# THE SPATIAL PATTERN OF PHILIPPINE MANUFACTURING

## By

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### Background

There has been a move in recent years to disperse industrial activity in the Philippines. This move has been prompted perhaps largely by equity considerations. It is hoped that industrial dispersion, particularly of manufacturing industries, will distribute the benefits of industrial development more or less uniformly over the different regions of the country. The increase in output and employment that desirable manufacturing activity would generate would have as its immediate beneficiary the people in the (depressed) region where the plant will be located.

Of course, besides equity considerations, the motivations behind such a move would include easing up the pressure of congestion on the country's only industrial center, namely, Metropolitan Manila, and slowing down, if not reversing, the pattern of rural-urban migration. If industrial dispersion takes into account sectoral-spatial linkages (as depicted by a regional input-output table), it may be an approach to the strengthening of rural-urban relations by emphasizing the role of lower-order centers especially in lagging regions. It is known that the Philippines is one of the developing countries in Southeast Asia that are faced with a considerable urban slum problem, a reflection of the inability of the industrial centers' formal sector to absorb the migrants from the country's less industrialized small cities and towns, and rural areas. This is at least one reason that has contributed to the appearance of the phenomenon of "informal sector" in developing countries. Thus, a policy of industrial dispersion is expected to have as one of its important by-products the slowing down of the proliferation of the country's migrants towards its only growth center by enhancing sectoral-spatial interdependence.

Laudable as these objectives are, decentralization of industrial activity must be carried out with caution. The impact of industrial dispersion on the rate of capital formation, employment, income distribution, regional interdependence, and rural-urban relation or industrial-agricultural linkages need to be investigated among others along with the question of which manufacturing industry or industries and which size firms should be the target of such a policy. The latter problem comes in because of sectoral-spatial (urban industrial rural agricultural) interdependence which an industrial dispersion policy must aim to enhance rather than distort or dilute. To this end it is necessary that the policy have a sound theoretical and empirical basis. In this regard, the relevant questions are:

1. What is the existing location pattern of industrial activity in the country?

This question assumes relevance in a policy of industrial dispersion because if industrial activity is more or less uniformly distributed over space already, the existence of progressive and lagging regions must seek explanation from other sources. Thus, quite naturally, the next question is:

2. Is there any relationship between the prevailing spatial pattern of industrial activity and the presence of progressive and depressed areas in the country?

In the context of these questions, first of all one must look into the locational motivation of industrial firms and its consequent industrial location pattern within the framework of a market economy; and, as a sub-issue, examine which industry or industries and which size firms are largely responsible in generating the existing spatial arrangement of industrial activity. Then, a relationship should be struck between the existing pattern of industrial location and some developmental dimensions, e.g. regional productivity, regional per capita income, regional income distribution, etc. Finally, the implications of industrial dispersion — if by some criteria the spatial pattern of industrial activity calls for this — for regional growth and development and its impact on the developmental dimensions and objectives mentioned above may then be investigated.

### Objective and Scope of the Study

This study is addressed primarily to the first and second considerations above, but some implications for regional development are

...lored by way of suggesting these as avenues for policy and for ...ure research. Specifically, the study aims to examine empirically ... regional location pattern of Philippine manufacturing and its ...tionship with the differences in the industry's regional productivity, one of the key developmental indices. By linking differences ... regional productivity with the regional pattern of manufacturing, ... are thus provided with a basis for the policy of industrial dispersion. While not being rigorously linked with the empirical findings, ...ese factors will be shown to have a bearing on the regional pattern ... Philippine manufacturing by way of their effect on its major ...terminants. The regional pattern of Philippine government expenditure on social overhead capital particularly its infrastructure component, and the regional distribution of the more skilled members of ... labor force are examples of such factors.

In this study, "regions" refer to the eleven regional groupings of ... country's provincial and urban areas (shown by the map). A ...ore economically based regional reclassification is not attempted ...e to the enormity of the task. Besides, we are concerned here with ... location pattern of manufacturing which is quite independent of ...atever noneconomic considerations are involved behind the ...untry's regional delineation.

## The Theoretical Framework

We conceive a locational decision-making process of industrial ...rm in which profits exercise the *major* locational pull. "Noneconomic" factors play but a passive role.
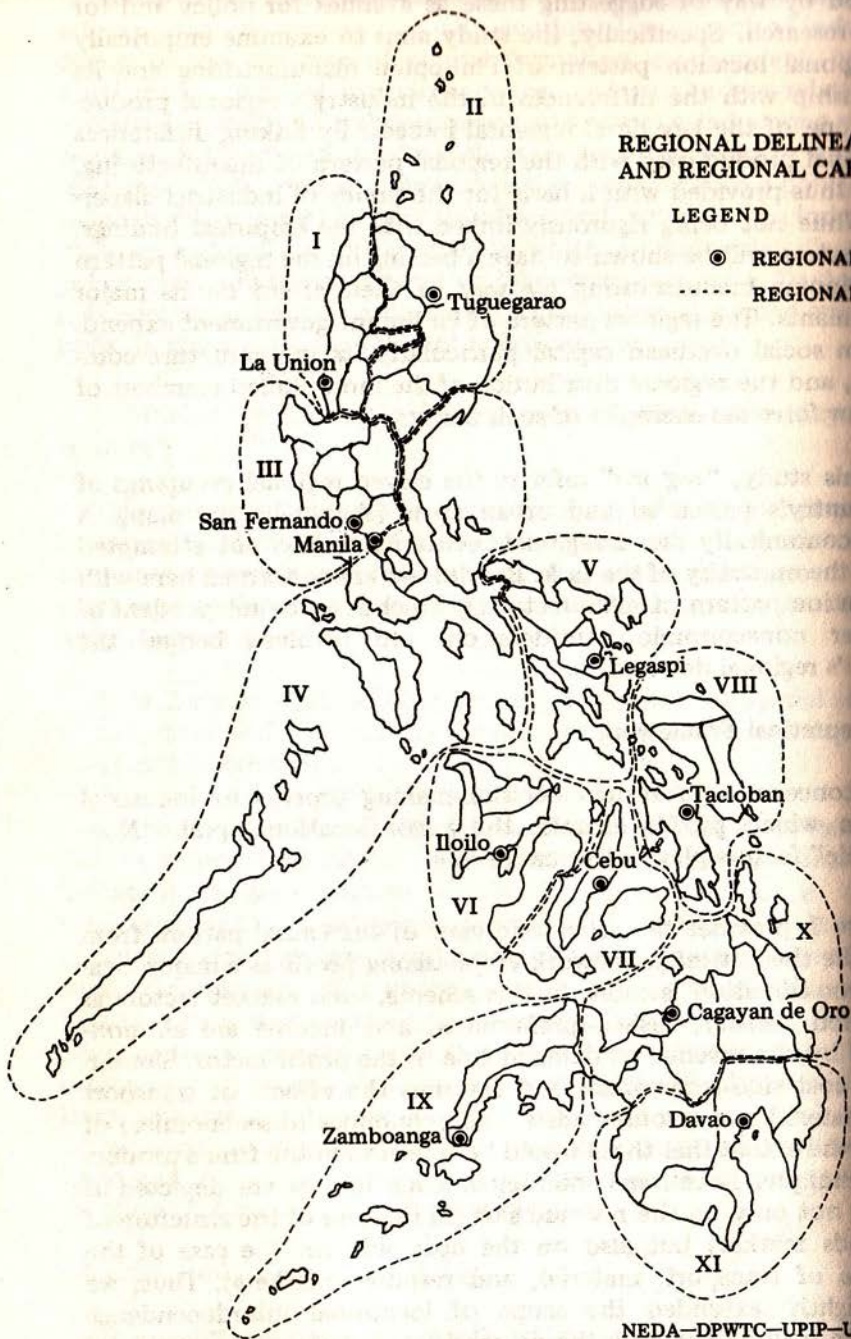
Figure 1 provides the schematic view of the causal pattern from ...ich the theoretical framework emphasizing profit as a major locational consideration is built. In this scheme, such market factors as ...pulation density, tastes, preferences, and income are all *summarized* by the revenue or demand side of the profit factor. Similarly, the cost side summarizes and captures the effects of transport ...sts, material and resource costs, and economies (diseconomies) of ...ale to the extent that these would be reflected in the firm's production technique. Locational interdependence factors are depicted as ...ting not only on the revenue side (in the case of the structure of ... goods market) but also on the cost side (in the case of the ...ture of transport, material, and resource markets). Thus, we ...e slightly extended the scope of locational interdependence ...tors to include not only the demand side but also the cost side of ... profit factor. As shown by the scheme, the *combined* effects of

