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Regional Economic Growth and Convergence in the Philippines: 1975-1997

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Regional Economic Growth and Convergence in the Philippines: 1975-1997

Rosario G. Manasan and *Ruben G. Mercado*

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REGIONAL ECONOMIC GROWTH AND CONVERGENCE IN THE PHILIPPINES: 1975-1997

Rosario G. Manasan
Ruben G. Mercado

May 1999

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REGIONAL ECONOMIC GROWTH AND CONVERGENCE IN THE PHILIPPINES: 1975-1997

Rosario G. Manasan and Ruben G. Mercado

1. INTRODUCTION

Regional development in the Philippines has been viewed as both a goal and a strategy for national development. Taken as a goal, regional development refers to the narrowing or minimization of regional socio-economic disparities. Note that regional economic performance as measured by per capita Gross Regional Domestic Product (GRDP) is closely associated with broader measures of development and social well-being like the Human Development Index (HDI), its components and poverty incidence. Correlation analysis reveals a high positive relationship between per capita GRDP and the functional literacy rate in 1988 and 1997. In like manner, a strong inverse relationship is evident between per capita GRDP, on the one hand, and infant mortality rate, and poverty incidence, on the other hand (**Table 1**). However, Balisacan (1998) shows that interregional inequality accounts for only about 20 percent of national inequality.

As a strategy, regional development is viewed as a means to enhance overall development of the economy. It is anchored on the premise that sustainable economic development can be achieved by enhancing the status of a region in balance with the development levels of other regions relative to their respective growth potentials (Lawas, 1990). This is accomplished by providing all regions, on the basis of their comparative advantages, with opportunities to enhance their contribution to equitable growth and to widen the access of the population to productive resources, social services and physical facilities that would enable them to exploit and benefit from emerging economic opportunities (NEDA, 1993).

It has been argued that greater inequality may give rise to a breakdown in the social fabric and may weaken social cohesiveness. This situation may increase crime and security of property rights, thus, reducing incentives for savings and investments. In turn, low savings and investments lead to lower growth (Nugent 1998). Moreover, Persson and Tabellini (1994) have found that higher initial levels of inequality tend to produce lower income growth rates.

Regional development has been a major policy thrust since the sixties as articulated in the 1963 Integrated Socio-Economic Plan and reinforced by the 1967 Industrial Incentives Act (Lamberte, et. al, 1993). The institutional framework for regional development was established through the creation of twelve administrative regions in 1972 through Presidential Decree No. 1 or the Integrated Reorganization Plan. Since then, the principle of regional development as both a means and a goal for national development has been in the policy framework of subsequent government regimes. The focus and strategies adopted have differed, though, from one medium-term plan to the next.

The 1974-1977 Plan adopted the Integrated Area Development (IAD) approach. It basically identified areas in the regions where priority development planning and infrastructure development assistance will be provided. The 1978-1982 Plan continued the previous plan with the expansion of the IAD program areas but this time focused more on the lagging regions. The 1983-1987 Plan continued the strategies of the previous plans but gave new emphasis on potentially dynamic cities, with increased infrastructure investments in Cebu, Iloilo, Bacolod, Cagayan de Oro and Davao with the end in view of encouraging industrial location in these areas. This Plan was updated to emphasize balanced agro-industrial development, promoting the development of agro-based or agriculturally linked industries. The Aquino regime's 1987-1992 Plan adopted an employment-based rural development strategy as the principal means to achieve regional balance. Though very much like the previous updated plan, the priority was given to small and medium sized cities to strengthen linkages of rural resource areas with urban areas. Regional Agro-Industrial Centers (RAICs) in each region were identified for this purpose. Strengthening regional institutions through meaningful decentralization was also a major thrust. Thus, the Regional Development Councils (RDCs) and the local governments were provided broader powers to influence public resource allocation in their respective regions. The Ramos administration, in its 1993-1998 Plan, instituted the vision of achieving a "newly industrializing economy". The strategies adopted for regional development are no different from the previous regime, more particularly, the countryside agro-industrial development strategy . However, given fiscal constraints, the Plan resolved to facilitate the development of the RAICs and regional growth networks (linking two or more RAICs) through a priority development scheme and through the encouragement of substantive private sector participation in financing infrastructure development.

