3	5,875
Trentino-Alto Adige	110.7	654	105.9	703
Veneto	79.5	4,087	83.0	4,254
Friuli-Ven. Giulia	100.9	964	103.4	1,021
Emilia-Romagna	103.9	3,161	103.4	3,324
Marche	75.6	1,197	74.4	1,269
Toscana	107.0	2,852	107.4	2,968
Umbria	94.8	678	95.5	730
Lazio	109.9	2,257	103.0	2,767
Campania	75.8	3,370	71.5	3,751
Abruzzi e Molise	63.2	1,457	57.2	1,572
Puglia	69.3	2,402	65.1	2,679
Basilicata	66.9	493	61.0	546
Calabria	59.4	1,604	54.6	1,761
Sicilia	69.7	3,824	71.3	3,985
Sardegna	75.0	939	70.2	1,054
Italy	100.0	40,218	100.0	43,292

Y: based on net national product per capita.

Source: Svimez, *Un Secolo Di Statistiche Italiane Nord e Sud, 1861-1961* (Roma, 1961), Capitolo XI, Tav. 395, p. 770.

APPENDIX TABLE 29.

Finland: $\frac{A}{L}$, 1950 (percent)

	1950
Södra Finlands Kustland	16.0
Tammerfors' Regionen	11.8
Sydvästra Finlands Kustland	31.4
Villmanstrand-Imatra Regionen	22.8
Uleåborgs Regionen	34.9
Kumo Älvdal	36.0
Vasa Regionen	52.9
Jyväskylä-Mäntta Regionen	35.0
Kemi och Torneå Älvdalar	44.9
Loimaa-Karkkila Storregionen	63.1
Kajana Regionen	56.7
Kuopio Regionen	52.5
Södra Tavastlands Storregionen	63.3
Tavastkyro Regionen	66.0
Södra Savolaks Storregionen	60.5
Luumäki Regionen	79.4
Sydvästra Finlands Skärgård	58.0
Kalajokki Regionen	68.9
Eurajokki-Urjala Regionen	68.7
Suomenselka Storregionen	76.0
Norra Karelens Storregionen	75.7
Norra Lapplands Regionen	70.1
Kainuu-Kuusamo Regionen	79.3
Finland	46.0

Source: Lars Wahlbeck, *Om Inkomstnivåns Geografi i Finland år 1950,* Vol. 1 and 2, Ekonomi och Samhalle, Skrifter utgivna av Svenska Handelskogskolan, No. 2 (Helsingfors, 1955), Table 11, pp. 576-77.

APPENDIX TABLE 30.

Brazil: $\frac{A}{L}$, 1920-50 (percent)

	1920	1940	1950
Est. du Guanabara	-	-	-
São Paulo	63	55	45
Parana	75	71	68
Rio Grande do Sul	65	65	59
Santa Catarina	78	70	63
Rio de Janeiro	68	54	41
Espirito Santo	82	78	72
Minas Gerais	79	73	67
Bahia	72	73	71
Sergipe	71	68	66
Amazonas	75	45	37
Para	73	54	47
Mato Grosso	68	57	62
Goias	78	78	82
Pernambuco	75	70	66
Rio Grande do Norte	78	76	73
Paraiba	85	82	78
Ceara	78	74	75
Alagoas	83	73	73
Maranhão	78	72	74
Piaui	72	76	81
Brazil	69.1	64.5	57.9

Source: Joint Brazil-United States Economic Development Commission, *The Development of Brazil* (Washington, D.C., 1953), T-viii and T-xi, pp. 291-92.

APPENDIX TABLE 31.