REGIONAL DELINEATION
AND REGIONAL CAPITAL

LEGEND

⊙ REGIONAL CAPITAL
····· REGIONAL BOUNDARY

NEDA—DPWTC—UPIP—UNDP
NATIONAL PHYSICAL PLANNING
MARCH, 1973

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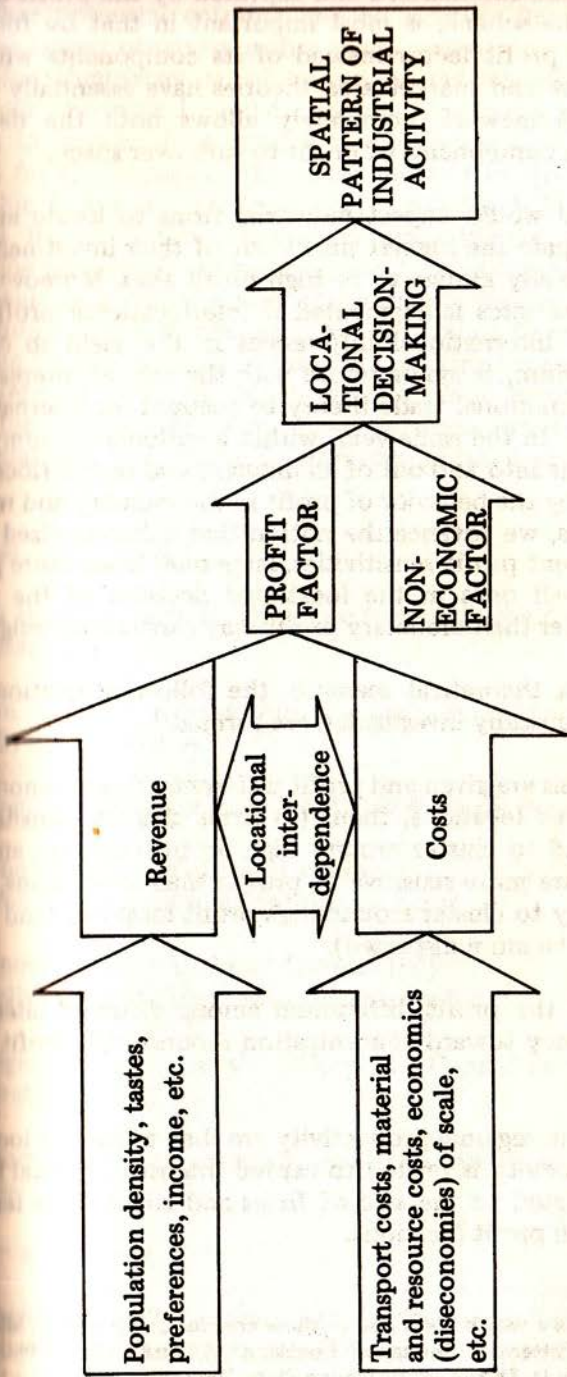
**Figure 1**

**Schematic Diagram of the Causal Pattern**

SPATIAL PATTERN OF INDUSTRIAL ACTIVITY

LOCATIONAL DECISION-MAKING

PROFIT FACTOR

NON-ECONOMIC FACTOR

Revenue

Locational inter-dependence

Costs

Population density, tastes, preferences, income, etc.

Transport costs, material and resource costs, economics (diseconomies) of scale, etc.

revenue and cost are summarized and captured by the profit fa[...]
This feature of the scheme is most important in that by foc[...]
attention on the profit factor instead of its components whi[...]
what the least-cost and market area theories have essentially d[...]
our theoretical framework completely allows both the dem[...]
(revenue) and cost components of profit to vary over space.

Intuitively, one would expect industrial firms to locate at [...]
where they anticipate the highest profit out of their investment [...]
these sites are already known to be high profit sites. Moreover, [...]
attraction of these sites is augmented if interlocational profi[...]
ferential is large. International differences in the yield to ca[...]
which, in equilibrium, is synonymous with the rate of interest, [...]
been held by international trade theory to account for internat[...]
capital movement. In the same vein, within a national economy, [...]
movement of firms into and out of an industry *and* region (locat[...]
is brought about by the behavior of profit in the industry and re[...]
In addition to this, we advance the notion that different sized fi[...]
would have different profit sensitivities, large ones being more p[...]
sensitive than small ones in the locational decision of the la[...]
considerations other than monetary profit may carry some weight[...]

With this for a theoretical scenario, the following relation[...]
which may be empirically investigated are formed:[1]

1. If profit levels are given and profit differentials exist among [...]
different geographic locations, then: (a) firms that are sensitiv[...]
profits would tend to cluster around high profit locations; and [...]
since large firms are more sensitive to profits than small firms, [...]
will be more likely to cluster around high profit locations (and [...]
firms will tend to be more dispersed).

2. The greater the profit differential among different sites, [...]
greater the tendency toward concentration around high profit l[...]
tions.

3. Differences in regional productivity are then related to loca[...]
as follows: Productivity is related to capital intensity. Capital in[...]
sity is in turn related to the size of firms and larger firms tend [...]
cluster around high profit locations.

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[1] The formal theory which gives rise to these conclusions is in C.V. Mir[...]
Jr., "The Regional Pattern of Industrial Location: A Study of the Phil[...]
Space Economy," (Ph.D. Dissertation, Wayne State University, 1977).

...ther potential entrants and all existing firms would in fact
...the largest observed profits at the various sites where they have
...mitted themselves is, of course, an entirely different question
...our theoretical model and empirical investigation will not
...to answer. In general, the theoretical framework does not
...for the impact of the entry and exit of firms at the various
...phic points on interlocational profit levels in an industry or,
...that matter, on interlocational-interindustrial profit behavior.
...ing as these problems are, they involve temporal changes and
...ments and hence would appropriately belong to the province
...tional dynamic analysis. Our theoretical framework purports
...lain through a locational decision-making process no more than
...tern of industrial location at a point in time, although it
...for comparative static analysis when interlocational profit
...ntial and industrial concentration are seen at different points
...me.

## ...ical Methodology

...th the above relationships, we formulate the following testable
...theses.

...m the first relationship, we have the following hypotheses
...(2) is a "sub-issue."

...gional Concentration Level = F(Regional Profit Level)

...ncentration = G(Size of Firms)
...from the second relationship, we have:

...ncentration = H(Profit Differential)
...nally, from the third relationship, we have:

...gional Productivity = J(Regional Capital per Man; Regional
...ration Level)

...rresponding regression models to test these hypotheses are
...lows:

...H = a + bP + e

...gression will be done for the "sub-issue" for lack of suf-
...servations and since available data would suffice to show the
...positive relationship between C and G in the "sub-issue,"

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2. $C = G(S)$

For the second relationship, the model is:

3(a) $C^* = a^* + b^*P^* + e^*$

the logarithmic form of which is:

3(b) $\text{Log } C^* = \text{Log } A^* + b^* \text{ Log } P^* + e^*$

For the third relationship, we use an equation relating regional productivity as measured by regional output per man and, regional capital per man and regional concentration level, i.e.:

4(a) $(Q/L) = a_1 + b_1 Z + e_1$

Where $Z = (K/L)(N/M)$

The logarithmic form of 4(a) is:

4(b) $\text{Log }(Q/L) = \text{Log } A_1 + B_1 \text{ Log } Z + e_1$

Notations:

N : Regional Concentration Level, i.e., the regional distribution of firms in the industry

M : The country's total number of manufacturing establishments

P : Regional Profit Level

C : Concentration as measured by "Gini ratios"

S : Size of Firms as measured by employment or fixed assets

$C^*$ : Concentration as measured by the coefficient of variation of the regional distribution of firms in an industry

$P^*$ : Profit Differential as measured by the coefficient of variation of regional output per man (proxy for profit)

Q/L : Regional Productivity as measured by regional output per man

# Regional Capital per Man

Error term

...ion models 4(a) and 4(b) are intended to capture the role ...distinguished from *influence* — of the spatial pattern of distribu- ...firms in regional productivity. Here the regional capital-labor ...interacting with the pattern of geographic distribution of firms ...mine regional productivity. In other words, the capital-labor ...that goes into the regression equation as an independent vari- ...reflects the role of the pattern of regional distribution of the ...For if the regional level of concentration were treated sepa- ...from capital-intensity, it would appear as though it has an ...ence on productivity independently of factor proportion. Thus, ...count for the desired reflection of the role of geographic space ...pital per man, the relative regional distribution of firms is used ...weighting factor for capital per man. This capital per man ...ed by the proportion of the number of establishments in the ...to the country's total number of establishments is then ...yed as the independent variable in the regression model 4(a) or ...rithmic form, 4(b).

...expect a positive relationship between the dependent and ...dent variables in all of the above models to accord with the ...ical relationships advanced.

...Requirement of the Study

...ing to the absence of time-series data — the ideal data for ...gating the second conclusion — we resort to a cross-sectional ...which is quite appropriate for a static model. Moreover, the ...tional approach avoids problems arising from intertemporal ...level changes which would affect the measurement of profits, ...ularly among various locations (regions).

...data required for investigating the first theoretical conclusion ...ional profit and concentration levels, and the regional distribu- ...firms of different sizes as measured by employment or fixed ...A positive relationship between regional profit and concentra- ...levels, and between the measure of relative concentration ...ion) and the size of firms would constitute empirical evidence ...theoretical prediction and its "sub-issue."

...are certain empirical problems that may hamper straight- ...comparison of relative profit levels and the levels of con-

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centration, whether the study employs time-series or cross [...]
data, there is the possible lack of significant positive rela[...]
between profits and concentration levels because of the l[...]
adjustment process in the industry. In other words, as firms en[...]
industry and locate at the site that shows the highest level of [...]
eration, profits at that site would tend to be depressed. Th[...]
happen despite a large and even rising profit differential[...]
locations. What the data might then show is a relatively low[...]
level at the location(s) where industrial concentration level [...]
high.