Given government efforts to promote balanced regional development and spatial equity in the past 30 years, it is important to evaluate the progress that has made in this area to date. This study attempts to undertake this task in the light of the experience of the Asian NICs in closing regional disparities. In this vein, this study tries to infer whether balanced regional development can be an associated feature of NIChood or whether NIChood brings about risks in attaining regional convergence.

More specifically, the study aims to:

- Evaluate the economic growth and development in the country's fourteen regions and to determine whether there has been progress in narrowing regional disparities;

- Relative to (a), develop summary measures or indicators to monitor achievements in reducing regional disparities; and

- Assess whether government policies have succeeded in inducing regional convergence or have further widened regional disparities.

- Suggest a road map towards regional development while pursuing the NIChood path.

2. OVERVIEW OF REGIONAL ECONOMIC DEVELOPMENT

Table 2 presents indices of per capita of gross regional domestic product (GRDP) from 1975 to 1997.[1] It shows the National Capital Region (NCR) persistently dominating all other regions with a per capita GRDP that is consistently more than twice as high as the national average. However, the NCR lost considerable ground between 1975 and 1997 as its per capita GRDP index declined from 255 in 1975 to 219 in 1986 to 220 in 1997. Moreover, while NCR's per capita GRDP was 2.1 times that of the second richest region (Southern Tagalog) and 5.6 times that of the poorest region (Bicol) in 1975, its per capita GRDP was 1.8 times that of second richest region (Cordillera or CAR) and 4.8 times that of the poorest region (Bicol) in 1997. This came about as the NCR's per capita GRDP declined by 0.2 percent yearly on the average in real terms between 1975 and 1997.

This development is more the result of the high rate of population growth in the NCR rather than to that of poor economic performance per se. The average rate of growth of GRDP in the NCR in 1975-1997 was slightly higher than the national average (**Table 3**). Consequently, NCR's contribution to national GDP was fairly stable at around 30 percent during the period (**Table 4**). In contrast, NCR's rate of population growth was 3.3 percent, more than 30 percent higher than the national average of 2.5 percent (**Table 3**).

In Luzon, the per capita GRDP index of Southern Tagalog fell markedly from 119.2 in 1975 to 105.1 in 1997 while that of the Cordilleras (CAR) rose dramatically from 97.8 in 1987 to 120.5 in 1997. The growth of CAR's GRDP as well as its per capita GRDP was the highest in the entire country in 1987-1997 (**Table 2** and **Table 3**). In contrast, Southern Tagalog's per capita GRDP decreased by 0.1 percent yearly on the average in 1975-1997. Like the NCR, Southern Tagalog was burdened by a high rate of population increase which completely washed away the positive effects on welfare of its exemplary rate of growth in GRDP.

On the other hand, Ilocos and Central Luzon showed moderate improvements in their per capita GRDP indices, from 53.7 and 93.2 in 1975 to 56.1 and 96.6 in 1997, respectively. While the per capita GRDP index of the Bicol Region stagnated around 46 all throughout 1975-1997, that of Cagayan Valley declined from 59.1 to 56.0 (**Table 2**). In these 4 regions, the developments in their per capita GRDP indices were largely driven by the relative growth of their GRDPs.

[1] The per capita GRDP index is defined as the ratio of the regional per capita GRDP to the national average GRDP. Thus, a per capita GRDP below 100 implies that a region's per capita GRDP is below the national average while a per capita GRDP above 100 implies that a region's per capita GRDP is above the national average.

In the Visayas, Central Visayas exhibited exemplary gains in economic development, with its per capita GRDP index surging from 80.9 in 1975 to 91.1 in 1997 (**Table 2**). Central Visayas' per capita real GRDP posted the fastest rate of growth (1.1 percent yearly) amongst all regions in 1975-1997. This arose as the region enjoyed a higher than average rate of growth in real GRDP and lower than average rate of population increase (**Table 3**). Note, however, that the regional share of Central Visayas in national GDP was stable at 6.5 percent all throughout the period (**Table 4**).

In contrast, the GRDP of both Eastern Visayas and Western Visayas registered sluggish growth in real terms in 1975-1997 (**Table 3)**. Thus, despite their low rate of population increase, the per capita GRDP of Eastern Visayas and Western Visayas rose, respectively, by a low 0.1 and 0.35 percent per annum on the average, the second and fourth lowest rate of per capita regional growth during the period. Consequently, the contribution of Eastern Visayas and Western Visayas to national GDP contracted, respectively, from 3.2 percent and 8.7 percent in 1975 to 2.3 percent and 7.1 percent in 1997 (**Table** 4) even as their per capita GRDP index went down 52.3 and 88.4, respectively, to 47.6 and 85.4 (**Table 2**).

