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**REGIONAL ECONOMIC GROWTH IN THE PHILIPPINES, 1948-1966**  
Part I: Dimensions of Regional Growth

by

**Gerardo P. Sicat**

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To be a part of a forthcoming book of essays by *G.P. Sicat on Industrial Export Growth, Investment Incentives, and Philippine Economic Development*

## REGIONAL ECONOMIC GROWTH IN THE PHILIPPINES, 1948-1966

### Part I: Dimensions of Regional Growth

by *Gerardo P. Sicat*\*

#### I. INTRODUCTION

Little is known about the economic performance of the different regional economies of the Philippines. This present state of knowledge about regional economies is due in part to a lack of regional orientation of economic policies. As an indication of this, no regional economic accounts have been constructed for the Philippines. Thus, up to now, little is known about how much is the relative size of one regional economy compared to another.

This paper represents an attempt to quantify the dimensions of growth of the different regional segments of the country by relating them to national economic growth. A succeeding paper will analyze the reasons for these dimensions of growth and make policy suggestions towards emphasizing regional economic growth.

To accomplish the major objective of quantifying growth by regions, this paper will show the direction of economic growth

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of the regional economies and of their relative total and per capita gross output levels. In order to achieve this, a prodigious job of constructing regional economic accounts would be necessary. We choose here a method of estimating gross regional product which is simple and readily made once the key data are available.<sup>1</sup> Given limited time and the need for important information on the subject matter, we believe this simple method is probably preferable to the more expensive, time-consuming, and laborious task of building specific regional economic accounts. This excuse, while valid for the single researcher whose interests are diverse, cannot be used by agencies whose work it is to compile economic accounts for the country.

## II. USE OF PROXY INFORMATION

To make an approximation of regional income changes, data on local public finance will be utilized as surrogate information. The choice of these data depends on the wellknown result that fiscal data -- taxes and expenditures -- move in the same direction as incomes. Thus, with some adjustments,

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<sup>1</sup>A similar method applied to measuring long run output for the Philippine economy is described in G.P. Sicat, "On the Measurement of Long Term Output," *Conference on Growth of Output in the Philippines* (December 9-10, 1966, Los Baños, Laguna), forthcoming in *The Philippine Economic Journal*.

fiscal data may be used as surrogates for output, which will be assumed to be gross product. At some later point, comparisons will be made with estimates of output based on independent statistical information.

Local public finance data are taken from the General Auditing Office. Gross revenue and expenditure data of local governments provide the data basis of this study.<sup>2</sup> It is essential to enumerate the limitations of our current method for measuring regional gross product (GRP). Firstly, tax data are likely to be poor indicators of GRP levels because of differences in the collecting efficiency of each local government. The poorer and more remote an area, the less is the efficiency of the administrative machinery. Secondly, inter-temporal tax data may include changes in the structure of the tax system between the periods examined. Some local governments may have raised local tax rates or tapped new sources of taxes. Thirdly, between the two periods, the collecting efficiency of local governments may have improved. However, the changes in collecting

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<sup>2</sup>The following are the definitions of the local revenue and expenditure data:

*Gross revenue* consists of revenue from taxation, incidental revenue, and receipts from operations.

*Revenue from taxation* refers to the total or sum of the following: internal revenue allotment, real property tax for the current and all preceding years, special assessment, residents tax, taxes on agricultural products, franchise tax,

efficiency are positively related with the development of the region. Thus, the differential changes in fiscal efficiency capture changes in the gross regional product. Fourthly, the expenditures of the regional governments do not include national government expenditures in those regions. The expenditure data would be closely correlated with tax data, because the major source of local government finance are local revenues. Since normally they cannot incur any deficits in their operations unless supported by national government funds, their operations are limited to their revenue incomes. Using our previous reasoning, local expenditure data are highly associated, too, with income changes. Finally, the data are not deflated by any price levels. There have been dramatic price changes from 1948 to 1966, but the method of presenting relative regional growth rates will be independent of price changes.

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special license tax, weight and measures, municipal licenses, taxes on income, inheritance and gifts, alien registration fees, sales of forfeited property, and other revenues.

*Expenditures* are actual expenditures of the local governments, not planned expenditures.

The data are derived from:

*Reports of the Auditor General to the President and the Congress of the Philippines on Local Governments and Provincial Hospitals*, 1955 (pp. 61-62); 1961 (pp. 67-69); 1966 (pp. 22-61).

In quantifying the dimensions of regional economic growth in the Philippines, two important things should be stressed: rates of change and levels of GRP. It shall be shown below that the qualifications just enumerated are not serious obstacles to the measurements of both items.

Rates of change of GRP. It is possible to have rates of change by region quantified by simply using the rates of change of the proxy data. But in the event that there is some bias of one kind or another in the data, the rates of change estimates will also be biased. With the introduction of the estimates of regional growth elasticities based on measurements from the surrogate data, this systematic bias is eliminated provided the bias in the total and the regional values of the surrogate are in the same direction. A regional growth elasticity will tell by how much GRP grows for every one per cent of GNP growth.

On the basis of *a priori* knowledge about the development of the Philippine economy and the nature of local finance data, it is to be expected that if there is any data bias from local finance information as a reflection of total economic activity, the bias of data on individual regions and on aggregates of regions are in the same direction. For instance, if total revenue collections as a per cent of gross national

product has been rising through time, it must be because regional collections as a per cent of gross regional product have been rising, too. The use of regional growth elasticities also enables us to handle regional rates of change bias; it also helps to do away with problems of price changes. The technical appendix explains how these problems can be dealt with by the use of regional growth elasticities.

How do we move from regional growth elasticities to regional rates of change? Since the rate of growth of gross national output is known, it is possible to translate information on growth elasticities by simply multiplying the known national growth rate by the regional growth elasticity. Or else, simple information of the growth elasticity is sufficient to indicate the pattern of rates of change. In the following, the regional growth elasticities are simply reported.

Levels of GRP. Levels of fiscal data help to indicate that part of income that is captured by the fiscal machinery. A local government which experiences in its locality more economic activity would be able to capture more internal tax revenues because more economic units will be making decisions that reveal themselves in income and expenditure flows. At one point or another, the expenditure or income flows will

pass through the tax instruments of the governments concerned. Therefore, it is not impractical to deduce certain conclusions about income levels and their changes with the use of local government revenue data. Because of the high correlation between revenues and expenditures, the same can be said about local expenditure data.

Yet, what happens if local finance data have to be supplemented with additional adjustments in order to help indicate the appropriate levels? Such adjustments can be made, without affecting the nature of estimates for GRP, as the technical appendix shows. In a later section, too, when it is necessary to estimate actual levels of regional output, the additional assumptions will be spelled out more clearly.

### III. REGIONAL AND NATIONAL ECONOMIC GROWTH: 1948-1966

The patterns of regional growth can be better examined by knowing something about the magnitudes of growth of the national economy. On the basis of statistics of national income, the Philippine gross national product experienced a real growth of 6 to 7 per cent per year in its early postwar period up to 1961 and about 5 per cent per year from 1962 to the present. The rate of growth of population is 3.2 per cent per year, as shown by the censuses of 1948 and 1960. The per



capita real growth rates of the gross national product are therefore from 2.8 to 3.8 per cent in the early period and about 1.8 per cent in the later one.

From the viewpoint of different regional economies, it is desired that relative growth rates be known with respect to the growth of the national economy, both in absolute and in per capita terms. The per capita growth figures are important because of the strong population movements observed for different regions of the Philippines, which will be analyzed below.