Spain: $\frac{A}{L}$, 1957 (percent)

	1957		1957
Álava	27.1	Logroño	53.7
Albacete	70.7	Lugo	68.5
Alicante	50.4	Madrid	6.2
Almería	65.8	Málaga	57.8
Ávila	72.4	Murcia	62.6
Badajoz	71.2	Navarra	49.1
Baleares	40.7	Orense	77.7
Barcelona	7.9	Oviedo	36.1
Burgos	51.1	Palencia	45.6
Cáceres	73.4	Las Palmas	61.2
Cádiz	44.2	Pontevedra	63.5
Castellón	61.8	Salamanca	55.2
Ciudad Real	67.1	Santa Cruz de Tenerife	65.2
Córdoba	66.2		
Coruña	62.8	Santander	37.7
Cuenca	71.9	Segovia	54.4
Gerona	32.9	Sevilla	43.1
Granada	69.7	Soria	57.1
Guadalajara	66.3	Tarragona	55.0
Guipúzcoa	11.1	Teruel	64.1
Huelva	55.2	Toledo	72.5
Huesca	61.3	Valencia	47.6
Jaén	72.3	Valladolid	39.6
León	56.7	Vizcaya	9.2
Lérida	54.4	Zamora	62.1
		Zaragoza	43.1
		Spain	46.0

Source: Banco de Bilbao, *Renta Nacional de España y su Distribucion Provincial, 1957* (Bilbao, 1958), pp. 46-47.

APPENDIX TABLE 32.

Japan: $\frac{A}{L}$, 1959 (percent)

	1959		1959
Hokkaido	35.0	Mie-ken	41.6
Aomori-ken	52.7	Shiga-ken	48.9
Iwate-ken	55.3	Kyoto-fu	20.4
Miyagi-ken	45.5	Osaka-fu	6.2
Akita-ken	55.1	Hyogo-ken	24.8
Yamagata-ken	53.0	Nara-ken	37.1
Fukushima-ken	54.0	Wakayama-ken	37.7
Ibaraki-ken	59.5	Tottori-ken	53.3
Tochigi-ken	50.8	Shimane-ken	56.5
Gumma-ken	47.2	Okayama-ken	48.4
Saitama-ken	39.5	Hiroshima-ken	36.2
Chiba-ken	49.7	Yamaguchi-ken	36.3
Tokyo-to	3.3	Tokushima-ken	51.0
Kanagawa-ken	11.2	Kagawa-ken	44.4
Niigata-ken	48.7	Ehime-ken	44.0
Toyama-ken	42.1	Kochi-ken	48.5
Ishikawa-ken	36.0	Fukuoka-ken	22.9
Fukui-ken	40.9	Saga-ken	46.7
Yamanashi-ken	48.8	Nagasaki-ken	38.1
Nagano-ken	54.8	Kumamoto-ken	54.2
Gifu-ken	41.7	Oita-ken	52.0
Shizuoka-ken	33.9	Miyazaki-ken	56.2
Aichi-ken	21.2	Kagoshima-ken	60.6
		Japan	35.6

Source: Derived from unpublished data of the Economic Research Institute of the Japanese Economic Planning Agency. They were kindly made available by Mr. Tsunehiko Watanabe.

APPENDIX TABLE 33.

Sweden: $\frac{A}{L}$, 1940 (percent)

	1940
Stockholmstad	0.9
Stockholmslän	23.1
Uppsala	36.3
Södermanlands	34.8
Östergötlands	32.6
Jönköpings	34.8
Kronobergs	46.7
Kalmar	41.5
Gotlands	48.2
Blekinge	29.7
Kristianstads	42.9
Malmöhus	23.6
Hallands	43.2
Göteborgs o. Boh.	15.1
Älvsborgs	35.2
Skaraborgs	46.8
Värmlands	41.2
Örebro	28.2
Västmanlands	30.2
Kopparbergs	35.3
Gävleborgs	34.8
Västernorrlands	39.1
Jämtlands	55.6
Västerbottens	57.4
Norrbottens	47.2
Sweden	31.9

Source: Statistiska Centralbryån, *Statistisk Arsbok för Sverige, 1945* (Stockholm, 1945), Table 27, pp. 36-37.

APPENDIX TABLE 34.