In both cases, the slump was particularly severe in 1975-1986.[2] However, while Eastern Visayas' per capita GRDP continued to stagnate in 1987-1997, that of Western Visayas recovered somewhat but not enough to regain the level of its per capita GRDP index in 1975.

In Mindanao, only Western Mindanao showed tangible gains in its per capita GRDP index between 1975 and 1997. The per capita GRDP index of Western Mindanao increased from 52.2 to 63.5. On the other hand, the per capita GRDP index of Northern Mindanao fluctuated around 77 during the period (**Table 2**).

These two regions performed creditably in terms of real GRDP growth. They registered the highest rate of growth in gross regional product amongst all the regions in 1975-1997 (**Table 3**). However, the positive effects of their high rate of GRDP growth were largely eroded by the high rate of population increase. This is especially true of Northern Mindanao.

In contrast, the per capita GRDP indices of both Southern Mindanao and Central Mindanao deteriorated in 1975-1997. The per capita GRDP index of Southern Mindanao fell from 107.2 in 1975 to 97.2 in 1997 while that of Central Mindanao slipped from 66.2 to 62.6 (**Table 2**). The mediocre performance of these two regions in terms of GRDP growth coupled with high rates of population growth largely explain the lackluster development in their per capita GRDP.

[2] In Western Visayas, the slowdown during this period followed the collapse of the sugar industry.

3. REGIONAL CONVERGENCE ANALYSIS

The previous discussion shows that marked disparities across regions still persists throughout 1975-1997. In this section, the trends in regional disparities are evaluated. Thus, the following question is posed here: did the disparities narrow (converge) or did they widen (diverge) over time? Also, what is the rate of convergence (divergence) during the period under study?

3.1 Convergence Indicators

This study adopts the classical approach to convergence analysis introduced by Sala-i-Martin (1996) to examine the dispersion of per capita incomes across a country's regions. Two convergence models are used in this study: δ-convergence and β-convergence.

A group of economies (or regions) are said to be converging in the sense of δ if the dispersion of their real per capita GDP levels tend to decrease over time. In symbols, the relationship is defined by:

$$\delta_{t+T} < \delta_t,$$

where δ_t is the time *t* standard deviation of log ($y_{i,t}$), which is the logarithm of the region's *i*'s GDP per capita at time *t*.

On the other hand, absolute β-convergence is said to exist if poor economies (regions) tend to grow faster than rich ones. Specifically, $\beta > 0$ in the following regression equation indicates absolute β-convergence:

$$\gamma_{i,t,t+T} = \alpha - \beta \log (y_{i+t}) + \varepsilon_{i,t} ,$$

where $\gamma_{i,t,t+T} \equiv \log (y_{i,t+T}/y_{i,t}) / T$, the region *i*'s annualized growth rate of GDP between *t* and *t*+T.[3]

Sala-i-Martin points out that β-convergence is a necessary but not a sufficient condition for δ-convergence. He notes that these two concepts may not always show up together because they capture two different aspects of convergence. δ-convergence relates to whether or not the cross-regional distribution of national income shrinks over time. On the other hand, β-convergence relates to the mobility of different regional economies within the given distribution of national income.

---

[3] Absolute β-convergence assumes that the only difference across regions lies in their initial levels of capital. In other words, the different regions share not only the same steady-state per capita output and the same rate of technological progress but also the same stock of governance institutions and production and organizational technologies. In contrast, conditional β-convergence may be more relevant if the regional economies do not share the same rate of technological progress and/or steady-state per capita output.