To answer these questions, we report regional gross product growth elasticities derived from local public finance data. The appendix to this paper explains the method of computing these GRP elasticities. As mentioned earlier, these growth elasticities per region show the growth of the region's GRP with respect to changes in GNP. An elasticity of unity implies that one per cent growth of the national economy is also followed by a one per cent growth of the regional economy. When the growth elasticity exceeds unity, the regional economy shows a higher per cent growth response to the growth of the economy. Thus, the value of the regional growth elasticity may be interpreted to imply the relative growth response of the region for every per cent increase of the nation's GNP.

The Bureau of the Census and Statistics (BCS) classification is adopted in the grouping of regional economies in this study. This classification divides the Philippines into ten regional groups based largely on economic, ethnic, and geographic considerations. The decision to use this classification is partly based on the greater comparability between this study with future research, since future studies on regional economies will probably be based on BCS regional classification. There is one slight modification in the classification here compared to that of BCS. The rich municipalities of Rizal Province, which are classified as part of Metropolitan Manila, could not be disaggregated from the earlier local fiscal data. Moreover, in view of the special situation of Rizal province relative to Metropolitan Manila, it was thought more desirable to treat it as a separate region. Therefore, it was removed from the Southern Luzon and Islands region of the BCS and treated separately. This scheme permits us to examine the relative development of Rizal as a region compared to all the other regions of the Philippines.

A. GRP Growth: By Regional Totals

Table 1 presents estimates of regional growth elasticities using as surrogates for output growth local gross revenue and expenditure data. These two sets of data provide

Table 1. GRP GROWTH COEFFICIENTS, 1948-1966

<u>Regions</u>	<u>1948-1961</u>		<u>1961-1966</u>		<u>1948-1966</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
I. Metropolitan Manila	1.00	1.20*	0.71*	1.01	0.90*	1.01
Rizal	2.23*	2.82	1.90	3.14*	3.02	3.90*
II. Ilocos & Mt. Province	0.92	1.41*	0.66*	0.76	0.80	0.97*
III. Cagayan Valley & Batanes	0.42*	0.64	0.91*	1.03	0.61*	0.84
IV. Central Luzon	0.82	0.88*	0.95*	0.97	0.89	
V. Southern Luzon & Islands	0.88	1.11*	0.77	0.91*	0.79	1.00*
VI. Bicol	0.58*	1.64	0.42	0.96*	0.74*	0.81
VII. Western Visayas	0.53*	0.58	1.00	1.06*	0.76*	0.79
VIII. Eastern Visayas	1.04	1.08*	0.62	0.73*	0.74	0.85*
IX. Southwestern Mindanao & Sulu	0.92*	1.00	1.31*	1.35	1.17*	1.27
X. Northeastern Mindanao	0.76*	0.92	1.22*	1.61	0.99*	1.40

\*Coefficients marked by asterisks are those derived from regional gross revenue data; those unmarked are computed from regional expenditure data.

A single coefficient means that estimates of the GRP growth coefficient is the same for both proxy measures.

independent estimates of rates of movements of local governmental fiscal operations. Although they are highly correlated, separately, each one would be an indicator of gross output movements. Local gross revenue data would capture that part of regional output which passes through the fiscal machinery. Local expenditure data would reveal the relative extent of local expenditure operations, presumably in response to local needs. The more well off the region, the higher the expenditure level. In addition, the faster is the rate of regional growth, the faster also is the rate of expenditure change.

The estimates of regional growth elasticities are presented in their two ranges, a high and a low estimate, based on the values derived from the two proxy measures of GRP. The reader may wish to take a simple average of these two values to get perhaps a more reliable measure of the relevant regional elasticity coefficients. The coefficients with asterisks are those based on local revenue data, the unmarked ones on expenditure data. The two estimates differ from each other in relatively random fashion, so that the difference in the elasticity measures are probably not due to any systematic bias on the part of the specific proxy for regional output. This evidence is important because it confirms the relative reliability of the measures of the GRP.

1948-1961.

We note that this period marked a relatively higher per annum growth rate for the Philippine economy than in the succeeding period. This therefore implies that even while some regional growth coefficients are lower than for the later ones, the specific regions under consideration may have grown relatively more in this period.

The growth of Metropolitan Manila and Rizal Province is very evident in the figures relative to the other regions. For every per cent growth of output, Rizal province showed the highest rate of growth, ranging from 2.2 to 2.8 per cent. Metropolitan Manila, on the other hand, expanded by 1.0 to 1.2 per cent for the same period. The only other region with a relatively high growth response is Eastern Visayas, which is dominated by the growth of Cebu -- the province and the city. It is not particularly as easy to conclude that the Bicol and Ilocos regions enjoyed higher growth elasticities, because of the diversity in the range of the estimates of these growth coefficients. Moreover, these two regions did not have any apparent high growth. The Bicol region's principal industries are mining and coconuts. The region of Southwestern Mindanao and Sulu, which includes Cotabato, Zamboanga, and Iligan City, appears to have grown in almost the same pace as the growth of the national economy.

The other regions showed lower growth response, meaning that their growth rates lagged behind the national growth rates. This pattern is quite obvious for Cagayan Valley and Western Visayas. The lags of Central Luzon, Southern Luzon, and Northeastern Mindanao, however, are not very large. But knowing that the income levels of these provinces are not high, as we shall shortly show, they were really experiencing widening inequalities -- at the lower end -- in the regional distribution of income.

1961-1966.

The years marking the second period reflect the influence of foreign exchange decontrol, the major economic policy change of the 1960's. The decontrol policy favored the traditional export sectors, which, of course, were more dependent on agriculture. We shall reserve analysis of the reasons for the shifts in regional growth in Part II of this paper. For our purposes here, we shall be content with describing the shifts in regional growth response patterns after decontrol.

Decontrol apparently did not shift the regional growth patterns to the disadvantage of Metropolitan Manila and Rizal. The growth coefficients of Rizal appear not to have altered much. It is possible that Rizal has grown more relative to

the economy as one of the estimates of the coefficient shows. Although the growth coefficient of Metropolitan Manila appears to have decreased, the evidence is not so conclusive, because the range of the growth coefficient estimates appears close to one. Thus, it may also be assumed that the region had not suffered in any relative sense in terms of growth response. The growth coefficients of the Mindanao regions are, by any measure, higher than unity. Their values have increased quite significantly compared to the earlier period. Some of these regions are just displaying the impact of economic growth based on the wood products industries. But the growth of agriculture in this region, sparked by the policy change of the 1960's and by the rapid flow of new people to Mindanao, accounts for the relatively high expansion rates during this period. To a less extent, the Cagayan Valley region shares the relative shift in growth rates that the virgin lands of Mindanao have experienced, although the growth elasticity coefficient is only near unity.

The dramatic growth shift of Western Visayas, the seat of the sugar industry is easily noticeable. The change in the coefficient from their early period values is quite substantial. This progress can be attributed to the favorable position enjoyed by sugar as a result, firstly, of Cuba's revolution and, secondly, of decontrol.

... traditional rice-producing region of the Philippines. There is an apparent increase in the value of the growth coefficients, but this increase is not substantial. This is an indication of growth shifts, however, we may conclude that decontrol had slightly favored the region of Central Luzon.

The regions whose relative growth coefficients showed decreases are Eastern Visayas, Southern Luzon, and Ilocos, although the Bicol region may also have suffered the same experience.

The relative growth patterns of all the regions from 1948 to 1966 are shown in the last column of Table 1. In Table 2, the differences in the growth elasticities for each specific measure are summarized. Note that the second period is compared to the first by deducting the second elasticities. Therefore, a negative change implies an increase in the 1961-1966 elasticities compared to the 1948-1961 estimates.