There is a second problem of whether or not the empirical [...]
should include only small and medium size firms with more [...]
localized markets, excluding very large firms whose market [...]
the whole nation — or even the world (as in the case of large f[...]
the export industries). These large firms that cater to the na[...]
and/or the world markets would tend to seek the least-cost [...]
over a national or global range, a perspective irrelevant to sma[...]
medium size firms that cater to localized markets. For large [...]
the more relevant profit differential is not "national profit di[...]
tial" but "global profit differential" in the industry; that is, the [...]
appropriate profit differential for very large firms would be [...]
country profit differential. These firms would tend to disto[...]
relative profit levels vis-a-vis the industrial concentration pic[...]
the nation because while they may be making huge profits, the[...]
however, be located at the site where the least concentration [...]
Classification of firms according to size and extent of market [...]
however, require measurement of the export component of [...]
firm's total output, the data for which are not available.

All data that this study can make use of are available fo[...]
census year 1967.[2] A publication[3] showing the plant addre[...]
some of the country's top manufacturing firms, their net in[...]
and total assets, and their industrial classification, is available [...]
same year. This makes possible identification of the firms, the[...]
incomes, etc., by region. The largest profits observed in each [...]
are used rather than each region's average, for the following re[...]
(a) to correct the problem arising from long-run adjustme[...]

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[2] The basic data used in this study were obtained from the National Ec[...]
and Development Authority and the National Census and Statistics Offi[...]
results of the 1972 census are still being processed and are not yet avail[...]
least for the most part, as of the time of this study.

[3] "The 1,000 Top Philippine Corporations," *Business Day*, (Quezo[...]
Philippines: Enterprise Publications, Inc., 1968).

industry as discussed above; (b) to avoid the downward bias
injected into the average by undervaluation of profits; (c) to avoid
downward bias injected into the average by small firms that earn
low profits; and (d) to accord with the reasonable presumption
firms base their locational decision on the large profits being
at the various locations rather than on the low profits of
unsuccessful firms.

Of the 1,000 top Philippine corporations covered by *Business Day*,
only 378 are manufacturing firms of which only a few reported their
incomes. Hence, not enough observations for each industry are
available for a meaningful regression. The rate of profit should, of
course, be the ratio of net income (defined as gross sales minus total
cost) to fixed assets. Data on fixed assets by region and by industry
are not available. Although not an ideal measure, the ratio of net
income to total assets as reported by the manufacturing corporations
instead had to be used.

Turning to our investigation of the second theoretical relationship,
the required cross-sectional data would ideally be relative profit
levels by region and by the 2-digit level component industries of
manufacturing. Again, these data are not available, but output per
man by region and by the 2-digit level component industries of
manufacturing are available. These data on output per man will be
used as proxies for regional profit levels. This choice is a reasonable
one since we are here concerned with locational analysis, the
presence of agglomeration economies[4] which may vary positively
with concentration would give rise to the positive relationship
between profits and output per man.

For the last theoretical conclusion, the study is limited to eleven
observations only for capital per man. Data on capital per man by
region and by the 2-digit level *component* industries of manufactur-
ing are not available but only for manufacturing as a whole, by
region.

## The Regional Pattern of Industrial Activity

### Regional Concentration and Profit Levels

To begin with, Table 1 shows the regional location pattern of large
and small manufacturing establishments by industry group. Region

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Yngve Aberg, "Regional Productivity Differences in Swedish Manufactur-
ing," *Regional and Urban Economics,* III:2 (1973), pp. 131-155.

| Region ISIC Code | Industry Group | I Ilocos | II Cagayan | III Central Luzon | IV Southern Tagalog | V Bicol | VI Western Visayas | VII Central Visayas | VIII Eastern Visayas | IX Western Mindanao | X Northern Mindanao | XI Southern Mindanao | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Food, manufactured | 51 | 38 | 89 | 454 | 70 | 129 | 119 | 34 | 16 | 57 | 55 | 1,112 |
| 21 | Beverages | 6 | 4 | 6 | 26 | 2 | 9 | 11 | 4 | 1 | 2 | 4 | 75 |
| 22 | Tobacco | 4 | 4 | 2 | 28 | 3 | — | — | — | — | — | — | 41 |
| 23 | Textiles | 2 | — | 12 | 86 | 13 | 1 | 3 | — | — | — | — | 119 |
| 24 | Footwear, other wearing apparel | 4 | 3 | 45 | 349 | 10 | 24 | 35 | 7 | 6 | 12 | 9 | 504 |
| 25 | Wood and cork | 12 | 30 | 39 | 107 | 27 | 10 | 14 | 8 | 14 | 47 | 47 | 355 |
| 26 | Furnitures and fixtures | 4 | — | 13 | 101 | 1 | 3 | 19 | 1 | 1 | 2 | 7 | 152 |
| 27 | Paper, paper products | — | — | 5 | 65 | — | 1 | 4 | — | — | — | 1 | 76 |
| 28 | Printing | 6 | 3 | 3 | 170 | 2 | 14 | 18 | 2 | — | 3 | 8 | 229 |
| 29 | Leather, leather products | 2 | — | 11 | 9 | 1 | 1 | 1 | — | — | — | — | 23 |
| 30 | Rubber products | — | — | — | 26 | 1 | 1 | 3 | — | — | 3 | 3 | 39 |
| 31 | Chemicals, chemical products | 4 | 1 | 14 | 141 | 1 | 6 | 16 | — | 1 | 6 | 3 | 192 |
| 32 | Products of petroleum and coal | — | — | 1 | 9 | — | — | — | — | — | — | — | 10 |
| 33 | Non-metallic substances | 6 | 2 | 22 | 106 | 3 | 19 | 17 | — | 1 | 6 | — | 183 |
| 34 | Basic metals | — | — | 5 | 49 | 1 | 4 | 3 | — | 1 | 1 | 7 | 66 |
| 35 | Metal products | 2 | 1 | 25 | 179 | 1 | 3 | 15 | — | 1 | 6 | 7 | 232 |
| 36 | Machinery, except electrical | 1 | 1 | 10 | 88 | — | 17 | 5 | — | 1 | 1 | 4 | 130 |
| 37 | Electrical machinery, appliances | 1 | — | 4 | 91 | — | — | 4 | — | — | 5 | 4 | 130 |
| 38 | Transport equipment | 7 | 1 | 14 | 181 | 3 | 6 | 19 | 1 | 3 | — | 14 | 249 |
| 39 | Miscellaneous | — | 1 | 9 | 102 | 4 | 2 | 8 | — | 2 | — | 1 | 128 |
| | **Total Large Establishments** | 112 | 87 | 232 | 2,367 | 141 | 249 | 314 | 55 | 48 | 145 | 165 | 4,015 |
| | Percent of National Total | 2.8 | 2.2 | 8.3 | 59.0 | 3.5 | 6.2 | 7.8 | 1.3 | 1.2 | 3.6 | 4.1 | 100.0 |
| | **Total Small Establishments** | 3,885 | 1,487 | 4,327 | 12,936 | 2,336 | 4,613 | 3,192 | 1,497 | 1,222 | 2,180 | 3,313 | 41,018 |
| | Percent of National Total | 9.5 | 3.6 | 10.6 | 31.5 | 5.8 | 11.2 | 7.8 | 3.6 | 3.0 | 5.3 | 8.1 | 100.0 |
| | **TOTAL SMALL AND LARGE ESTABLISHMENTS** | 3,997 | 1,574 | 4,659 | 15,303 | 2,507 | 4,862 | 3,506 | 1,552 | 1,270 | 2,325 | 3,478 | 45,033 |
| | Percent of National Total | 8.9 | 3.5 | 10.3 | 34.0 | 5.6 | 10.8 | 7.8 | 3.4 | 2.8 | 5.2 | 7.7 | 100.0 |

Sources: Republic of the Philippines, National Economic and Development Authority, Manila; National Census and Statistics Office, Manila

Note: Small establishments are those employing less than 10 persons; large establishments are those employing at least 10 persons as defined by the National Census and Statistics Office.

IV, Southern Tagalog, where Metropolitan Manila is geographically located, is seen to account for more than half the number of the country's large manufacturing establishments, and for about one-third the number of the country's small establishments. In this region, the heaviest concentration of large manufacturing establishments occurred in all industries in 1967 (except Leather and Leather Products). Other regions that exhibited relatively higher industrial agglomeration than the rest of the country's regions are Regions I, III (which is geographically adjacent to Region IV), VI, VII, and XI for small establishments; Regions III, VI, and VII for large establishments.

In the absence of data on profits for Table 1, the published data for the top 1,000 Philippine corporations (ranked according to sales volume) are used in looking into the relationship between regional concentration and profit levels. The data obtained are shown in Table 2. A positive relationship between the number of firms (concentration level) and relative profit levels is indicated for each industry. This is shown more clearly in Figure 2 for industries with at least two pairs of regional observations.

Taking all industries together, the (OLS) regression of the number of establishments (N) on regional profit level (P) is:

$$N = -0.59 + 0.71\ P$$

$$(0.08)$$

$$R^2 = 0.644$$

With respect to the relationship between concentration and the size of firms in the "sub-issue", Table 1 already suggests that small establishments are relatively more dispersed than large establishments. While the coefficient of variation of the regional totals for small establishments is 83.6 per cent, that for large establishments is 116.8 per cent. Furthermore, the proportion of each region's number of large establishments in the country's total is relatively smaller than that of small establishments indicating that as the size of firms increases, agglomeration tends to occur at fewer locations. While there are eight regions with at least 5.0 per cent of the country's total number of small establishments, there are only four regions with at least the same share in the country's total number of large establishments.