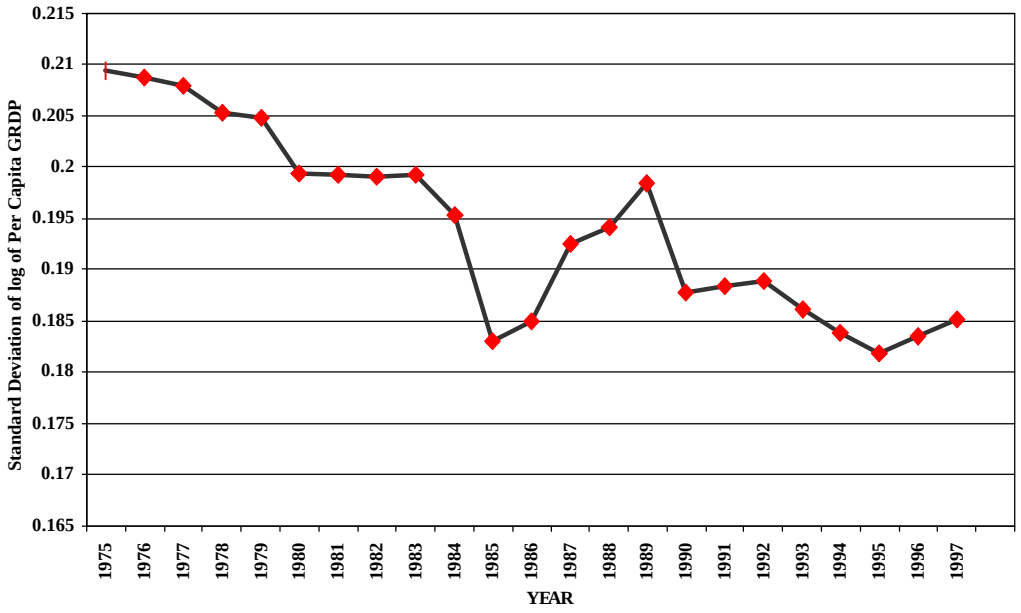
This study focuses on unconditional or absolute convergence. This approach is premised on the fact that the different regions within a country more likely share the same stock of governance institutions and production and organizational technologies as well as the same steady-state output and rate of technological progress than different countries.

3.2 Analysis of Convergence Estimates

d-*convergence.* **Figure 1** plots the dispersion of the log of GRDP per capita across the fourteen regions for the period 1975-1997. Overall, δ-convergence is evident for the entire 22-year span but variations are significant within sub-periods.

Cross-regional dispersion of per capita income fell continuously from 0.209 in 1975 to 0.183 in 1985. It then rose sharply in 1986-1989, reaching 0.198 in 1989, before dipping once again to 0.188 in 1990. From then onwards, the standard deviation of per capita GRDP generally declined gradually but with some fluctuations.

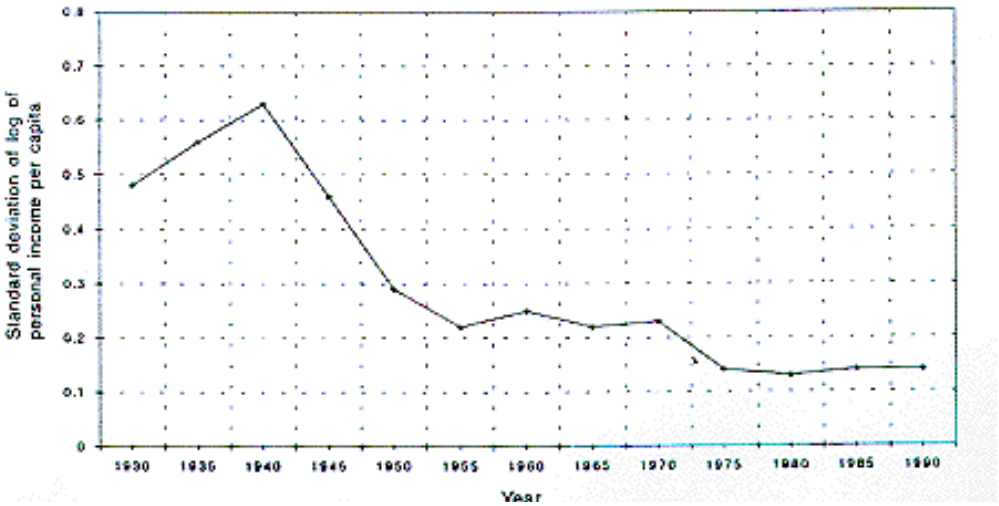
Figure 1
d-Convergence: Dispersion of Log of Per Capita GRDP, 1975-1997



The process of δ-convergence in real per capita GRDP for the Philippine regions compares favorably with those of most other Asian countries. **Figure 2** presents the most recent δ-convergence estimates available for Japan, India, China, Thailand, and Malaysia.