Great Britain: $\frac{A}{L}$, 1951 (percent)

	1951
Northern Region	16.4
East and West Ridings	9.6
Northwestern Region	4.0
North Midlands	13.8
Midlands	7.0
Eastern Region	12.8
London and Southeastern Region	2.6
Southern Region	7.9
Southwestern Region	12.1
Wales	18.4
Great Britain	8.2

Source: *Census of England and Wales 1951*, Occupational Tables (London, 1956), Table 20, pp. 152-67.

APPENDIX TABLE 35.

Austria: $\frac{A}{L}$, 1951 (percent)

	1951
Wien	1.2
Vorarlberg	20.3
Salzberg	26.0
Tirol	30.7
Kärnten	31.6
Oberösterreich	33.1
Steiermark	36.2
Niederösterreich	38.5
Burgenland	57.1
Austria	26.6

Source: Österreichischen Statistischen Zentralamt, *Statistiches Handbüch für die Republik Österreich, 1958* (Wien, 1958), Table 15, p. 17.

APPENDIX TABLE 36.

Canada: $\frac{A}{L}$, 1901-51 (percent)

	1901	1911	1921	1931	1941	1951
Prince Edward Island	66.8	66.3	63.6	61.6	59.1	44.4
Nova Scotia	50.3	48.3	42.3	40.1	35.7	23.2
New Brunswick	48.1	45.0	41.2	39.0	40.6	28.1
Quebec	40.0	34.6	30.3	25.0	25.5	16.9
Ontario	42.2	34.1	28.0	24.9	21.7	13.0
Manitoba	55.8	40.2	40.5	36.7	38.1	26.5
Saskatchewan	68.8	65.2	65.7	61.2	60.8	49.8
Alberta	a	54.0	57.2	55.0	53.1	35.6
British Columbia	35.9	27.3	28.6	24.9	24.3	13.6
Canada	44.2	39.4	36.4	32.6	30.7	19.8

a. Included in Saskatchewan. The Northwest Territories are included in Alberta throughout.

Source: Dominion Bureau of Statistics, *Census of Canada, 1951* (Ottawa, 1953), Vol. IV, Table 2.

APPENDIX TABLE 37.

Italy: $\frac{A}{L}$, 1861-1951 (percent)

	1861	1871	1881	1901	1911
Piemonte/Valle d'Aosta	65.9	67.2	61.9	61.6	55.4
Liguria	52.8	55.3	46.6	42.1	35.2
Lombardia	57.7	55.6	52.3	50.0	43.4
Veneto	65.4	62.8	59.8	63.1	61.1
Emilia-Romagna	59.7	58.0	55.5	63.5	58.3
Marche	66.2	66.5	62.0	70.5	67.3
Toscana	57.7	56.6	52.2	57.7	51.0
Umbria	74.9	69.9	67.8	73.7	69.5
Lazio	57.9	54.5	49.5	52.6	44.9
Campania	52.2	51.2	45.1	55.2	53.5
Abruzzi e Molise	69.5	71.0	62.5	77.5	77.2
Puglia	60.4	57.5	50.8	64.1	63.2
Basilcata	66.8	64.8	61.4	77.2	76.6
Calabria	57.5	45.6	44.1	62.6	67.3
Sicilia	47.2	44.5	44.3	53.5	53.4
Sardegna	62.1	66.4	54.3	62.9	59.1
Italy	59.6	57.9	53.4	59.4	55.5

	1921	1931	1936	1951
Piemonte/Valle d'Aosta	53.3	41.2	42.7	32.8
Liguria	32.1	24.5	25.3	18.0
Lombardia	39.9	28.4	28.6	20.1
Veneto	59.0	52.0	53.2	42.6
Emilia-Romagna	62.3	57.9	58.7	51.8
Marche	69.8	64.3	66.7	60.2
Toscana	53.5	45.6	47.6	39.6
Umbria	70.3	63.1	64.6	56.2
Lazio	43.9	40.0	41.7	33.1
Campania	54.3	44.6	48.3	46.4
Abruzzi e Molise	78.1	71.6	74.4	64.7
Puglia	63.6	54.6	53.2	58.2
Basilicata	78.3	70.6	75.5	73.2
Calabria	73.4	64.4	68.0	63.3
Sicilia	56.9	51.8	51.4	51.2
Sardegna	60.4	58.0	56.9	51.0
Italy	55.8	47.0	48.4	42.6

Source: Svimez, *Cento Anni Di Statistiche Sulle Regioni D'Italia* (Rome, 1961), Table 10, pp. 18-22.