TABLE 2

Number of Large Manufacturing Establishments (N) Among the Philippines'
Top 1,000 Corporations, and Highest Net Income to Total Assets Ratio (r),
By Region, By Industry Group, 1967

| ISIC Code | Industry | | I Ilocos | II Cagayan | III Central Luzon | IV Southern Tagalog | V Bicol | VI Western Visayas | VII Central Visayas | VIII Eastern Visayas | IX Western Mindanao | X Northern Mindanao | XI Southern Mindanao |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Food, manufactured | r (percent) | | | 8.3 | 30.8 | | 28.7 | 10.7 | | | 1.7 | |
| | | N | | | 5 | 38 | | 11 | 6 | | | 1 | |
| 21 | Beverages | r | | | | 38.1 | | | 14.5 | | | | |
| | | N | | 1 | | 9 | | | 2 | | | | |
| 22 | Tobacco products | r | | | | 19.2 | | | | | | | |
| | | N | | | | 16 | | | | | | | |
| 23 | Textiles | r | | | 3.4 | 35.4 | | | | | | | |
| | | N | | | 4 | 30 | | | 2 | | | | |
| 24 | Footwear, other wearing apparel | r | | | | 14.5 | | | | | | | |
| | | N | | | | 6 | | | | | | | |
| 25 | Wood and cork products | r | | 3.3 | 2.8 | 49.2 | 18.8 | 4.2 | 15.5 | | 9.1 | 8.7 | 89.4 |
| | | N | 1 | 2 | 2 | 19 | 2 | 1 | 2 | | 1 | 3 | 6 |
| 26 | Furniture and fixtures | r | | | | | | | | | | | |
| | | N | | | | 1 | | | | | | | |
| 27 | Paper and paper products | r | | | 0.1 | 9.7 | | | 0.5 | | | 9.7 | |
| | | N | | | 1 | 14 | | | 1 | | | 2 | |
| 28 | Printing and publishing | r (percent) | | | | | | | | | | | |
| | | N | | | | 1 | | | | | | | |
| 29 | Leather and leather products | r | | | | 0.2 | | | | | | | |
| | | N | | | | 2 | | | | | | | |
| 30 | Rubber products | r | | | | 18.9 | 0.5 | | | | | 1.5 | |
| | | N | | | | 13 | 1 | | 1 | | | 1 | |
| 31 | Chemicals, chemical products | r | | | 1.7 | 66.9 | | | 3.5 | | | | |
| | | N | | | 1 | 64 | | | 2 | | | | |
| 32 | Products of petroleum and coal | r | | | 4.6 | 9.8 | | | | | | | |
| | | N | | | 1 | 3 | | | | | | | |
| 33 | Non-metallic substances | r | | | | 10.6 | | 6.4 | | | | | |
| | | N | | | 1 | 16 | | 1 | | | | | |
| 34 | Basic metals | r | | | 1.2 | 15.7 | | | 0.2 | | | | |
| | | N | | | 3 | 33 | | | | | | | |
| 35 | Metal products | r | | | | | | | | | | | |
| | | N | | | | 4 | | | | | | | |
| 36 | Machinery, except electrical | r | | | | | | | | | | | |
| | | N | | | | 2 | | | | | | | |
| 37 | Electrical machinery, appliances | r (percent) | | | | 18.9 | | | | | | | |
| | | N | | | | 11 | | | | | | | |
| 38 | Transport equipment | r | | | 5.5 | 9.9 | | | | | | | |
| | | N | | | 1 | 10 | | | | | | | |
| 39 | Miscellaneous | Total Number of Establishments | 1 | 3 | 21 | 290 | 3 | 13 | 18 | 1 | 3 | 10 | 9 |

Source of basic data: "Top 1,000 Corporations," *Business Day*, (Quezon City: Enterprise Publications, Inc., 1967)

Note: The 1,000 top corporations were obtained (by *Business Day*) from a ranking of the firms according to sales volume during the year. The 372 manufacturing establishments out of the 1,000 corporations, had a sales volume of at least P1 M, total asset size of at least P500,000, and employment size of at least 10 (according to the employment size code shown) in 1967. The total of 372 shown in this table does not include the manufacturing firms belonging to the different industry groups since their addresses were not shown; also, many did not report their net income to total assets but only their sales volume.
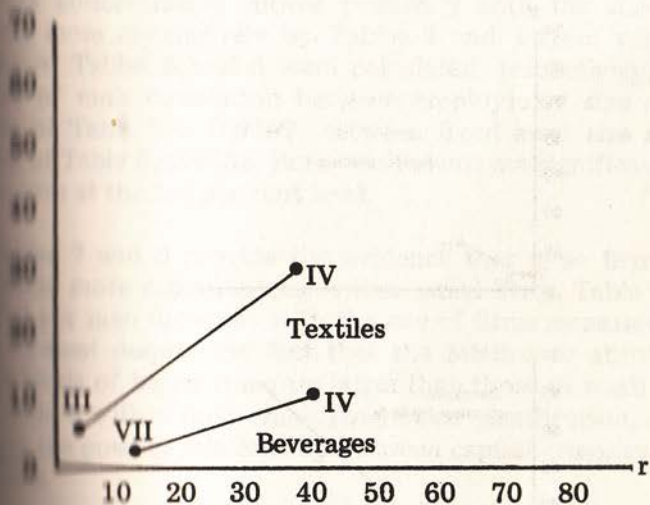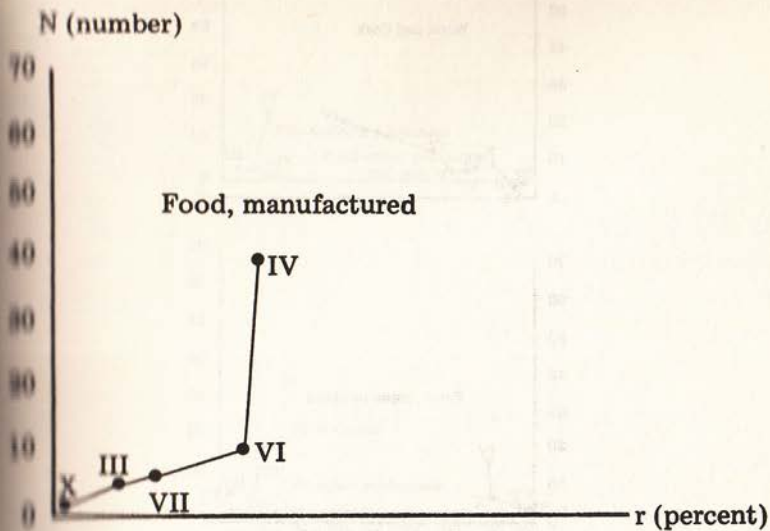
**Figure 2 (1 of 4)**

Scatter Diagrams for Industries with at least Two Pairs of
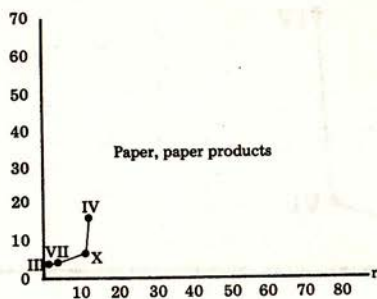Regional Observations in Table 12

Wood and Cork

Paper, paper products

Figure 2 (2 of 4)
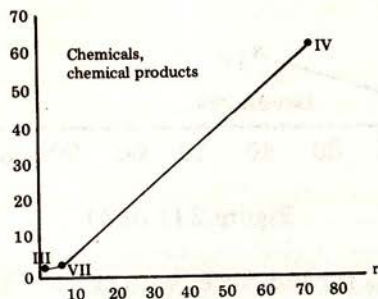


Rubber products

Chemicals, chemical products
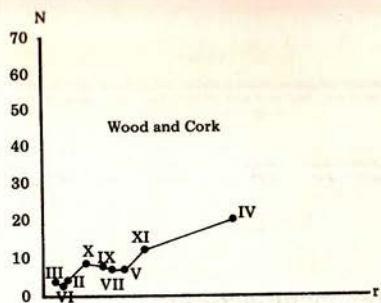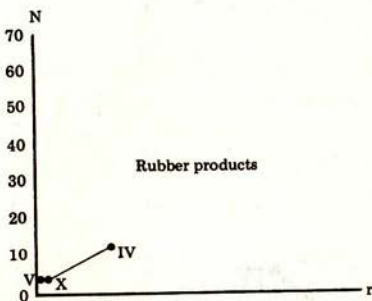
Figure 2 (3 of 4)
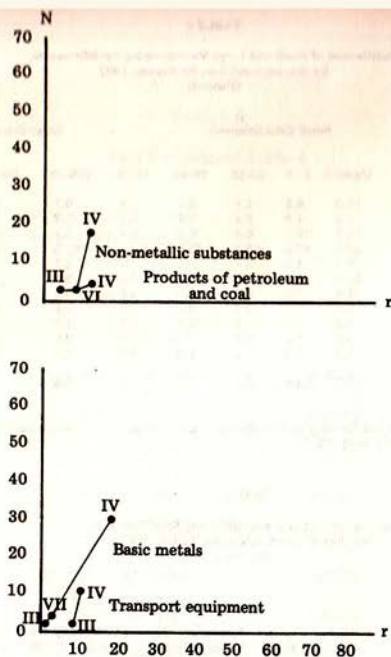
Figure 2 (4 of 4)

That concentration moves positively with the size of firms is seen more conclusively by Tables 3 and 4 from which the Gini of Tables 5 and 6 were calculated, respectively. The coefficients of rank correlation between employment size and the Gini of Table 5 is 0.9167; between fixed asset size and the Gini of Table 6, 0.9333. Both coefficients are significantly different from zero at the 1.0 per cent level.