#### B. Per Capita GRP Growth, 1948-1966

The regional growth patterns discussed above concern total regional output expansion and its relationship to national output growth. In view of the regional differences in population growth, it is important to examine the movements of per



DIFFERENCE OF GROWTH COEFFICIENTS,  
1948-61 and 1961-66

<u>Regions</u>	<u>Difference in Growth Coefficients</u>	
	<u>Based on Expenditure Surrogate</u>	<u>Based on Revenue Surrogate</u>
I. Metropolitan Manila	-0.01	+0.49*
Rizal	+0.92	-0.91*
II. Ilocos & Mt. Province	+0.16	+0.75*
III. Cagayan Valley & Batanes	-0.39	-0.49*
IV. Central Luzon	-0.15	-0.07*
V. Southern Luzon & Islands	+0.11	+0.20*
VI. Bicol	+1.22	-0.38*
VII. Western Visayas	-0.42	-0.53*
VIII. Eastern Visayas	+0.42	+0.35*
IX. Southwestern Mindanao & Sulu	-0.39	-0.35*
X. Northeastern Mindanao	-0.69	-0.46*

Note: A negative difference means that the 1961-1966 coefficients are higher by the magnitude noted. Likewise, a positive difference means that the 1948-1961 coefficients are higher.

\* Derived by deducting the growth coefficient of 1961-66 from the 1948-61 coefficients, done for each specific surrogate.

capita output growth in relation to per capita national output. This will be done now.

Table 3 shows the different rates of growth of population and estimates of net migration by region. The regional population growth rates were derived from the two censuses of population, 1948 and 1960. We use, however, Pascual's estimates of net migration,<sup>3</sup> which were also based on census figures. As can be seen, the regions with low growth rates are also those experiencing *net* outward movements of population. The regions with very high in-migration figures are Rizal province and the two Mindanao regions, Cagayan Valley, and the Southern Luzon provinces. All the other regions appear to have experienced net outflow of residents, with perhaps the exception of Bicol, which apparently had a near zero outflow. When we compare the internal migration statistics with the total regional output growth elasticities, it is noted that those regions with high in-migration are also those with high growth elasticities. Thus, labor movements are in accord with wellknown studies -- labor moves into areas of high economic opportunity.

In making the computations of per capita figures, the intercensal annual population growth rates were used.

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<sup>3</sup>Elvira M. Pascual, "Internal Migration in the Philippines," *First Conference on Population, 1965* (University of the Philippines Press, Quezon City, 1966), pp. 333-4.

Table 3. POPULATION GROWTH AND NET POPULATION MOVEMENT BY REGION

	Average Per Year Population Growth 1948-60	Net Estimated Migration	1948 Population (in thousands)	Migration Rate Per 1,000 Population in 1948
I. Metropolitan Manila	0.03	-64,600	1,181	-55
Rizal	0.10	389,000	673	578
II. Ilocos & Mt. Province	0.02	-38,400	1,130	-34
III. Cagayan Valley & Batanes	0.05	38,600	669	58
IV. Central Luzon	0.03	-144,800	2,731	-53
V. Southern Luzon & Islands	0.04	13,200	1,871	7
VI. Bicol	0.04	-54,400	1,666	-33
VII. Western Visayas	0.02	-239,600	3,079	-78
VIII. Eastern Visayas	0.01	-345,400	3,441	-100
IX. Southwestern Mindanao & Sulu	0.09	396,000	1,567	253
X. Northeastern Mindanao	0.04	163,200	1,376	119

Source: Bureau of the Census and Statistics: 1948 Population Census, 1960 Population Census. The net estimates migration figures are those of Pascual (see footnote 3), the net migration rate per 1,000 population ours.

Table 4. PER CAPITA REGIONAL GROWTH COEFFICIENTS, 1948-66

<u>Regions</u>	<u>1948-1961</u>		<u>1961-1966</u>		<u>1948-1966</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
I. Metropolitan Manila	1.92*	3.00	0.77*	1.16	0.98*	1.20
Rizal	0.33*	1.00	1.24	2.50*	1.23	1.96*
II. Ilocos & Mt. Province	3.75*	10.00	0.75*	0.88	1.10	1.42*
III. Cagayan Valley and Batanes	(18.00)	(1.75)*	0.81*	0.96	0.17*	0.45
IV. Central Luzon	1.00	1.08*		1.10	1.10	1.11*
V. Southern Luzon and Islands	1.08*	6.00	0.90	1.08*	0.70	1.08*
VI. Bicol	(0.50)*	24.00	0.29	1.06*	0.65*	0.75
VII. Western Visayas	0.58*	2.00	1.28	1.38*	1.20*	1.30
VIII. Eastern Visayas	3.92*	30.00	1.02*	0.83	1.55	1.75*
IX. Southwestern Mindanao & Sulu	(34.00)	(2.42)*	0.73*	0.79	(0.07)	(0.03)*
X. Northeastern Mindanao	(9.00)	(0.50)*	1.25*	1.74	0.77*	1.38

\*Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.

A single coefficient means that estimates of the GRP growth coefficient is the same for both proxy measures.

Population levels were extrapolations of regional population to 1961 and 1966. Thus, it was possible to project population levels per province on the basis of observations for the census years 1948 and 1960.

1948-1961.

Table 4 shows per capita regional growth elasticities. The regions with the highest growth response coefficients are the Ilocos and Eastern Visayas. Coupled with the relative high absolute growth elasticities, the net outflow of the population has led to a higher share of GRP growth for the remaining population. However, regions with high rates of in-migration have also shown very low growth response coefficients. In fact, these are negative for the Mindanao regions and for Cagayan Valley.

It appears that Central and Southern Luzon regional per capita output growth rates moved in the same direction as national per capita output growth. The Visayas have experienced apparently higher per capita GRP growth compared to the nation's growth. We may find the per capita regional growth elasticities based on revenue figures more acceptable to those based on the expenditure data, especially those in the period 1948-61.

The above data do not yield immediate conclusions about the economic factors affecting migration. The regions with high in-migration rates are the ones with negative GRP growth elasticities and those with out-migration rates, with relatively high per capita growth elasticities. On closer examination, however, those regions with high in-migration rates have on the whole larger GRP growth elasticities in the sense of total regional economic performance. Thus, the incentive for migration is based on the total growth of the regional economy.

We should mention that Metropolitan Manila has a relatively high per capita output growth coefficient. Using only the estimate based on per capita revenue growth proxy, per capita output in Manila rose by 1.9 per cent for every per cent increase of national output. Rizal province, however, which is the object of the highest in-migration rate experienced by any region in the Philippines shows a slower per capita growth than the national average if we take the lower estimate.

1961-1966.

The per capita growth elasticities also changed during the second period under study. The most noticeable change is that the per capita growth coefficients are now

all positive. Thus, there is substantial increase in the per capita growth coefficients especially of the regions which had negative output growth elasticities in the previous period.

Regions with improved per capita growth elasticities are Rizal province, Cagayan Valley, Central Luzon, Western Visayas, the two Mindanao regions, and Bicol. The higher growth elasticity for Western Visayas should be noted all the more because this region has the greatest hectarage of land devoted to sugar.

Metropolitan Manila has apparently shown a relatively slower growth after decontrol, as the fall in its growth elasticity shows, but when this is balanced by the growth of Rizal province, which is really part of the greater Manila region,<sup>4</sup> this observed fall of relative growth in Manila is only apparent. In fact, the only reason why Rizal has a relatively low growth elasticity is that the performance of the rich municipalities near Manila is pulled down by all the other poorer sections of Rizal province.

The last column of Table 4 summarizes the estimates of growth elasticities of each region for the years 1948-1966 and provides a summary pattern for the per capita growth

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<sup>4</sup>Recall that Makati, Mandaluyong, and other rich municipalities are grouped under Rizal, not Metropolitan Manila, because of the difficulty of disaggregating these from the provincial data.

elasticities throughout the period under study. In Table 5, the differences in the estimates of the per capita regional growth elasticities for the periods 1948-1961 and 1961-1966 are shown, thus summarizing the patterns observed in the previous table.