APPENDIX TABLE 38.

Austria: Income per Worker, 1957

	Total income per worker
Wien	129.1
Niederoesterreich	82.3
Oberoesterreich	92.8
Steiermark	90.1
Tirol	102.6
Kärnten	93.3
Salzburg	105.3
Voralberg	121.8
Burgenland	61.7
Austria	100.0

Note: This estimate uses the 1951 labor participation rate.

Source: Österreichischen Statistischen Zentralamt, *Statistiches Handbuch fur Die Republik Osterreich, 1958* (Wien, 1958), p. 10.

APPENDIX TABLE 39.

Canada: Income per Worker, 1951

	Total income per worker
Prince Edward Island	56.3
Nova Scotia	72.7
New Brunswick	66.7
Quebec	80.9
Ontario	111.9
Manitoba	99.9
Saskatchewan	120.8
Alberta	114.6
British Columbia[a]	123.3
Canada	100.0

a. British Columbia includes Yukon and Northwest Territories. Newfoundland is excluded from total.

Source: Dominion Bureau of Statistics, *National Accounts: Income and Expenditure, 1926-1956* (Ottawa, 1958), T-28, Appendix T-1, pp. 64-65 and 100-01; R. D. Howland, *Some Regional Aspects of Canada's Economic Development* (Ottawa, 1957), T-23, p. 78.

APPENDIX TABLE 40.

Australia: Income per Worker, 1954/55

	Total income per worker
New South Wales	102.2
Victoria	100.3
Queensland	96.3
South Australia[a]	98.9
Western Australia	96.1
Tasmania	94.5
Australia	100.0

a. South Australia includes Northern Territory.

Source: Commonwealth Bureau of Census and Statistics; Mr. G. M. Neutze was especially helpful in securing this data for us.

APPENDIX TABLE 41.

Colombia: Income per Worker, 1951

	Total income per worker
Antioquia	144.3
Atlantico	168.8
Bolivar	43.8
Boyaca	35.2
Caldas	93.0
Cauca	34.2
Caudinamarca	163.0
Choco	15.5
Huila	43.0
Nariño	34.0
Colombia	100.0

Note: The computation of V_w in column (4) of Table 7 is especially suspect for Colombia. First, the labor force estimates are for 1951, while income is for 1953. Second, we have information only for ten of the sixteen departments.

Source: *Estudio Sobre las Condiciones del Desarrollo de Colombia,* Mision "Economia y Humanismo" (Bogata, 1958), Table 25 and 5, pp. 326 and 35.

APPENDIX TABLE 42.

Finland: Income per Worker, 1958

	Industrial income per industrial worker (1)	Agricultural income per agricultural worker (2)	Total income per worker (3)
Nyland	119.3	136.7	139.5
Egentliga Finland	97.7	121.6	102.5
Åland	73.6	119.8	106.3
Satakunda	93.7	104.6	94.5
Södra Tavastland	85.0	117.9	93.0
Tammerland	98.6	108.3	99.0
Sydöstra Finland	103.3	105.7	98.5
Mellersta Finland	86.0	93.9	81.1
Södra Savolax	85.5	92.9	78.4
Norra Savolax	79.7	84.3	73.2
Norra Karelen	118.9	81.4	76.4
Södra Österbotten	81.3	95.6	81.2
Mellersta Österbotten	70.3	87.9	70.5
Norra Österbotten	95.7	88.9	93.2
Kajanaland	99.0	89.5	80.4
Lappland	101.0	93.9	91.8
Finland	100.0	100.0	100.0

Note: "Industry" includes handicraft.