Tables 7 and 8 provide the evidence that large firms are indeed relatively more capital-intensive than small firms. Table 7 shows that capital per man increases with the size of firms measured in terms of employment despite the fact that the relative or absolute employment levels of bigger firms are larger than those of small firms. Finally, Table 8 with a finer employment size classification, depicts more clearly the positive relationship between capital-intensity and the size of firms.

## Concentration and Interregional Profit Differentials

The objective of this part of the study is to explain the effect of interregional profit spread upon concentration. Since this is to be done with the use of cross-sectional data, the nineteen 2-digit level

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TABLE 3

Distribution of Small and Large Manufacturing Establishments,
By Employment Size, By Region, 1967
(Percent)

| Region | Small Establishments | | | | Large Establishments | | | | 1,000 & over |
|---|---|---|---|---|---|---|---|---|---|
| | Under 5 | 5 - 9 | 10-19 | 20-49 | 50-99 | 100-199 | 200-499 | 500-999 | |
| I — ILOCOS | 10.0 | 6.2 | 4.1 | 2.4 | 1.1 | 0.7 | 2.5 | — | — |
| II — CAGAYAN VALLEY | 3.9 | 1.9 | 2.4 | 1.7 | 3.0 | 1.7 | 2.1 | — | |
| III — CENTRAL LUZON | 10.3 | 12.1 | 8.4 | 8.2 | 9.1 | 9.4 | 6.0 | 5.2 | 10.0 |
| IV — SOUTHERN TAGALOG | 30.5 | 37.5 | 50.8 | 63.0 | 68.5 | 67.2 | 65.7 | 67.4 | 67.1 |
| V — BICOL | 6.0 | 4.4 | 5.1 | 3.4 | 0.7 | 2.1 | 1.7 | — | — |
| VI — WESTERN VISAYAS | 11.6 | 9.4 | 9.0 | 5.2 | 2.6 | 2.8 | 1.3 | 6.3 | 7.1 |
| VII — CENTRAL VISAYAS | 7.6 | 8.6 | 8.9 | 8.2 | 5.6 | 6.3 | 7.2 | 2.1 | 6.7 |
| VIII — EASTERN VISAYAS | 3.7 | 3.1 | 2.2 | 0.4 | 0.7 | 1.1 | 2.1 | — | — |
| IX — WESTERN MINDANAO | 2.9 | 3.6 | 1.4 | 1.1 | 0.7 | 1.4 | 1.7 | 1.1 | — |
| X — NORTHERN MINDANAO | 5.2 | 6.2 | 3.6 | 3.1 | 4.0 | 2.8 | 4.2 | 7.4 | 4.4 |
| XI — SOUTHERN MINDANAO | 8.3 | 7.0 | 4.1 | 3.3 | 4.0 | 4.5 | 5.5 | 10.5 | 9.6 |
| Total by Employment Size | 77.7 | 13.4 | 3.9 | 2.5 | 1.0 | 0.6 | 0.5 | 0.2+ | 0.6 |

Sources of basic data: National Economic and Development Authority, Manila; Bureau of the Census and Statistics, Manila, *Economic [...] the Philippines, 1967*, Vols. III, IX

TABLE 4

Distribution of Large Manufacturing Establishments,
By Size of Fixed Assets, By Region, 1967
(Percent)

| Region | SIZE OF FIXED ASSETS | | | | | | | | 1,000,000 and over |
|---|---|---|---|---|---|---|---|---|---|
| | Under P1,000 | 1,000-4,999 | 5,000-9,999 | 10,000-24,999 | 25,000-49,999 | 50,000-99,999 | 100,000-499,999 | 500,000-999,999 | |
| I — ILOCOS | 3.8 | 3.2 | 6.1 | 2.2 | 4.6 | 5.2 | 1.2 | 1.4 | 0.8 |
| II — CAGAYAN VALLEY | 5.2 | 1.9 | 2.3 | 1.6 | 3.4 | 2.3 | 2.1 | 1.4 | 0.4 |
| III — CENTRAL LUZON | 9.0 | 6.6 | 6.1 | 7.5 | 7.6 | 11.0 | 9.2 | 8.3 | 7.4 |
| IV — SOUTHERN TAGALOG | 43.3 | 46.2 | 49.2 | 64.3 | 58.4 | 57.0 | 61.4 | 68.3 | 70.4 |
| V — BICOL | 4.6 | 7.4 | 8.3 | 2.9 | 4.4 | 2.3 | 2.8 | 1.7 | 0.7 |
| VI — WESTERN VISAYAS | 9.8 | 9.8 | 7.2 | 5.3 | 6.9 | 4.0 | 6.0 | 3.4 | 4.4 |
| VII — CENTRAL VISAYAS | 11.0 | 13.2 | 9.1 | 7.8 | 7.8 | 7.3 | 6.8 | 6.6 | 4.4 |
| VIII — EASTERN VISAYAS | 2.6 | 2.9 | 3.0 | 1.3 | 0.5 | 0.8 | 1.0 | 1.0 | 0.1 |
| IX — WESTERN MINDANAO | 1.7 | 1.6 | 1.9 | 1.8 | 0.7 | 0.8 | 1.0 | 1.0 | 0.8 |
| X — NORTHERN MINDANAO | 5.2 | 4.0 | 3.8 | 2.0 | 1.1 | 3.5 | 4.2 | 2.1 | 5.4 |
| XI — SOUTHERN MINDANAO | 3.8 | 2.9 | 3.0 | 3.3 | 4.6 | 5.8 | 4.3 | 4.8 | 5.5 |
| TOTAL | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Sources of basic data: National Economic and Development Authority, Manila; Bureau of the Census and Statistics, Manila, *Economic [...] of the Philippines, 1967*, Vol. III.

TABLE 5

Gini Ratios from Table 3

| Employment Size | Gini Ratio |
|---|---|
| **Small Establishments** | |
| Under 5 | 0.2014 |
| 5 - 9 | 0.2812 |
| 10 - 19 | 0.4086 |
| 20 - 49 | 0.5336 |
| **Large Establishments** | |
| 50 - 99 | 0.5890 |
| 100 - 199 | 0.5734 |
| 200 - 499 | 0.5514 |
| 500 - 999 | 0.6358 |
| 1,000 and over | 0.6192 |

## TABLE 6

### Gini Ratios from Table 4

| Size of Fixed Assets, Large Manufacturing Establishments (Pesos) | Gini Ratio |
|---|---|
| Under P1,000 | 0.3412 |
| 1,000 - 4,999 | 0.4055 |
| 5,000 - 9,999 | 0.3806 |
| 10,000 - 24,999 | 0.5290 |
| 25,000 - 49,999 | 0.4892 |
| 50,000 - 99,999 | 0.4910 |
| 100,000 - 499,999 | 0.5436 |
| 500,000 - 999,999 | 0.5814 |
| 1,000,000 and over | 0.6072 |

## TABLE 7

### Manufacturing Establishments With 5 Or More Workers, 1956-1969

| Establishments With 5-19 Workers | | | | Establishments With 20 Or More Workers | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| Number of Establishments (Percent) | Employment (Percent) | Output per man (P1,000 per man) | Capital per man (P1,000 per man) | Number of Establishments (Percent) | Employment (Percent) | Output per man (P1,000 per man) | Capital per man (P1,000 per man) | Number of Establishments (Percent) | Employment (Percent) |
| 74.0 | 26.7 | 6.39 | 1.90 | 26.1 | 73.3 | 13.22 | 5.56 | 100.0 | 100.0 |
| 72.0 | 22.7 | 6.04 | 1.86 | 28.0 | 77.3 | 13.85 | 5.77 | 100.0 | 100.0 |
| 73.4 | 21.9 | 6.84 | 2.15 | 26.6 | 78.1 | 15.46 | 6.39 | 100.0 | 100.0 |
| 74.8 | 22.2 | 6.60 | 2.33 | 25.2 | 77.8 | 16.92 | 6.38 | 100.0 | 100.0 |
| 73.9 | 20.0 | 7.78 | 1.86 | 26.1 | 80.0 | 17.82 | 7.22 | 100.0 | 100.0 |
| 74.3 | 17.2 | 6.14 | 2.50 | 25.7 | 82.8 | 22.15 | 9.06 | 100.0 | 100.0 |
| 74.9 | 16.7 | 7.42 | 2.33 | 25.1 | 83.3 | 25.33 | 9.96 | 100.0 | 100.0 |
| 72.7 | 15.9 | 9.21 | 3.18 | 27.3 | 84.1 | 26.15 | 10.66 | 100.0 | 100.0 |
| 72.8 | 15.5 | 8.88 | 4.22 | 27.2 | 84.5 | 25.67 | 11.67 | 100.0 | 100.0 |
| 74.8 | 15.7 | 9.59 | 3.90 | 25.8 | 84.3 | 27.95 | 13.61 | 100.0 | 100.0 |
| 76.3 | 17.5 | 10.51 | 6.26 | 23.7 | 82.5 | 32.46 | 14.18 | 100.0 | 100.0 |
| 79.3 | 17.4 | 10.34 | 4.95 | 20.7 | 82.6 | 33.95 | 15.15 | 100.0 | 100.0 |
| 74.4 | 19.1 | 7.98 | 3.12 | 25.6 | 80.9 | 22.58 | 9.63 | 100.0 | 100.0 |

Has = Gross Value of Output/Employment

Has = Book Value of Fixed Assets, Dec. 31/Employment

1969 were not calculated because the data used by the UP-BCS and IDE for these two years were for all (i.e. total number of) Figures for establishments with 5-19 workers were obtained by deducting the figures for establishments with 20 or more corresponding figures for establishments with 5 or more workers.