C. Regional Growth, 1948-66: Luzon, Visayas, Mindanao

For convenience, all the regions of the Philippines were subdivided into their usual groupings, by island groups: Luzon, Visayas, and Mindanao. The only difference of this from the BCS classification is that Palawan (which falls under the Census region Southern Luzon and Islands) is grouped with Mindanao, because it has the same characteristics as that island -- relatively large and untapped. We note also that the regional coverage of the Mindanao Development Authority includes Palawan.

Table 6 summarizes all the information. Part A shows estimates of GRP growth elasticities; Part B shows the corresponding per capita growth coefficients.

On the whole, the period 1948-61 characterizes higher relative growth of Luzon compared to other regions of the Philippines. In the second period, Mindanao assumes the lead. Taking measurements from the growth coefficients based on revenues, for every one per cent growth of the nation's output,



Table 5. DIFFERENCE OF GROWTH COEFFICIENTS,  
1948-61 and 1961-66

<u>Regions</u>	<u>Difference in Growth Coefficients</u>	
	<u>Based on Expenditure Surrogate</u>	<u>Based on Revenue Surrogate</u>
I. Metropolitan Manila	+ 1.84	+1.15*
Rizal	- 0.24	-2.17*
II. Ilocos & Mt. Province	+ 9.22	+3.00*
III. Cagayan Valley & Batanes	-18.96	-2.56*
IV. Central Luzon	- 0.02	-0.10*
V. Southern Luzon & Islands	+ 5.10	0*
VI. Bicol	+23.71	-1.56*
VII. Western Visayas	+ 0.72	-0.80*
VIII. Eastern Visayas	+29.17	+2.90*
IX. Southwestern Mindanao & Sulu	-34.79	-3.15*
X. Northeastern Mindanao	-10.74	-1.75*

Note: A negative difference means that the 1961-1966 coefficients are higher by the magnitude noted. Likewise, a positive difference means that the 1948-61 coefficients are higher.

\*Derived by deducting the growth coefficient of 1961-66 from the 1948-61 coefficients, done for each specific surrogate.

Table 6. GRP GROWTH COEFFICIENTS, 1948-66:  
LUZON, VISAYAS, MINDANAO

Part A. GRP Growth Coefficients

<u>Regions</u>	<u>1948-1961</u>		<u>1961-1966</u>		<u>1948-1966</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Luzon (includes Manila and Rizal)	1.08	1.12*	0.96	0.98*	1.02	1.05*
Visayas	0.79*	0.80	0.81	0.88*	0.76	0.80*
Mindanao and Palawan	0.23*	0.96	1.29*	1.46	0.68*	1.32

Part B. Per Capita GRP Growth Coefficients

<u>Regions</u>	<u>1948-1961</u>		<u>1961-1966</u>		<u>1948-1966</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
Luzon	0.08*	0.20		0.10		0.10
Visayas	0.25*	2.00	0.09	0.12*	0.13	0.14*
Mindanao and Palawan	(2.00)	(0.33)*		0.10	(0.01)*	0.03

\* Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.

Luzon experienced a growth of 1.12 per cent compared to 0.79 per cent for Visayas and only 0.23 for Mindanao in 1948-61. But in the second period, while Luzon grew in the same relative proportion as GNP growth, Mindanao expanded by about 1.29 per cent for every one per cent of GNP expansion.

In per capita terms, however, the Visayas appeared to have somewhat higher growth response for every per cent increase in GNP. Mindanao, due to high in-migration and relatively low growth elasticities in 1948-61, showed negative per capita output for every increase in per capita total output. But by 1961-1966, this picture is reversed.

#### D. Regional Growth: Selected Provinces and Chartered Cities

It is useful to examine the growth performance of some provinces and cities. This provides a comparison with the different regional estimates of growth coefficients in the previous sections and enables us to form more direct conclusions about the relative growth of other provinces or cities within each specific BCS region.

Provinces. Table 7 shows the estimates of the regional GRP coefficients with respect to changes in total output and in Table 8 regional per capita GRP growth coefficients. It should be noted that data for cities located

Table 7. OUTPUT GROWTH COEFFICIENTS, 17  
SELECTED PROVINCES, 1948-1966

<u>Provinces</u> **	<u>1948-61</u>		<u>1961-66</u>		<u>1948-66</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
<u>Central Luzon</u>						
Bataan	0.58	1.32*	2.00	2.35*	1.42	2.22*
Bulacan	0.59*	0.70	1.09	1.36*	0.91	1.27*
Pampanga	0.70*	1.18	1.19*	1.27	0.92*	1.32
<u>Southern Luzon</u>						
Batangas	1.16	1.38*	0.92	1.07*	1.03	1.28*
Cavite	1.00	1.70*	0.41*	0.42	0.58	0.89*
Laguna	0.90	1.09*	0.59	0.76*	0.66	0.83*
Palawan	0.45*	0.68	1.56	1.66*	1.03*	1.21
<u>Western Visayas</u>						
Panay	0.64*	0.90	0.42	0.57*	0.53*	0.54
Negros Occidental	0.06	0.39*	1.42*	1.57	0.81	0.87*
Negros Oriental	0.56	0.57*	1.04	1.07*	0.79*	0.81
<u>Eastern Visayas</u>						
Bohol	0.53*	0.70	0.20	0.41*	0.33	0.39*
Cebu	1.36	1.41*		0.77	1.00	1.06*
Leyte	0.70	0.91*	0.40	0.65*	0.45	0.72*
Samar	0.88*	1.02	0.39	0.46*	0.56	0.58*
<u>Southwestern Mindanao</u>						
Cotabato	1.11*	2.36	1.62	2.06*	1.82*	2.37
Davao	0.78	0.89*	1.22	1.30*	1.05	1.14*
<u>Northeastern Mindanao</u>						
Misamis Oriental	0.21*	0.44	0.24	0.99*	0.26	0.53*

\*Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.

\*\*Including chartered cities in their provincial boundaries.

Table 8. PER CAPITA OUTPUT GROWTH COEFFICIENTS, 1948-1966

<u>Provinces</u> **	<u>1948-61</u>		<u>1961-66</u>		<u>1948-66</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
<u>Central Luzon</u>						
Bataan	(22.00)	1.17*	2.14	2.63*	1.27	2.38*
Bulacan	( 3.00)	1.75*	1.28	1.67*	1.15	1.79*
Pampanga	( 0.50)*	3.00	1.27*	1.36	0.79*	1.43
<u>Southern Luzon</u>						
Batangas	3.25*	14.00	1.03	1.27*	1.40	1.83*
Cavite	0.10	3.42*	0.19*	0.24	0.25	0.79*
Laguna	(5.00)	0.67*	0.07	0.69*	0.35	0.66*
Palawan	(16.00)	(1.50)*	1.69	1.83*	0.84*	1.10
<u>Western Visayas</u>						
Panay	1.67*	22.00	0.55	0.79*	0.98*	1.02
Negros Occidental	(21.00)	(0.25)*	1.90*	2.07	1.23	1.31*
Negros Oriental	( 8.00)	(0.08)*	1.22	1.27*	0.92*	0.95
<u>Eastern Visayas</u>						
Bohol	2.08*	25.00	0.29	0.60*	0.77	0.90*
Cebu	5.00*	39.00	0.96		1.93	1.97*
Leyte	3.00*	14.00	0.52	0.92*	0.82	1.44*
Samar	3.08*	30.00	0.48	0.62*	1.12	1.13*
<u>Southwestern Mindanao</u>						
Cotabato	(16.00)	(2.75)*	0.84	1.21*	0.42	0.14*
Davao	(49.00)	(3.50)*	0.36	0.38*	(0.63)	(0.42)*
<u>Northeastern Mindanao</u>						
Misamis Oriental	0.67*	16.00	0.34	1.56*	0.65	1.35*

\*Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.