Source: Finlands Officiella Statistik, *Inkomst-och Förmögenhetsstatistik, 1958,* (Helsinki, 1961), Table 2, pp. 52-53.

APPENDIX TABLE 43.

France: Income per Worker, 1951

	Industrial product per industrial worker (1)	Agricultural product per agricultural worker (2)	Total product per worker (3)
Ain	90.2	115.0	90.6
Aisne	109.9	150.8	113.4
Allier	83.2	90.7	80.4
Alpes (Basses)	95.4	149.2	98.1
Alpes (Hautes)	95.4	67.3	82.1
Alpes-Maritimes	53.4	99.5	74.9
Ardèche	106.9	64.2	81.1
Ardennes	109.2	125.9	113.0
Ariège	104.6	60.1	73.2
Aube	102.3	119.7	102.8
Aude	77.1	119.7	88.9
Aveyron	79.4	60.6	72.1
Bouches-du-Rhône	74.0	168.4	105.8
Calvados	95.4	92.7	83.6

Appendix Table 43 (continued)

	(1)	(2)	(3)
Cantal	62.6	95.3	71.3
Charente	80.2	81.9	75.7
Charente-Maritime	67.9	87.6	73.0
Cher	76.3	103.6	83.0
Corrèze	78.6	70.5	67.9
Corse	32.1	59.6	54.2
Côte-d'Or	87.8	114.5	100.0
Côtes-du-Nord	47.3	75.1	59.8
Creuse	45.8	90.7	66.6
Dordogne	59.5	95.9	71.5
Doubs	156.5	102.1	133.2
Drôme	85.5	52.8	88.7
Eure	90.1	124.9	87.2
Eure-et-Loir	100.8	119.7	94.7
Finistère	58.8	84.5	70.0
Gard	86.3	142.5	102.1
Garonne (Haute)	101.5	76.2	96.2
Gers	62.6	100.0	69.8
Gironde	80.2	78.2	83.8
Hérault	77.1	159.1	106.0
Ille-et-Vilaine	58.8	73.6	63.6
Indre	58.8	80.8	63.4
Indre-et-Loire	69.5	94.3	77.7
Isère	122.9	94.8	110.6
Jura	88.5	109.8	90.8
Landes	85.5	66.8	64.2
Loir-et-Cher	58.8	79.3	64.0
Loire	111.5	94.8	111.3
Loire (Haute)	77.1	90.2	73.6
Loire-Inférieure	86.3	118.1	93.0
Loiret	77.9	102.6	82.3
Lot	61.8	79.8	68.1
Lot-et-Garonne	96.9	88.6	77.5
Lozère	64.9	65.3	59.1
Maine-et-Loire	84.0	72.5	69.7
Manche	69.5	80.3	67.0
Marne	77.1	158.5	100.8
Marne (Haute)	83.2	157.5	99.4
Mayenne	68.7	60.6	55.3
Meurthe-et-Moselle	111.5	14.5	122.3
Meuse	76.3	203.6	105.5
Morbihan	51.1	61.1	54.7
Moselle	106.9	190.7	119.8
Nièvre	78.6	102.6	85.7
Nord	139.7	181.9	143.0
Oise	117.6	180.3	127.0
Orne	76.3	88.1	70.9
Pas-de-Calais	115.3	119.7	115.3
Puy-de-Dôme	105.3	80.8	91.5
Pyrénées (Basses)	80.2	85.5	74.9
Pyrénées (Hautes)	148.9	66.8	104.9
Pyrénées-Orientales	72.5	201.0	114.3

Appendix Table 43 (continued)