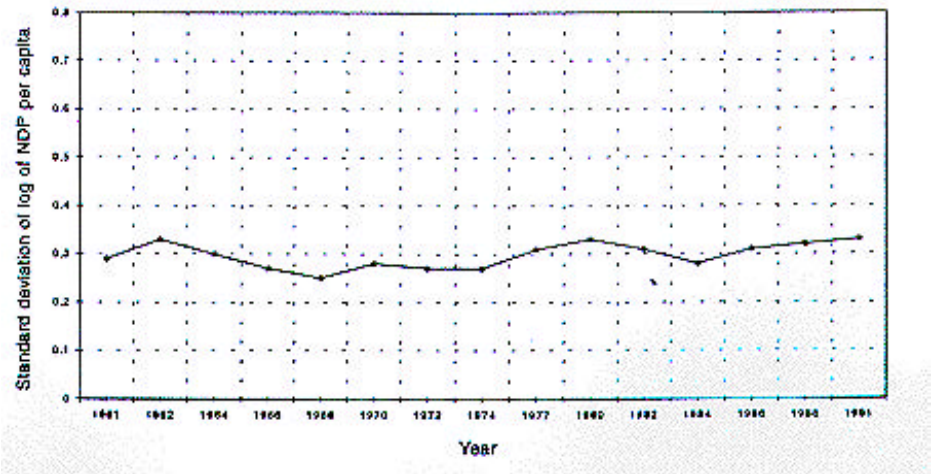
Barro and Sala-i-Martin (1993) found regional δ-convergence in Japan's 47 prefectures during the post World War II period as the standard deviation of the log of per capita personal income fell from a war-time high of 0.63 in 1940 to 0.15 in 1987 (**Figure 2.A**). In contrast, δ-divergence was observed in the regional economies of India, China, Thailand and Malaysia.

Figure 2.A Japan: dispersion of personal income per capita, 1930-90



*Source: Barro, R.J. and Sala-I-Martin, X., 1993. 'Regional growth and migration: a Japan-United States comparison', *Journal of Japanese and International Economies*, 6(December):312-46; Barro, R.J. and Sala-I-Martin, X., 1995. Economic Growth, McGraw-Hill, New York.

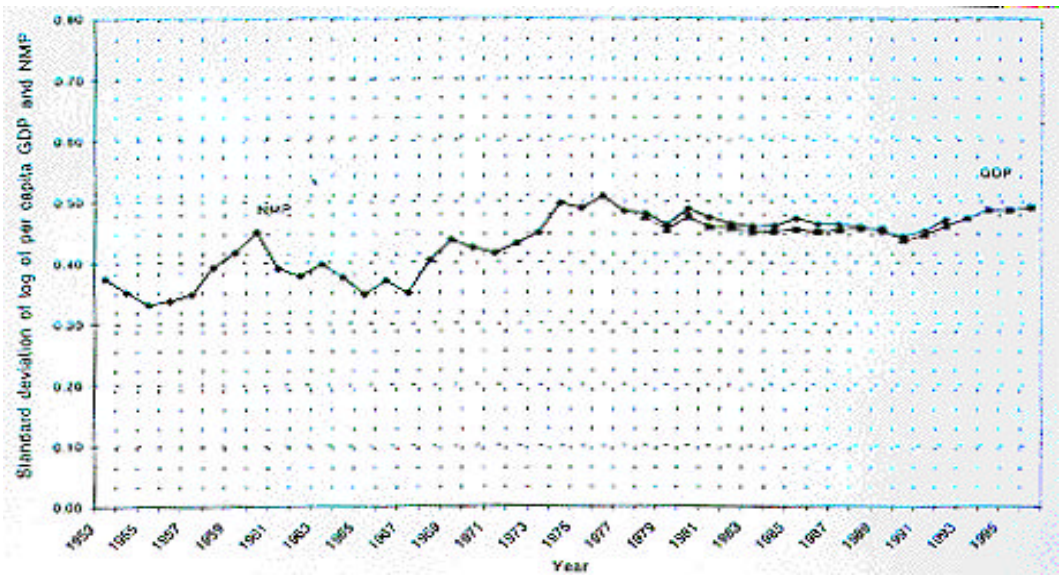
Figure 2.B India: dispersion of net domestic product per capita, 1961-91



*Source: Cashin, P. and Sahay, R., 1996. 'International migration, center-state grants and economic growth in the states of India', *IMF Staff Paper*, 43(March):123-71.