\*\*Including chartered cities in their provincial boundaries.

within or adjacent to provincial boundaries are aggregated with those provinces, e.g., Cebu City with Cebu province. The analysis of the estimates shown cannot be divorced from what has been said about the other regions, so we subsume each province under the respective BCS regional classification. It appears that Cotabato in Mindanao had relatively higher growth compared to the national economy for the period studied. At the other end, consistently slow-growing regions are: Leyte, Samar, Misamis Oriental and Panay. The estimates of output growth elasticities for the Central and Southern Luzon provinces show quite a contrast in terms of their relative growth, depending on the period studied. Bulacan, Pampanga and Bataan had relatively higher growth coefficients after 1961, while the Southern Luzon provinces appeared to have fared better on a relative basis before 1961. In the Visayas, Negros island had higher growth after 1961; by contrast, Cebu island had a relatively higher GRP growth coefficient before 1961. Davao and Palawan had higher relative growth coefficients after 1961.

On a per capita basis, the following had growth relatively faster than the national average: Batangas, Bulacan, Cebu, Leyte, Samar, and Negros Occidental. Prior to 1961, it should be noted that some provinces, due to high population growth rates had negative growth coefficients. These are notably Pampanga,

Negros, Palawan, Cotabato and Davao, with the last two provinces having the greatest fall in per capita growth. We note, of course, that these two provinces had very high population growth rates, due largely to internal in-migration.

Cities. We add the estimates of growth elasticities for a number of chartered cities relative to national economic growth. In general, many cities had relatively higher growth elasticities than the corresponding provinces to which they belong. There were, however, cities with relatively poor growth coefficients, especially after 1961. Among these were Baguio, Basilan, Naga, Roxas, and Tagaytay.

We should note the total output growth elasticity estimates for three cities in Metropolitan Manila: Pasay, Quezon, and Manila. Manila's growth was less than the national average when viewed in terms of the growth elasticity estimates. But Quezon City grew quite fast. Pasay had high growth before 1961, but a relatively poor one after that year. However, on a per capita elasticity basis, Quezon had a negative growth elasticity.

All the estimates of growth elasticities for selected cities are given in Tables 9 (GRP growth coefficients) and 10 (per capita GRP growth coefficients.).

Table 9. OUTPUT GROWTH COEFFICIENTS OF  
SELECTED CITIES, 1948-1966

<u>Chartered Cities</u>	<u>1948-61</u>		<u>1961-66</u>		<u>1948-66</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
<u>Metropolitan Manila</u>						
Manila	0.70	0.97*	0.56*	0.90	0.68*	0.79
Quezon	1.84	2.79*	1.23*	1.88	2.27	2.32*
Pasay	2.20*	4.68	(0.09)	0.34*	1.03*	1.11
<u>Ilocos &amp; Mt. Province</u>						
Baguio	0.92	2.52*	0.22	0.23*	0.40	1.06*
<u>Southern Luzon</u>						
Tagaytay	(0.20)	0.79*	0.66*	0.72	0.27	0.66*
Cavite	0.78	0.97*	0.36*	0.42	0.49	0.55*
<u>Bicol</u>						
Legaspi			0.48	1.93*		
Naga	1.14*	1.18	0.21*	0.28	0.51*	0.54
<u>Western Visayas</u>						
Dumaguete	0.50	1.09*	1.09*	1.14	0.84	1.12*
Iloilo	1.48*	1.54	0.21*	0.41	0.64*	0.76
Roxas	0.95*	1.50	0.34	0.52*	0.65*	0.70
<u>Eastern Visayas</u>						
Bacolod	0.38	1.06*	1.50*	1.82	1.15	1.38*
Cebu	2.10	2.54*	1.14*	1.20	1.78	2.06*
Tacloban	1.52	1.80*	0.80	0.94*	1.10	1.42*
<u>Southwestern Mindanao</u>						
Basilan	0.59*	0.98	0.39*	0.57	0.42*	0.68
Cotabato			1.05	1.42*		
Davao	0.82	1.24*	0.88*	1.94	0.96	1.05*
Zamboanga	0.71*	0.88	0.72*	0.97	0.66*	0.92
<u>Northeastern Mindanao</u>						
Butuan	1.68	1.70*	0.65*	1.63	1.11*	1.94
Iligan	1.22	1.73*	1.21*	1.55	1.56	1.61*
Marawi	0.52*	1.34	0.55*	0.82	0.46*	1.03
Ozamis	1.05*	3.14	0.12	0.60*	0.75*	0.98

\*Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.



Table 10. PER CAPITA OUTPUT GROWTH COEFFICIENTS, 1948-1966

<u>Chartered Cities</u>	<u>1948-61</u>		<u>1961-66</u>		<u>1948-66</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
<u>Metropolitan Manila</u>						
Manila	3.33*	16.00	0.79*	1.29	1.37*	1.70
Quezon	(57.00)	(3.08)*	(0.46)*	0.03	(0.95)	(0.73)*
Pasay	4.83*	116.00	(0.41)	0.12*	0.94*	1.07
<u>Ilocos-Mt. Province</u>						
Baguio	(20.00)	3.83*	(0.21)*	(0.19)	(0.48)	0.41*
<u>Southern Luzon</u>						
Tagaytay	(36.00)	0.67*	0.71*	0.79	(0.10)	0.69*
Cavite	(16.00)	(0.08)*	0.04*	0.16	(0.13)	0.01*
<u>Bicol</u>						
Naga	6.25*	59.00	0.35*	0.45	1.51*	1.68
<u>Western Visayas</u>						
Dumaguete	(16.00)	1.33*	1.13*	1.21	0.72	1.21*
Iloilo	3.33*	25.00	0.04*	0.33	0.59*	0.80
Roxas	0.17*	10.00	0.16	0.36*	0.31*	0.32
<u>Eastern Visayas</u>						
Bacolod	(0.30)	3.58*	2.25*	2.62	2.52	2.94*
Cebu	6.08*	32.00	1.19*	1.28	2.17	2.54*
Tacloban	6.83*	47.00	1.12	1.38*	2.37	3.00*
<u>Southwestern Mindanao</u>						
Basilan	(0.33)*	2.00	0.31*	0.55	0.15*	0.57
Davao	(36.00)	(1.42)*	0.38*	0.60	(0.22)	(0.01)*
Zamboanga	1.08*	11.00	0.90*	1.24	0.92*	1.50
<u>Northeastern Mindanao</u>						
Butuan	(37.00)	(2.25)*	(0.29)*	0.62	(0.54)*	(0.23)
Iligan	(34.00)	(1.08)*	0.48*	0.86	(0.03)	0.13*
Marawi	(0.33)*	19.00	0.56*	0.93	0.32*	1.38
Ozamis	2.58*	99.00	(0.003)	0.71*	1.13*	1.65

\*Coefficients marked by asterisks indicate those derived from regional revenue data; those unmarked are computed from regional expenditure data.

#### IV. DIMENSIONS OF REGIONAL GROSS PRODUCT LEVELS

While it is essential to present regional output growth elasticities in order to show the relative regional response to every per cent of national economic growth, it is also significant to know actual regional income levels. This is attempted in this section.