Source data: UP-BCS and Institute of Developing Economies, *Manufacturing Statistics of the Philippines, 1956-1970*, Series No. 1 (Tokyo: Asian Economic Press, 1974)

TABLE 8

**Capital Per Man and Value Added Per Man
in Manufacturing, By Employment Size, 1970
(P1000 per man)**

| Employment Size | Value Added per man | Capital per man |
|---|---|---|
| 5 - 19 | 2.84 | 4.44 |
| 20 - 49 | 5.83 | 8.95 |
| 50 - 99 | 8.68 | 10.52 |
| 100 - 199 | 12.67 | 15.31 |
| 200 + | 13.77 | 18.20 |
| All | 12.46 | |

Note: Capital per man = Book Value of Fixed
Capital/Employment

Source: International Labor Office, *Sharing
in Development: A Programme of
Employment, Equity and Growth
for the Philippines*, (Geneva: ILO,
1974), p. 144

component industries of large manufacturing establishments provi
the observations for interregional profit differentials. The mea
we employ is the coefficient of variation of the industries' regio
output per man shown in Table 9. Similarly, for our measure
concentration, the dependent variable, we use the coefficient
variation of the industries' regional distribution of large manufac
ing establishments shown in Table 1. Table 10 shows the coeffici
of variation calculated from Tables 1 and 9 for each of the nine
component industries of manufacturing. A significant posi
relationship between industrial concentration, C*, and profit
ferentials across regions, P*, would indicate empirical evidence
the second theoretical relationship that the greater the profit spr
across regions, the greater the tendency toward clustering.

**Output Per Man, Large Manufacturing Establishments,**
**By Region, By Industry Group, 1967**
**(P1000 per man, Current prices)**

| ISIC Code | Industry Group | I Ilocos | II Cagayan | II Central Luzon | IV Southern Tagalog | V Bicol | VI Western Visayas | VII Central Visayas | VIII Eastern Visayas | IX Western Mindanao | X Northern Mindanao | XI Southern Mindanao | Industry Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Food, manufactured | 33.95 | 46.96 | 42.03 | 55.13 | 34.33 | 40.74 | 45.81 | 31.53 | 21.49 | 24.52 | 32.47 | 44.50 |
| 21 | Beverages | 31.58 | 27.49 | 35.08 | 53.03 | 30.47 | 32.28 | 37.77 | 33.31 | 22.52 | 38.28 | 41.54 | 46.48 |
| 22 | Tobacco | 32.67 | 4.56 | 46.44 | 49.26 | 15.76 | — | — | — | — | — | — | 45.50 |
| 23 | Textiles | 9.38 | — | 15.79 | 17.28 | 6.87 | 9.61 | 14.45 | 1.70 | 3.01 | 2.67 | 5.67 | 16.65 |
| 24 | Footwear, other wearing apparel | 6.98 | 3.41 | 6.78 | 9.89 | 6.00 | 5.39 | 6.08 | 5.95 | — | — | 2.09 | 9.57 |
| 25 | Wood and cork products | 15.86 | 11.98 | 32.33 | 16.46 | 19.49 | 9.01 | 12.98 | 7.20 | 15.26 | 15.30 | 16.69 | 15.74 |
| 26 | Furniture and fixtures | 8.61 | — | 5.87 | 10.54 | 7.44 | 11.46 | 8.66 | — | 5.41 | 9.22 | 6.61 | 9.69 |
| 27 | Paper, paper products | — | — | 34.17 | 47.17 | — | 8.16 | 40.30 | — | 3.35 | — | — | 44.74 |
| 28 | Printing | 11.50 | 8.74 | 11.79 | 18.72 | 6.34 | 5.30 | 9.04 | — | 5.18 | 5.84 | 7.19 | 17.40 |
| 29 | Leather, leather products | 14.10 | — | 23.93 | 20.04 | — | — | 5.67 | — | — | — | — | 24.88 |
| 30 | Rubber products | — | — | 15.88 | 35.73 | 4.47 | 10.29 | 18.57 | — | 6.16 | 13.00 | 29.08 | 33.00 |
| 31 | Chemicals, chemical products | 19.20 | 23.93 | 37.45 | 34.97 | 24.20 | 26.84 | 27.94 | — | 17.13 | 16.18 | 20.55 | 33.45 |
| 32 | Products of petroleum and coal | — | — | 807.81 | 530.32 | — | — | — | — | — | — | — | 620.37 |
| 33 | Non-metallic substances | 16.20 | 4.67 | 22.03 | 39.35 | 11.33 | 10.58 | 19.07 | — | 4.90 | 9.14 | 4.88 | 30.69 |
| 34 | Basic metals | 7.09 | — | 23.22 | 56.55 | 7.06 | 15.91 | 9.39 | — | 3.24 | 26.28 | 4.40 | 47.67 |
| 35 | Metal products | 17.21 | 10.15 | 18.58 | 22.80 | — | 5.87 | 23.74 | — | 5.23 | — | 15.42 | 22.40 |
| 36 | Machinery, except electrical | — | — | 15.04 | 18.58 | — | 14.25 | 5.08 | — | — | 7.23 | 6.51 | 16.98 |
| 37 | Electrical machinery, appliances | 2.13 | — | 28.18 | 40.26 | 7.84 | — | 13.41 | — | — | — | — | 38.20 |
| 38 | Transport equipment | 9.97 | 6.64 | 8.84 | 54.54 | 5.85 | 7.73 | 14.70 | 5.30 | 4.68 | 5.61 | 8.35 | 41.73 |
| 39 | Miscellaneous | | | | | | | | | | | | |
| | Manufacturing Output per Man | 24.69 | 21.55 | 32.19 | 33.60 | 20.22 | 32.57 | 27.48 | 21.25 | 13.53 | 18.75 | 19.03 | 30.55 |
| | Capital per man | 11.32 | 9.02 | 24.10 | 21.55 | 8.35 | 12.96 | 16.24 | 13.44 | 6.57 | 12.68 | 14.26 | 19.25 |
| | Number of Large Establishments | 112 | 87 | 332 | 2,367 | 141 | 249 | 314 | 55 | 48 | 145 | 165 | 4,015 |

# TABLE 10

## Coefficients of Variation From Tables 1 and 9
## (Per Cent)

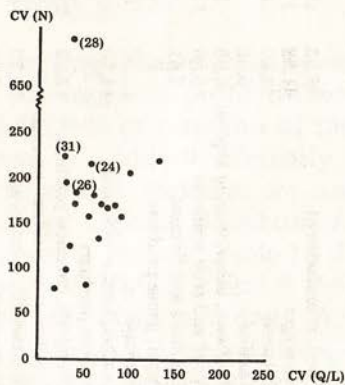| ISIC Code | Regional Industry Number of Large Establishments | Regional Output per Man |
|---|---|---|
| 20 | 115.15 | 25.33 |
| 21 | 98.42 | 21.92 |
| 22 | 121.07 | 58.20 |
| 23 | 167.92 | 37.20 |
| 24 | 216.16 | 45.62 |
| 25 | 84.92 | 41.23 |
| 26 | 191.83 | 21.98 |
| 27 | 164.15 | 66.09 |
| 28 | 680.87 | 44.26 |
| 29 | 75.18 | 48.53 |
| 30 | 164.71 | 61.36 |
| 31 | 224.81 | 27.34 |
| 32 | 80.00 | 16.39 |
| 33 | 164.92 | 71.51 |
| 34 | 201.94 | 93.79 |
| 35 | 179.76 | 36.85 |
| 36 | 154.82 | 49.70 |
| 37 | 152.50 | 76.04 |
| 38 | 210.29 | 114.08 |



Figure 3

Scatter Diagram for Table 12

The scatter diagram for Table 10, shown in Figure 3, definitely indicates positive relationship between concentration and interregional profit differentials. The significance of the coefficient of the regression line would, however, be adversely affected by four untypical observations (those for Footwear and Other Wearing Apparel (24), Furniture and Fixtures (26), Printing (28), and Chemicals and Chemical Products (31). While these industries have very low profit spread, their measures of concentration are very high, particularly for Printing (28). With the exception of Chemicals and Chemical Products (31), a capital-intensive industry, the three industries are known to be highly labor-intensive with a fairly uniform labor-intensity. As shown in Table 1, however, these industries are considerably concentrated in Region IV, which is unusual by virtue of these industries' high labor-intensity.