	(1)	(2)	(3)
Rhin (Bas)	89.3	106.7	99.2
Rhin (Haut)	95.4	86.5	100.6
Rhône	114.5	94.3	113.4
Saône (Haute)	98.5	99.5	91.5
Saône-et-Loire	96.9	82.9	86.6
Sarthe	77.0	86.0	77.5
Savoie	116.8	68.9	92.5
Savoie (Haute)	106.9	92.7	91.9
Seine	126.0	65.3	148.1
Seine-Maritime	103.1	129.5	107.0
Seine-et-Marne	93.1	205.7	109.2
Seine-et-Oise	64.9	154.4	74.9
Sèvres (Deux)	63.4	105.7	76.4
Somme	108.4	140.4	108.9
Tarn	108.4	90.2	88.5
Tarn-et-Garonne	90.8	76.7	70.8
Var	82.4	131.1	91.1
Vaucluse	72.5	139.4	92.6
Vendée	53.4	71.5	53.4
Vienne	60.3	103.6	75.1
Vienne (Haute)	62.6	62.7	66.6
Vosages	113.7	133.7	115.3
Yonne	80.9	107.8	79.8
Belfort	129.0	97.4	132.1
France	100.0	100.0	100.0

Note: Columns 3 to 6 of Table 7 are all based in 1951 product, rather than income, data. "Industrial" product and labor force estimates include manufacturing, mining, and power.

Source: *Etudes et Conjuncture* (Supplement), 1955, pp. 18-19 and 85-87.

APPENDIX TABLE 44.

Italy: Income per Worker, 1960

	Industrial income per industrial worker (1)	Agricultural income per agricultural worker (2)	Total income per worker (3)
Piemonte	120.5	114.6	124.5
Valle d'Aosta	159.5	91.2	147.1
Lombardia	120.8	178.5	140.0
Trentino-Alto Adige	93.8	111.9	95.8
Veneto	90.5	133.9	98.6
Friuli-Venezia G.	92.7	95.8	99.1
Liguria	128.5	204.3	149.1
Emilia-Romagna	96.6	138.9	102.4
Toscana	95.4	91.9	96.4
Umbria	78.2	65.2	66.9
Marche	69.8	64.8	58.7
Lazio	128.2	122.9	134.6
Abruzzi e Molise	66.7	63.5	55.7
Campania	77.0	74.9	74.7
Puglia	73.7	85.2	68.9

Appendix Table 44 (continued)

	(1)	(2)	(3)
Basilicata	54.7	54.4	45.3
Calabria	55.6	59.1	50.5
Sicilia	79.4	78.3	74.7
Sardegna	88.5	102.3	85.8
Italy	100.0	100.0	100.0

Note: "Industrial" in Tagliacarne's data includes all non-agricultural sectors.

Source: G. Tagliacarne, "Calcolo del reddito prodotto nelle provincie e regioni d'Italia nel 1960," *Moneta e Credito* (December 1961), T-24, pp. 44-46 and 48-50.

APPENDIX TABLE 45.

Japan: Income per Worker, 1959

	Industrial product per industrial worker (1)	Agricultural product per agricultural worker (2)	Total product per worker (3)
Hokkaido	95.7	148.2	105.7
Aomori-ken	59.8	115.9	72.3
Iwate-ken	67.1	85.8	64.1
Miyagi-ken	73.8	125.5	86.0
Akita-ken	87.1	119.5	76.7
Yamagata-ken	69.8	96.4	72.8
Fukushima-ken	66.9	92.3	73.8
Niigata-ken	79.6	98.3	76.4
Ibaraki-ken	87.7	96.8	72.7
Tochigi-ken	69.5	105.8	72.5
Gumma-ken	59.5	103.5	70.2
Saitama-ken	78.4	79.4	82.1
Chiba-ken	73.1	88.2	66.2
Tokyo-to	138.7	136.0	182.6
Kanagawa-ken	144.9	127.1	154.8
Yamanashi-ken	55.6	96.0	68.3
Nagano-ken	65.0	91.4	71.0
Shizuoka-ken	95.2	125.0	95.6
Toyama-ken	91.3	89.4	88.2
Ishikawa-ken	78.2	112.5	84.7
Gifu-ken	68.4	81.9	73.8
Aichi-ken	89.9	99.3	110.8
Mie-ken	113.4	80.7	79.1
Fukui-ken	60.9	103.6	74.9
Shiga-ken	96.4	97.1	81.5
Kyoto-fu	84.5	96.4	107.5
Osaka-fu	120.6	105.6	160.4
Hyogo-ken	147.8	89.2	118.1
Nara-ken	54.4	132.6	86.6
Wakayama-ken	75.6	120.6	84.4
Tottori-ken	81.5	101.6	67.6
Shimane-ken	72.7	97.2	66.0
Okayama-ken	78.7	87.7	76.6
Hiroshima-ken	78.0	92.9	84.6