The underlying assumptions of the estimates of regional output levels should be clear to the reader. There are two important factors for which assumptions had to be made. The first concerns fiscal efficiency. Since for every peso of new output generated, a more efficient administrative system can capture more revenues, the revenue surrogates used will yield upward biased estimates of output levels. It was assumed that the fiscal system of Metropolitan Manila was relatively more efficient by 25 per cent. All the other regions were assumed to have roughly the same fiscal efficiency, except for the two Mindanao regions. The last mentioned were assumed to be less efficient in capturing output streams through the fiscal system. The reason for this assumption is that the Mindanao area is a relatively frontier area where a substantial amount of immigration of adults from different regions of the Philippines has occurred. Earlier estimates of "apparent" per capita regional product figures showed that they were not very realistic, considering that the migrant population, which is

heavily weighted by members of the labor force, were moving into areas where employment in productive activities are easy to find. Thus, there was some reason to believe that the fiscal data understated the real volume of economic activities within the Mindanao economy. The inefficiency adjustment index for Mindanao is assumed at 10 per cent; the result of a pure, but perhaps, educated conjecture.

The other assumption concerns self-consumed output at the farm. Such activities are substantial in all underdeveloped economies. In the absence of any studies dealing on this point, a guess is offered that the output captured by fiscal data, after all adjustments concerning fiscal efficiency are made, is understated by about 1/4 of the estimated output. This is probably a very reasonable guess, considering that, in the case of palay, some findings have been made that non-marketed output varies from 40 to 60 per cent of total output, or roughly at 50 per cent.<sup>5</sup>

A decision was made to utilize only the total revenue data as proxy. Based on the estimates of growth elasticities, those based on the revenue surrogate are relatively

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<sup>5</sup>Mangahas, M., *The Response of Philippine Farmers to Price*, master's thesis, University of the Philippines, Department of Economics, 1965, p. 178-82.

better. The ratio of total local government revenue data to total Bureau of Internal Revenue (BIR) collections were studied, and it was found out that their ratios were relatively stable for the years studied, except for 1948 when it appeared that local government collections had a higher ratio to BIR collections. The reason behind this is not quite clear since one would expect that the trend would obviously have been in the opposite direction, with local governments having a larger ratio through time. It was therefore decided that in translating our surrogate data into their implied output levels, the local revenue-BIR collections ratio has remained unchanged through time. However, estimates of BIR collections as a ratio of gross national product showed relative stability through time.

It may be noted that the above adjustments have no effects on the values of the regional growth coefficients, as shown in the technical appendix.

Distribution of Gross Regional Product. The distribution of total regional gross product is given in Table 11 for the years under study. The data presented there perhaps provide the first attempt to reveal the relative distribution of GRP.

Table 11 shows the relative distribution of regional gross product by island groups and by BCS census regions. The

Table 11. DISTRIBUTION OF REGIONAL GROSS PRODUCT, 1948, 1961, 1966

	1	9	4	8	1	9	6	1	1	9	6	1	1	9	6	6
	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP	Regional GRP as Per Cent of total GNP
I. Metropolitan Manila	20			34		22		37		18						30
Rizal	3			5		5		8		10						17
II. Ilocos & Mt. Province	5			9		5		8		4						7
III. Cagayan Valley and Batanes	3			5		2		3		2						3
IV. Central Luzon	12			21		12		20		12						20
V. Southern Luzon and Islands	9			16		9		15		8						15
VI. Bicol	6			10		5		8		5						8
LUZON	58			100		60		100		59						100
VII. Western Visayas	14			54		12		50		12						52
VIII. Eastern Visayas	12			46		12		50		11						48
VI S A Y A S	26			100		24		100		23						100
IX. Southwestern Mindanao & Sulu	10			62		10		62		12						67
X. Northeastern Mindanao	6			38		6		38		6						33
MINDANAO	16			100		16		100		18						100

noticeable pattern is that Luzon's GRP accounted for 58 per cent of total GNP in 1948. This share was 59 per cent by 1966. In addition, the ~~share~~ of Mindanao's gross regional product increased by more than 2 per cent from 1948 to 1966. These differential gains in regional economic development were made at the expense of the Visayas. From 1948 to 1966, there was a fall by 3 per cent points of the contribution of the Visayas to total GNP.

Going now to the more detailed breakdown of regions, it is interesting to note that while Metropolitan Manila and Rizal contributed about 23 per cent of total GNP in 1948, by 1966 this was 28 per cent. This represents an increase by 5 per cent points in the relative importance of the Greater Manila region. In 1948, these two regions accounted for about 39 per cent of the total GRP of Luzon. By 1961, this was 45 per cent and by 1966, 47 per cent. As the estimates show, the dramatic gains of the two regions are due to the high growth of Rizal province. Alone, Rizal province accounted for a sharp increase of its share of total GNP by 7 percentage points. When translated in terms of contribution to total GNP, these measures indicate that Greater Manila, including all of Rizal province, contributes close to 1/4 of the total GNP.

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We note also that Central Luzon contributed about 1/5 of Luzon's GRP. Southern Luzon (except Rizal Province) and Central Luzon accounted for 37 per cent of Luzon's GRP in 1948 and 35 per cent in 1961 and 1966. The Bicol, Ilocos and Cagayan regions appeared to have lost their relative economic importance when viewed in terms of their share to Luzon's GRP or to the GNP.

Of the two Visayan regions, Western Visayas had a sharper relative decline in terms of GRP. From 14 per cent of total GNP in 1948, Western Visayas GRP dropped to 12 per cent by 1966. Mindanao's relative gains are shown largely by Southwestern Mindanao and Sulu. In 1948, this region accounted for 62 per cent of Mindanao's GRP; in 1966, this was 67 per cent. Southwestern Mindanao's gain in terms of total GNP was by 2 per cent points between 1948 and 1966.

Regional income differentials. It will be interesting to know what figures our proxy estimates of regional product yield when translated in terms of their implied regional gross product levels. We attempted to present the implied GRP's per capita for the year 1966. These estimates are in current prices. No attempts are made to translate these in constant prices, although this is easy to do.

Table 12 presents in the first column the per capita GRP for all the different BCS regional groupings. It is easy

Table 12. REGIONAL GROSS PRODUCT LEVELS, 1948-66

	Implied Per Capita Regional Gross Product (in current prices)	Index of GRP/Person		
	<u>1966</u>	<u>1948</u>	<u>1961</u>	<u>1966</u>
I. Metropolitan Manila	2,371	323.8	358.2	336.3
Rizal	931	94.4	88.4	132.1
II. Ilocos & Mt. Province	654	78.9	103.1	92.8
III. Cagayan Valley & Batanes	398	85.7	61.1	56.4
IV. Central Luzon	655	88.9	90.8	92.9
V. Southern Luzon & Islands	657	89.8	91.9	93.2
VI. Bicol	413	68.4	58.4	58.6
VII. Western Visayas	672	88.1	85.1	95.3
VIII. Eastern Visayas	615	66.5	88.0	87.2
IX. Southwestern Mindanao & Sulu	477	130.3	83.2	74.5
X. Northeastern Mindanao	491	84.7	71.6	76.6
Philippines	705	100.0	100.0	100.0



to see that Manila's GRP per capita is the highest for the nation, almost three and a half times the nation's GNP per capita average. Of course, the reason for the relatively higher GNP per head on an average level is Manila itself. The contrast shows more clearly when Metropolitan Manila's per capita GRP is compared with the other regions. We repeat that these GRP levels were computed on the basis of the assumptions about relative fiscal efficiency and imputed non-marketed output per region.

The per capita GRP of Rizal province is twice that of Bicol or of any Mindanao region. It is 1.4 times that of Western Visayas, the region with third highest per capita GRP. The Ilocos, Central and Southern Luzon have roughly the same per capita GRP levels. Eastern Visayas has a GRP level which follows closely. The Mindanao regions appear to be relatively more prosperous than the Bicol provinces. The GRP of Metropolitan Manila is six times and the GRP of Rizal is 2.3 times that of Cagayan Valley, the region with the lowest per capita GRP. The GRP of Metropolitan Manila is 2 and a half times that of Rizal Province.