With respect to Chemical and Chemical Products, it is not unusual for this industry to exhibit high concentration. Virtually all large capital-intensive drug and chemical manufacturing firms are known to be located in Region IV's Metropolitan Manila area. The few firms located in other regions are small and are perhaps largely marketing distribution outlets, performing no major manufacturing activity. Consequently, the accuracy of this industry's regional output per man and the very low coefficient of variation that it yields are doubtful.

For these reasons, these four industries are not included in the regression. With these four observations set aside, we then have seven observations to which a regression line is fitted. The regression results are shown below:

(1)   $C^* = 78.96 + 1.1627 P^*$

$$(0.3114)$$

$$R^2 = 0.5175$$

(2)   $\text{Log } C^* = 1.42 + 0.4210 \text{ Log } P^*$

$$(0.1284)$$

$$R^2 = 0.4527$$

Both forms show highly significant positive coefficients (at 1.0 per cent level). The simple linear form, however, has a much better fit

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than the logarithmic form. In any case, the highly significant po[sitive] coefficients indicate strong empirical support for our second the[o]retical relationship.

## Productivity Differential in Manufacturing Across Regions

We now attempt an empirical explanation of the produc[tivity] differential in the manufacturing industry across regions as resul[ting] from the non-uniform spatial distribution of firms of different si[ze] *or* capital intensities.

It is not denied that other factors among which and, in partic[ular] industrial concentration which has direct relevance in locatio[nal] analysis, would influence productivity. Insofar as certain form[s of] economies (diseconomies) of scale may be present in agglomera[tion] clustering would have something to do with productivity. Thus, w[ith] identical production functions, firms in different locations wo[uld] exhibit different productivities as measured by output per man, w[ith] firms experiencing agglomeration economies having relatively hi[gh] productivity. To the extent that agglomeration economies do con[fer] advantages on certain locations, the role of these forces in [the] explanation of productivity differential in an industry, across reg[ions] is, however, captured by profits through their effects on cos[ts] depicted by the scheme in Figure 1. That is, the locational influ[ence] of agglomeration economies are registered indirectly through pr[ofit] insofar as they constitute cost-depressant or profit-enhancing fac[tors.] The role of agglomeration economies in interregional produc[tivity] differential is therefore to enhance the productivity of region[s by] enhancing their profit levels which, by virtue of the relation[ship] between profits and capital, would serve to attract relatively mo[re of] the capital-intensive (large) firms. In the final analysis, there[fore,] quite apart from the reinforcement of productivity differenti[al by] the economies of clustering, *the* explanation of productivity di[ffer]ential across regions must be sought in differences in factor pr[opor]tions across regions in the industry. Interregional factor-propor[tion] differential, in turn, would find explanation in the non-uni[form] distribution of "large" and "small" firms, that is, firms of dif[ferent] capital-intensities, over space. In other words, productivity di[ffer]ential in the manufacturing industry across regions, would ulti[mately] be the result of the non-uniform spatial distribution of fir[ms of] different sizes. Our empirical task, therefore, is to see whether [avail]able data would support this. We wish to find a relationship — w[hich] we expect to be positive — between regional productivity, c[apital] intensity, and concentration levels of the country's manufac[turing] establishments.

In the absence of data on output per man and capital per man for small establishments (those employing less than 10 workers), we use the data for large establishments (those employing at least 10 workers) shown in Table 9. With the eleven observations provided by Table 9, the (OLS) regressions of capital per man weighted by the proportion of the number of establishments in the region to the country's total number of establishments (Z), on regional output, per man (Q/L), are:

(1)   $(Q/L) = 22.31 + 1.03 Z$

$$(0.48)$$

$$R^2 = 0.333$$

(2)   $Log (Q/L) = 1.41 + 0.17 Log Z$

$$(0.04)$$

$$R^2 = 0.650$$

Both the simple linear form (1) and the logarithmic form (2) show highly significant positive coefficients, the logarithmic form giving better result.

## Development Policy Implications

The major conclusion from the findings bearing significantly on regional development policy is that agglomeration in manufacturing industries is very marked in the Philippines, more so for large firms than small ones. Our empirical investigations show that all indicators (number of establishments, profit levels, employment size, fixed assets of large manufacturing establishments) point to Region IV as the primary focus of industrial concentration. The high labor productivity that this region exhibits is apparently due to its high capital labor ratio which, in turn, is attributable to the concentration of large capital-intensive firms in the region.

While profit differentials are a significant determinant of the agglomeration tendency that is observed, the study does not delve into the causes of these differentials. The high profit and production in manufacturing exhibited by the cluster points (particularly Region IV), however, indicates several factors. On the demand side, the high income population of Region IV's Metropolitan Manila area,

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with tastes and preferences for industrial consumer goods is a stro
locational inducement. On the supply (cost) side, apart from superi
capital-intensity in firms located at this agglomeration point, hi
labor productivity is clearly associated with access to exter
economies at the agglomeration point. A list of significant exter
economies with positive production effects would include: (1) t
presence of a sophisticated water and land transport network
transport facilities, (2) an assured supply of skilled labor which te
to follow the location of large capital-intensive firms, (3) availabili
of adequate energy and power supply, (4) availability of large
sophisticated financial institutions, (5) availability of a sophistic
communications system and facilities. In short, economic in
structure and the ready availability of skilled labor are signifi
cost-reducing factors on the supply, factors which are barely pr
in lagging regions.

These profit-enhancing sources of external economies in
region are inextricably related with the regional pattern of pu
expenditures on social overhead capital, particularly its infrastru
component, that favors the region of agglomeration. The parti
focal point of the country's industrial activity is Metropolitan M
and Rizal in Region IV. Taken as a single geographic area, M
politan Manila and Rizal alone account for 19.6 per cent and
per cent of the country's totals for small and large manufactu
plants respectively, while Region IV as a whole has 31.5 per cen
59.0 per cent of these totals, respectively. In terms of employ
Table 11 shows Region IV to account for 31.6 per cent and 64.
cent of the country's totals for small and large manufacturing
lishments, respectively. Moreover, as shown in Table 11, all bu
component industries of manufacturing (Wood and Cork
Leather and Leather Products) in this region have the highest sh
the country's totals for the respective component industries.

That the profit-enhancing sources of external economies in R
IV is due to the concentration in it of public expenditures on
overhead capital, particularly its infrastructure compone
apparent from Table 12. Table 12 shows that a disproportio
large share of government expenditures on infrastructu
directed to Region IV in recent periods (irrigation is not relev
the Metropolitan Manila and Rizal area). Table 13 shows Reg
to have the largest net positive migration, an important fac
providing an assured labor supply. It is significant to observ
Table 14 that literacy in this region is the highest in the co
suggesting that at least the education component of the no

| ISIC Code | Industry Group | I Ilocos | II Cagayan | III Central Luzon | IV Southern Tagalog | V Bicol | VI Western Visayas | VII Central Visayas | VIII Eastern Visayas | IX Western Mindanao | X Northern Mindanao | XI Southern Mindanao | Industry Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Food, manufactured | 1.4 | 3.9 | 7.4 | 40.2 | 1.6 | 21.1 | 6.4 | 1.0 | 0.3 | 13.0 | 3.7 | 18.8 |
| 21 | Beverages | 4.9 | 1.9 | 4.9 | 64.1 | 2.0 | 4.8 | 6.5 | 3.5 | 0.7 | 1.6 | 5.1 | 5.0 |
| 22 | Tobacco | 0.5 | 8.0 | 1.4 | 89.9 | 0.2 | – | – | – | – | – | – | 5.3 |
| 23 | Textiles | 1.0 | – | 7.7 | 86.8 | 0.8 | 0.7 | 0.6 | – | – | – | 2.4 | 10.2 |
| 24 | Footwear, other wearing apparel | 0.1 | 0.2 | 3.2 | 92.5 | 0.6 | 0.8 | 1.3 | 0.2 | 0.2 | 0.5 | 0.4 | 11.2 |
| 25 | Wood and cork products | 1.2 | 8.4 | 3.2 | 17.5 | 2.0 | 4.4 | 2.3 | 1.7 | 3.8 | 27.3 | 28.2 | 14.1 |
| 26 | Furniture and fixtures | 1.4 | – | 4.9 | 70.5 | 0.1 | 2.8 | 11.7 | 0.2 | 5.7 | 0.6 | 2.1 | 1.6 |
| 27 | Paper, paper products | – | – | 11.1 | 78.4 | – | 0.5 | 9.7 | – | 0.3 | – | – | 1.7 |
| 28 | Printing | 1.0 | 0.5 | 1.4 | 87.4 | 0.6 | 2.1 | 4.3 | – | 0.4 | 0.3 | 2.0 | 2.7 |
| 29 | Leather, leather products | 1.8 | – | 65.0 | 32.1 | – | – | 1.1 | – | – | – | – | 0.3 |
| 30 | Rubber products | 0.4 | – | 3.8 | 84.2 | 0.3 | 0.1 | 2.4 | – | 3.5 | 0.3 | 5.4 | 1.7 |
| 31 | Chemicals, chemical products | 0.4 | 0.2 | 6.3 | 78.1 | 0.9 | 1.9 | 8.0 | – | 0.4 | 3.6 | 0.2 | 6.0 |
| 32 | Products of petroleum and coal | – | – | 17.6 | 82.4 | – | – | – | – | – | – | – | 0.3 |
| 33 | Non-metallic substances | 2.1 | 0.1 | 28.8 | 55.3 | 0.2 | 2.1 | 9.7 | – | 0.1 | 1.4 | 0.2 | 5.6 |
| 34 | Basic metals | 0.2 | – | 7.0 | 77.6 | 6.3 | 1.5 | 1.6 | – | 0.6 | 4.9 | 0.3 | 1.4 |
| 35 | Metal products | 0.3 | 0.1 | 6.1 | 88.0 | – | 0.4 | 3.9 | – | – | – | 1.2 | 4.9 |
| 36 | Machinery, except electrical | – | – | 14.2 | 72.9 | – | 7.1 | 2.5 | – | 0.4 | 1.4 | 1.5 | 1.5 |
| 37 | Electrical machinery, appliances | 0.2 | – | 2.2 | 92.1 | 4.5 | – | 1.0 | – | – | – | – | 2.3 |
| 38 | Transport equipment | 0.5 | 0.1 | 10.5 | 70.8 | 0.4 | 4.1 | 10.7 | 0.1 | 0.2 | 0.3 | 1.5 | 3.7 |
| 39 | Miscellaneous | – | – | 10.3 | 84.5 | 1.1 | 2.0 | 2.0 | – | – | – | 0.1 | 1.7 |
| | Total, By Region Large Establishments | 1.1 | 2.5 | 7.1 | 64.3 | 1.2 | 5.6 | 4.3 | 0.6 | 0.9 | 6.8 | 5.6 | 100.0 |
| | Total, By Region Small Establishments | 8.6 | 3.1 | 11.1 | 31.6 | 5.2 | 10.8 | 8.2 | 3.8 | 3.5 | 5.8 | 8.3 | 100.0 |
| | Small, By Region Small and Large Establishments | 2.9 | 2.6 | 8.1 | 56.5 | 2.1 | 6.9 | 5.2 | 1.4 | 1.5 | 6.6 | 6.2 | 100.0 |