Appendix Table 45 (continued)

	(1)	(2)	(3)
Yamaguchi-ken	108.9	101.1	84.8
Tokushima-ken	64.8	87.5	70.4
Kagawa-ken	93.4	94.3	81.8
Ehime-ken	92.5	103.9	85.0
Kochi-ken	59.6	109.0	71.3
Fukuoka-ken	101.0	110.7	113.7
Saga-ken	60.3	103.4	70.1
Nagasaki-ken	88.5	74.2	83.6
Kumamoto-ken	90.9	88.8	67.9
Oita-ken	82.1	90.6	76.5
Miyazaki-ken	53.1	85.2	62.6
Kagoshima-ken	49.0	73.2	51.9
Japan	100.0	100.0	100.0

Note: "Industrial" sector includes mining, manufacturing, and construction.

Source: Derived from unpublished data of the Economic Research Institute of the Japanese Economic Planning Agency. They were kindly made available to us by Mr. Tsunehiko Watanabe.

APPENDIX TABLE 46.

Spain: Income per Worker, 1957

	Industrial income per industrial worker (1)	Agricultural income per agricultural worker (2)	Total income per worker (3)
Álava	111.3	140.3	120.5
Albacete	100.2	110.7	76.4
Alicante	71.4	56.8	66.7
Almería	97.4	72.3	67.0
Ávila	106.9	97.0	67.7
Badajoz	91.5	137.1	85.0
Baleares	91.3	85.1	100.8
Barcelona	91.5	122.6	132.8
Burgos	103.0	158.3	105.2
Cáceres	89.5	87.0	62.1
Cádiz	93.5	87.0	115.0
Castellón	81.0	91.4	76.4
Ciudad Real	114.7	94.0	73.2
Córdoba	80.9	72.3	66.5
Coruña	82.3	81.9	74.8
Cuenca	129.8	141.3	85.5
Gerona	78.5	111.7	89.9
Granada	105.7	56.8	61.8
Guadalajara	136.9	131.5	90.7
Guipúzcoa	132.8	338.8	168.8
Huelva	91.9	131.6	96.1
Huesca	150.3	92.0	97.9
Jaén	92.6	56.7	52.7

Appendix Table 46 (continued)

	(1)	(2)	(3)
León	93.3	74.3	74.9
Lérida	106.7	105.1	87.3
Logroño	119.1	126.3	100.3
Lugo	127.1	152.4	93.4
Madrid	94.3	137.6	149.1
Málaga	92.8	70.4	84.0
Murcia	98.6	49.1	66.8
Navarra	112.1	135.2	103.1
Orense	105.7	44.2	44.4
Oviedo	101.7	114.4	118.8
Palencia	98.7	178.5	112.5
Las Palmas	92.6	123.0	87.0
Pontevedra	93.5	87.7	73.3
Salamanca	96.4	123.4	90.9
Santa Cruz de Tenerife	142.3	102.6	93.6
Santander	123.2	108.2	82.6
Segovia	100.3	222.0	118.3
Sevilla	96.3	100.8	110.9
Soria	98.9	206.6	109.7
Tarragona	112.2	116.9	108.2
Teruel	92.8	100.7	71.0
Toledo	101.6	105.4	72.7
Valencia	110.7	123.5	114.9
Valladolid	98.7	161.6	111.5
Vizcaya	114.6	242.7	159.2
Zamora	207.4	112.4	97.3
Zaragoza	104.9	88.2	105.0
Spain	100.0	100.0	100.0

Note: In Table 1 we used income per capita to compute V_w; here we have used value of product per laborer. The provincial distribution of income is not the same as that of value of product, but for our purposes they are not statistically different.