The above indicates that in 1966 the regions of the Philippines had marked inequalities in the different levels of regional gross product on a per head basis. The growth

patterns described in the earlier sections help to account for the resulting regional distribution of the GNP in 1966.

Indexes of the per capita GRP of individual regions in 1948, 1961 and 1966 are presented in the later columns of Table 12. We note that they are indexes with the average GNP per person as the base. They can be reconstructed with the known GNP per person during the specific years indicated, by using these indexes which are reported in Table 12.

Comparison of results with other data. While we point out that the above undertaking is probably the first of its kind in attempting to measure relative regional economic performance in the Philippines, there are at least some previous measures of regional incomes made by the Bureau of the Census and Statistics. The Bureau of Census and Statistics Statistical Survey of Households (BCSSH)<sup>6</sup> has conducted two previous surveys of family income and expenditure on a nationwide basis during 1956-57 and 1961. The BCSH data are not exactly comparable to the ones estimated here since the former were based on family or household income. What was done in this paper was to utilize fiscal data to make implied measures of levels of gross output per region. These gross product

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<sup>6</sup>These surveys were known before as PSSH (Philippine Statistical Survey of Households).

Table 13. BCSSH FAMILY INCOME LEVELS

	1957 BCSSH Income	1961 BCSSH Income	Ratio of GRP '61 index to BCSSH '57 Income Index	Ratio of GRP '61 index to BCSSH '61 Income Index
I. Metropolitan Manila	289.2	265.5	1.24	1.35
II. Ilocos & Mt. Province	87.8	68.8	1.17	1.50
III. Cagayan Valley & Batanes	86.5	65.9	.71	.93
IV. Central Luzon	102.6	95.0	.88	.96
V. Southern Luzon & Islands	102.2	115.9	.90	.79
VI. Bicol	73.7	83.2	.79	.70
VII. Western Visayas	88.6	89.5	.96	.95
VIII. Eastern Visayas	63.1	64.6	1.39	1.36
IX. Southwestern Mindanao & Sulu	80.1	86.5	1.04	.96
X. Northeastern Mindanao	77.9	81.1	.92	.88
Philippines	100.0	100.0	1.00	1.00

Sources: Table 12 and The Philippine Statistical Survey of Households Bulletin, April 1961,  
Table B, p. XII.

measures were converted on a per capita basis. Family or household income is of course entirely different from output per person. An attempt was made to convert BCSSH family income into incomes per person, but the fact that the survey data used open-ended classifications for families with 10 or more persons made it difficult.<sup>7</sup>

In any event, we translated the BCSSH average regional family income in terms of an index with the BCSSH average Philippine family income as the base observation. These are reported in Table 13. The patterns of regional income levels follow more closely the ones estimated using proxy figures, except that Metropolitan Manila appears to be less sharply contrasted with the other regions. There are variations in each individual levels, as the ratios of our measures to the BCS family income index show. We note that with the exception of Eastern Visayas, Manila, and the Ilocos where our measures appear relatively more optimistic, the relative output by region are understated with the use of our measures.

It should be noted that in terms of the relative magnitudes conveyed by these different estimates of regional income levels, the two measures are not drastically far off from each

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<sup>7</sup>Preliminary attempts tried to yield the unacceptable results that Metropolitan Manila households were larger in terms of persons per household than rural households.

other. But we recall that the variations may be due in part to variations in number of persons per household per region. Converting family incomes into indexes and comparing with the national average cannot be fully translated into comparisons involving per capita incomes unless all families in the Philippines have equal number of persons for every household unit. I am, therefore, inclined to utilize the relative picture of per capita gross product magnitudes by region as drawn from the proxy estimates presented in this paper because they are based on known data. While we admit that we had to adjust figures by virtue of several assumptions, survey techniques are themselves subject to imputation techniques such as the adjustments we have made.

A second comparison is with respect to crop agricultural output. On the basis of the 1948 and 1960 censuses of agriculture, I grouped crop output statistics by provinces into the BCS regions used in this study. The major crops used were: palay (paddy rice), corn, sugar cane, tobacco, abaca, maguey, and coconut. The recorded output were valued in terms of the average prices per crop as implied from the 1960 census of agriculture. Total output for all crops were then added by region and their relative distribution to total output computed. These are shown in Table 14. To provide a basis for comparison,

Table 14. PER CENT DISTRIBUTION OF OUTPUT BASED ON SEVEN MAJOR CROPS\* BY REGIONS

	1	9	4	8	1	9	6	0	1	9	6	1
	Regional Agricul- tural Output as Per Cent of Total Seven Crops				GRP as Per Cent of Total GNP (excluding Manila)				Regional Agricul- tural Output as Per Cent of Total Seven Crops			
Ilocos & Mt. Province	3.2				6.2				5.2			6.4
Cagayan Valley	5.1				3.8				6.2			2.6
Central Luzon	17.0				15.0				15.5			15.4
Southern Luzon (with Rizal)	11.9				15.0				11.7			17.9
Bicol	11.6				7.5				10.1			6.4
Western Visayas	15.2				17.5				16.3			15.4
Eastern Visayas	14.0				15.0				10.6			15.4
Southwestern Mindanao	12.7				12.5				15.2			12.8
Northeastern Mindanao	9.2				7.5				9.2			7.7
Total	100.0								100.0			

\*Palay, corn, sugar cane, tobacco, abaca, maguey, and coconut.

we took out the GRP of Metropolitan Manila and included Rizal province into the Southern Luzon region. Then the share of the region's GRP to total GNP (excluding Manila's GRP) were recomputed. Although the GRP computations are indicators of a wider class of output of the economy, it is interesting to note how close the distribution of agricultural output based on six major Philippine crops to the ones based on proxy estimates of gross regional product.

A final supporting evidence of the closeness of the implied GRP estimates to actual is based on the regional economic accounts of Mindanao.<sup>8</sup> The estimates of per capita GRP for Mindanao in current prices are only about 5 per cent short of the estimates the Mindanao Development Authority have made of regional product in Mindanao per capita.

All the evidence presented above are reassuring that the attempts made in this paper are worthwhile and that with some degree of confidence the picture presented about regional economic growth is descriptive of what apparently happened to each regional economies.

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<sup>8</sup>These data became available to me after this study had been essentially finished. I am indebted to Mr. Enrique Nava, Chief of the Plans and Program Office of the Mindanao Development Authority. Incidentally, these economic accounts are aggregated for Mindanao and not broken down by regions.

### Summary and Conclusions

The dimensions of regional economic growth in the Philippines from 1948 to 1966 are studied. In the absence of actual regional economic accounts, a technique employing proxy measures is utilized. This method is the second best available since the work of gathering regional economic accounts is a very large undertaking, requiring time and effort not available to this researcher. For this measure, movements of local public finance data are used as surrogates for output movements. These enable us to compute relative regional growth elasticities with respect to the growth of the national economy. Coupled with additional assumptions about output which is consumed at the farm and about the extent to which the proxy statistics over or understate their indication of output levels, it is possible to arrive at estimates of comparative levels of gross regional product or GRP. After comparing these estimates with some other indicators of regional output, it is concluded that the implied levels of gross product from the proxy measures are within reasonable limits of acceptability.

The Philippine gross national product grew from 6 to 7 per cent per year between 1948 and 1961 and about 5 per cent per year between 1961 and 1966. The rate of growth of population has been estimated at about 3.2 per cent per year.



On the basis of regional economic performance, the period of 1948 to 1961 marked a relatively higher growth of Metropolitan Manila and Rizal province. For every per cent growth of gross national product, Rizal's growth ranged from 2.2 to 2.8 per cent. Metropolitan Manila grew by at least as much as the national growth rate. Considering that the size of the Greater Manila economy, both in per capita and total size, is quite high, a moderate growth of the regional economy had significant contributions to total GNP. The Ilocos, Southern Luzon, and Eastern Visayas regions apparently showed high relative growth.