Sources of basic data: National Economic and Development Authority, Manila

Note: Figures include revisions by the National Census and Statistics Office, Manila, in July 1975. Employment includes unpaid owners and family workers, production and related workers, other workers and employees.

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structure component of social overhead capital is also tilted tow[ard]
Region IV. At the opposite extreme, data referred to in this stu[dy]
show that Region IX, Western Mindanao, has the lowest values for
development indicators (output per man, capital per man in man[u]-
facturing, number of large establishments, share in governmen[t]
total expenditures on infrastructure, etc.).

This study enables us to identify progressive and lagging region[s]
the industrialization process, and it offers a spatial perspective [on]
national development. What emerges from the preceding discus[sion]
is the need for re-orientation of industrial promotion policy in [the]
country to accelerate and integrate regional growth and developm[ent]
within the framework of a market economy, and this will necessa[rily]
involve scrutiny of many specific policies. A few direct and obv[ious]
policy implications of the discussions in this section are:

(1) The regional pattern of government expenditures on so[cial]
overhead capital should be designed to favor lagging region[s]

TABLE 12

Distribution of Government Expenditures on Infrastructure,
By Major Category, By Region
(Percent)

| Region | River Control and Drainage | National and Muni-cipal Seaports | National and Communal Irrigation | Highways and Bridges | Tota[l] (by Reg[ion] |
|---|---|---|---|---|---|
| | (1964-72) | (1966-72) | (1965-72) | (1967-72) | |
| I. Ilocos | 7.1 | 4.5 | 1.5 | 5.0 | 4.[ ] |
| II. Cagayan | 1.8 | 0.1 | 3.0 | 7.0 | 5.[ ] |
| III. Central Luzon | 33.1 | 3.3 | 80.5 | 11.9 | 30.[ ] |
| IV. Southern Tagalog | 20.1 | 38.7 | 2.1 | 19.4 | 16.[ ] |
| V. Bicol | 6.1 | 12.5 | 1.3 | 8.6 | 6.[ ] |
| VI. Western Visayas | 7.1 | 2.3 | 4.3 | 6.7 | 5.[ ] |
| VII. Central Visayas | 5.3 | 11.2 | 0.1 | 5.8 | 4.[ ] |
| VIII. Eastern Visayas | 4.9 | 6.0 | 1.7 | 8.9 | 6.[ ] |
| IX. Western Visayas | 1.0 | 4.8 | 0.9 | 4.1 | 3.[ ] |
| X. Northern Mindanao | 8.0 | 11.8 | 0.8 | 11.9 | 8.[ ] |
| XI. Southern Mindanao | 5.6 | 4.9 | 3.8 | 10.6 | 7.[ ] |
| Total (By Category) | 1.9 | 11.9 | 28.2 | 57.9 | 100[ ] |

Source: International Labor Office (ILO), *Sharing in Development: A Program[me]
of Employment, Equity and Growth for the Philippines*, (Geneva: IL[O,]
1974), p. 196 (Table 37).

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## TABLE 13

### Inter-regional Migration & Population Growth, By Region
### 1960-70
### (thousands)

| Region | Natural Growth | Net Migration | Net Change |
|---|---|---|---|
| I. Ilocos | 787.4 | −161.2 | 626.2 |
| II. Cagayan | 394.6 | 32.3 | 426.9 |
| III. Central Luzon | 956.7 | 190.4 | 1,147.1 |
| IV. Southern Tagalog | 1,918.7 | 904.2 | 2,822.9 |
| V. Bicol | 904.9 | −300.8 | 604.1 |
| VI. Western Visayas | 965.7 | −425.6 | 540.1 |
| VII. Central Visayas | 749.7 | −239.8 | 509.9 |
| VIII. Eastern Visayas | 698.4 | −358.0 | 340.4 |
| IX. Western Mindanao | 522.6 | −4.3 | 518.3 |
| X. Northern Mindanao | 817.7 | 44.2 | 861.9 |
| XI. Southern Mindanao | 837.3 | 318.6 | 1,155.9 |

Note: Regions I and II both include the provinces of Ifugao and Kalinga-Apayao.

Figures for net migration are for both sexes.

Source: National Economic and Development Authority, Manila, *Statistical Yearbook of the Philippines, 1975*, p. 57.

economic linkages and complementarities between these and the growth points.

(ii) Selection of a small number of potential growth centers as key for industrial leadership and interaction with the agricultural

(iii) Complementing this dispersion emphasis should be a policy at guiding the pattern of interregional migration. Many alternative policies have been proposed to influence migration into patterns more consistent with balanced regional development and the

# TABLE 14

### Literacy of Population 10 Years Old and Over, Both Sexes
### By Region, 1960 and 1970
### (Percent)

| Region | 1960 | 1970 |
|--------|------|------|
| I. Ilocos | 71.5 | 83.1 |
| II. Cagayan | 71.6 | 78.8 |
| III. Central Luzon | 80.9 | 90.3 |
| IV. Southern Tagalog | 84.0 | 92.2 |
| V. Bicol | 75.7 | 86.4 |
| VI. Western Visayas | 70.0 | 82.1 |
| VII. Central Visayas | 62.8 | 77.8 |
| VIII. Eastern Visayas | 65.3 | 77.6 |
| IX. Western Mindanao | 47.9 | 65.4 |
| X. Northern Mindanao | 73.4 | 79.9 |
| XI. Southern Mindanao | 59.3 | 75.5 |

Note: Region I includes the provinces of Ifugao and
Kalinga-Apayao for 1960 only.

Source: National Economic and Development Authority,
Manila, *Statistical Yearbook of the Philippines,
1975,* p. 57.

avoidance of urban unemployment.[5] Policy tools such as local
incentive wage payments aimed at decreasing interlocational
differential, or outright elimination of interregional minimum
differential, and many others might be explored when a bal
regional development program is adopted.

Policies specifically aimed at private locational decisions to aid
market in bringing about industrial dispersion may be approp
once a regional expenditure program has been adopted. Exam
are:

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[5] Pan A. Yotopoulos and Jeffrey B. Bugent, *Economics of Develop
Empirical Investigations,* (New York: Harper & Row Co., 1976), Chapter 1
223-235.

(4) To the extent that profit differential across locations affects locational decisions, tax rate differential (or, conversely, subsidy rate differential) that varies positively with locational profits to decrease interlocational profit differential may be desirable;

(5) Monetary policy may be useful in employing concessionary interest rates on loans to firms contemplating new locations.

While these policies largely impinge on the industrial sector, the agricultural sector should not be neglected. The autarchic feature of regional economies may be gradually overcome if public policy is effective in promoting urban industrial-rural agricultural linkages. Industrial development in the regions where the key growth centers are geographically located should stress linkages to agriculture both in supplying intermediate goods to industry and modern inputs to agriculture. This focus will maximize the positive feedback on the agricultural sector.

To sum up, the high concentration of Philippine industry at one major growth point calls for public policy to assist the market in greater industrial diversification and linkages to agriculture. In the context of regional development within a national development program, emphasis on greater interregional connnectivity is needed in the Philippines for two reasons:

(1) To overcome the continuing autarchic feature of the Philippines' regional economies and to enhance industrial-spatial complementarities; and

(2) To raise the productivity and income levels of lagging regions.