Source: Banco de Bilbao, *Renta Nacional de España y su Distribución Provencial (1957)* (Bilbao, 1958), pp. 20-21 and 46-47.

APPENDIX TABLE 47.

Sweden: Income per Worker, 1944

	Income per worker
Stockholmstad	146.1
Stockholmslän	121.5
Uppsala	103.3
Södermanlands	99.6
Östergötlands	93.9
Jönköpings	88.4
Kronobergs	76.1
Kalmar	83.3
Gotlands	75.0
Blekinge	85.1
Kristianstands	84.8
Malmöhus	111.8
Hallands	83.3
Göteborgs o. Boh.	112.4
Älvsborgs	83.3
Skaraborgs	81.6
Värmlands	82.5
Örebro	97.0
Västmanlands	100.6
Kopparbergs	87.1
Gävleborgs	85.8
Västernorrlands	83.2
Jämtlands	78.6
Västerbottens	80.2
Norrbottens	85.6
Sweden	100.0

Note: Labor force figures are derived using 1940 participation rate.

Source: Statistiska Centralbryån, *Skattetaxeringarna Samt Fördelningen av Inkmost och Förmögenhet 1945* (Stockholm, 1945), Table 10, p. 79; *Statistiks Arsbok för Sverige, 1945* (Stockholm, 1945), Table 27, pp. 36-37.

APPENDIX TABLE 48.

Yugoslavia: Income per Worker, 1959

	Industrial income per industrial worker (1)	Agricultural income per Agricultural worker (2)	Total income per worker (3)
Serbia Proper	99.9	200.9	108.5
Voyvodina	72.0	65.9	94.8
Kosovo and Metohiya	88.3	106.1	84.0
Croatia	106.4	92.0	101.1
Slovenia	126.9	80.2	110.1
Bosnia and Hercegovia	88.9	158.2	97.3
Macedonia	76.6	55.7	73.1
Montenegro	80.2	131.5	69.7
Yugoslavia	100.0	100.0	100.0

Source: *Statisticki godisnjak RNRJ, 1961* (Beograd, 1961), pp. 316 and 350.

APPENDIX TABLE 49.

Brazil: Income per Worker, 1950

	Industrial income per industrial worker (1)	Agricultural income per agricultural worker (2)	Total income per worker (3)
Amazonas	116.6	75.6	106.1
Para	126.3	36.0	61.4
Maranhão	81.4	30.3	35.2
Piaui	35.9	26.9	31.5
Ceara	40.9	57.5	50.2
Rio Grande do Norte	60.2	70.1	57.3
Paraiba	47.5	65.9	51.2
Pernambuco	65.7	44.0	58.9
Algoas	51.4	47.0	43.2
Sergipe	48.1	40.1	47.5
Bahia	51.8	49.9	50.4
Minas Gerais	78.5	101.6	76.1
Espirito Santo	82.5	106.6	78.0
Rio de Janeiro	80.7	122.7	101.5
Est. du Guanabara	145.0	417.4	264.4
São Paulo	121.6	202.5	159.6
Parana	80.6	176.8	114.2
Santa Catarina	87.4	113.0	88.2
Rio Grande do Sul	102.1	130.0	106.9
Mato Grosso	85.7	83.0	76.8
Goias	61.6	82.4	58.1
Brazil	100.0	100.0	100.0

Source: *Revista Brasileira de Economia,* Ano 14, No. 1 (March, 1960), p. 119; and *Annuario Estatistico de Brasil, 1960.*