In 1961 to 1966, the patterns of growth shifted to other regions -- Mindanao, Cagayan and the Western Visayas. However, the growth of Manila and Rizal appeared to have continued.

In general, the regions which have experienced high in-migration rates have low per capita regional output growth elasticities. Those with net out-migration rates have high per capita growth elasticities. However, it is to be observed that the regions with high in-migration rates are also relatively the ones with high regional growth elasticities in an absolute sense. So, as expected, the population moves into areas where economic opportunity appears to be high. Of

course, such movements have a way of depressing the measures of the per capita output growth elasticities of the regions with high in-migration rates and of showing higher per capita output growth elasticities for regions of out-migration. These are, of course, what have been observed.

The estimates of regional gross product in this study show that the fastest growing region in the Philippines is Rizal Province. Metropolitan Manila and Rizal account for about 1/4 of total gross national product. The Luzon island group accounts for about 59 per cent of total GNP. Mindanao's share to total GNP has been gradually rising. The relative contribution of the Visayas to total GNP has fallen relatively from 1948 to 1966.

In terms of levels of gross regional product per person, Manila has the highest, followed by Rizal. The region with the lowest GRP level is the Cagayan Valley. Metropolitan Manila's GRP is 2.4 times that of Rizal Province, 6 times that of Cagayan Valley.

TECHNICAL APPENDIX

Regional growth elasticity. Let  $y_t$  denote total output, or GNP, in year  $t$ . For a period length given by  $\theta$ , the rate of change of total output from  $t$  to  $t+\theta$  is given by  $(y_{t+\theta} - y_t)/y_t$  or  $\Delta y_t/y_t$ . Let an indicator  $x_t$  be functionally related to  $y_t$ , such that  $x_t = f(y_t)$ . If this relationship is simply linear,  $x_t = \alpha y_t$ , where  $\alpha$  is a constant; obviously,  $\alpha = x_t/y_t$ . If  $\alpha$  does not change, or changes but insignificantly, through time, then we can associate changes in  $x_t$  with changes in  $y_t$ , since

$$(x_{t+\theta} - x_t)/x_t = \alpha(y_{t+\theta} - y_t)/\alpha y_t$$

or

$$\Delta x_t/x_t = \Delta y_t/y_t.$$

Because of the observed relative stability of proportions like  $\alpha$ , it is possible to assume that the indicator is helpful in giving us information about output. We may distinguish the regional indicator from that describing the whole economy by the subscript  $i$  to indicate region  $i$ . Thus, for region  $i$ , the rate of growth of gross regional product (GRP) is

$$\Delta x_{it}/x_{it} = \Delta y_{it}/y_{it}.$$

To derive measures of the growth response of region  $i$  to the growth of the economy, let us define an elasticity concept:

$$\begin{aligned}
 \text{GRP growth elasticity with respect to GNP growth} &= \frac{\Delta x_{it}}{\Delta x_t} \cdot \frac{x_t}{x_{it}} \\
 &= \frac{\alpha_i \Delta y_{it}}{\alpha \Delta y_t} \cdot \frac{\alpha y_t}{\alpha_i y_{it}} \\
 &= \frac{\Delta y_{it}}{\Delta y_t} \cdot \frac{y_t}{y_{it}}
 \end{aligned}$$

Such elasticities can be estimated with the use of more elaborate techniques. However, the regional growth elasticities were estimated by the simple formula,

$$\text{GRP regional growth coefficient} = (\Delta x_{it}/x_{it})/(\Delta x_t/x_t),$$

i.e., the growth rate of indicator  $x_{it}$  for region  $i$  divided by the growth rate of total indicator  $x_t$ .

Adjustments on values of indicators. The above formula is invariant to changes in assumptions about the levels of indicators  $x_{it}$  and consequently of  $x_t$ . Suppose that it is assumed that  $x_{it}$  overstates true  $y_{it}$  by a specific factor, so that an adjustment factor say  $\lambda(>0)$  is necessary. Suppose further that in view of such adjustments, total  $x_t$

has to be adjusted by a corresponding factor  $\mu(>0)$ . If such adjustments are applied uniformly through time, the

$$\begin{aligned}\text{growth coefficient} &= (\lambda \Delta x_{it} / \lambda x_{it}) / (\mu \Delta x_t / \mu x_t) \\ &= (\Delta x_{it} / x_{it}) / (\Delta x_t / x_t).\end{aligned}$$

Bias in rates of change of indicators and the regional growth elasticity. Suppose that

$$\Delta x_{it} / x_{it} \neq \Delta y_{it} / y_{it}$$

and

$$\Delta x_t / x_t \neq \Delta y_t / y_t$$

such that the respective inequalities can be accounted for by proportionality factors  $k_1$  and  $k_2$ ; more precisely,

$$\Delta x_{it} / x_{it} = k_1 \Delta y_{it} / y_{it}$$

$$\Delta x_t / x_t = k_2 \Delta y_t / y_t.$$

What the above equations say is that the indicator does not correctly estimate the growth rate of gross regional product, both on a regional and on a total basis. If the proportionality factors,  $k_1$  and  $k_2$ , are about the same in magnitudes, then the proxy measure of the regional growth elasticities would be the same, that is

$$\frac{\Delta x_{it} / x_{it}}{\Delta x_t / x_t} \approx \frac{\Delta y_{it} / y_{it}}{\Delta y_t / y_t}.$$

This result is important because the growth elasticity based on a surrogate, although imperfect, is able to express the relative growth response of a region to total economic growth, provided of course that the direction of the bias of the regional and total indicators are the same. Experiments with the data used in the study tend to show that indeed, if there were any data bias, the total and regional indicators moved in the same direction.

Price changes. If  $x_t$  and  $y_t$  are valued in current prices, the rates of change measures will not necessarily reflect real growth rates of  $x_t$  and  $y_t$ . But suppose that, in general, price level changes for all regions follow the national price level, as evidently they do in the Philippines. Let  $P_t$  be the general price index and  $P_{it}$  the price index for the region, and let these price weights be attached to magnitudes  $x_t$  and  $x_{it}$ . The regional growth coefficient is

$$= \frac{(P_{it+0} x_{it+0} - P_{it} x_{it}) / P_{it} x_{it}}{(P_{t+0} x_{t+0} - P_t x_t) / P_t x_t}$$

$$= \frac{P_{it}^* x_{it+0} - x_{it}}{P_t^* x_{t+0} - x_t} \cdot \frac{x_t}{x_{it}}$$

where  $P_t^* = \frac{P_{t+0}}{P_t}$  and  $P_{it}^* = \frac{P_{it+0}}{P_{it}}$

Our assumption about regional and national price movements lead us to the result that  $P_{it}^* = P_t^* = P^*$ . It is apparent that if the price level for two periods did not change,  $P^* = 1$ ; we are back to our usual formula. In times of changing prices, when  $P^* \neq 1$ ,  $P^*$  will exert to enlarge or reduce both the first terms of the numerator and denominator by the same proportion. Thus,

$$\frac{P^* x_{it+\theta} - x_{it} \cdot \frac{x_t}{x_{it}}}{P^* x_{t+\theta} - x_t \cdot \frac{x_{it}}{x_{it}}} \approx \frac{\Delta x_{it} \cdot \frac{x_t}{x_{it}}}{\Delta x_t \cdot \frac{x_{it}}{x_{it}}}$$

Clearly, the effects of the changing price level do not distort the values of the growth elasticities. This is why we say that the method of computing regional growth elasticities used in this paper is not affected by current price valuation of the surrogates for gross regional product.