Cashin and Sahay (1996) reported δ-divergence in 25 Indian states where the standard deviation of the log of per capita net domestic product rose from 0.29 in 1961 to 0.33 in 1991 (**Figure 2.B**). Similarly, the study of Garbaccio and La Croix (1998) revealed δ-divergence in the 29 provinces of China during the period 1953-1978 (Maoist period) and δ-stagnation in 1978-1996 (reform period). During the Maoist period, the standard deviation of the log of the per capita net material product increased from 0.37 in 1953 to 0.48 in 1978. During the reform period the standard deviation of the log of the real provincial GDP per capita rose almost imperceptibly from 0.48 in 1978 to 0.49 in 1996 (**Figure 2.C**).

Figure 2.C **China: dispersion of per capita net material product and gross domestic product, 1953-96**



*Source: Garbaccio, R.F. and La Croix, S.J., 1998. Regional convergence in output and consumption in China: evidence from the Maoist and reform periods, Department of Economics, University of Hawaii, Honolulu (unpublished).

In like manner, Southichak and La Croix (1998) documented the rise of the standard deviation of the log of real per capita gross provincial product (GPP) in Thailand's 71 provinces from 0.53 in 1975 to 0.69 in 1994 (**Figure 2.D**). Likewise, the standard deviation of the log of real per capita GPP for the 12 provinces of Malaysia rose from 0.36 in 1965 to 0.35 in 1995 (La Croix 1998). See. **Figure 2.E**.

b-*convergence.* **Table 5** reports the estimated speed of convergence, β, for the Philippines as well as for other Asian countries. The estimated speed of convergence for the Philippines between 1975-1997 is considerably lower than those observed in developed countries where the estimated speed of convergence was found to cluster around 2 percent a year, i.e., β = .02.. However, unlike the experience in other developing Asian countries, the estimated β-coefficient in the Philippines is positive (indicating β-convergence) and statistically significant.

Figure 2.D Thailand: dispersion of GPP per capita, 1975-95

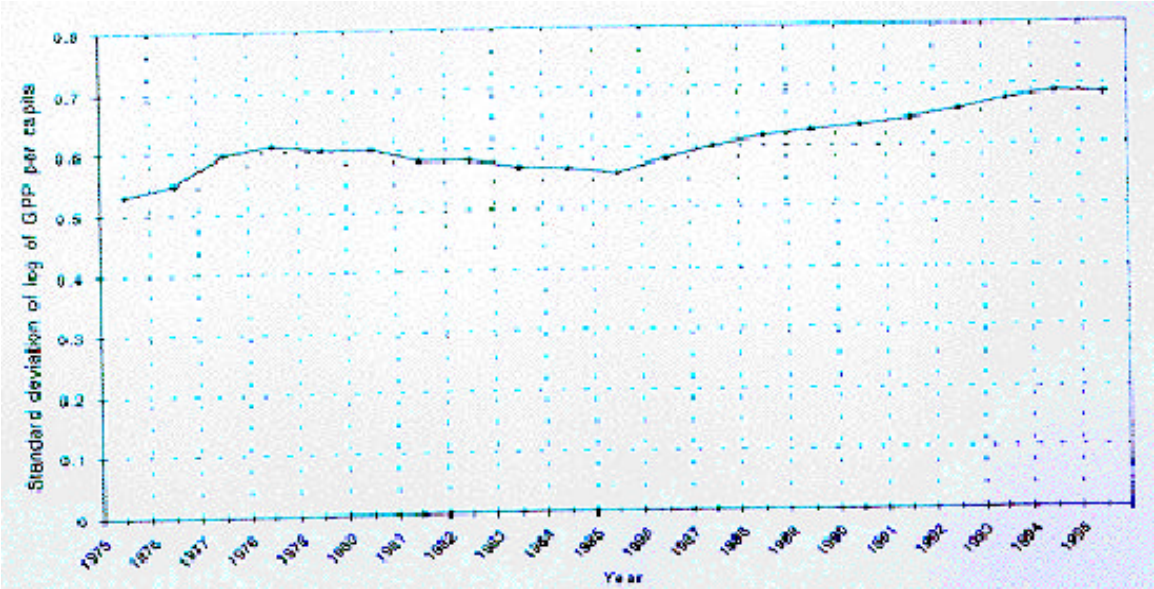
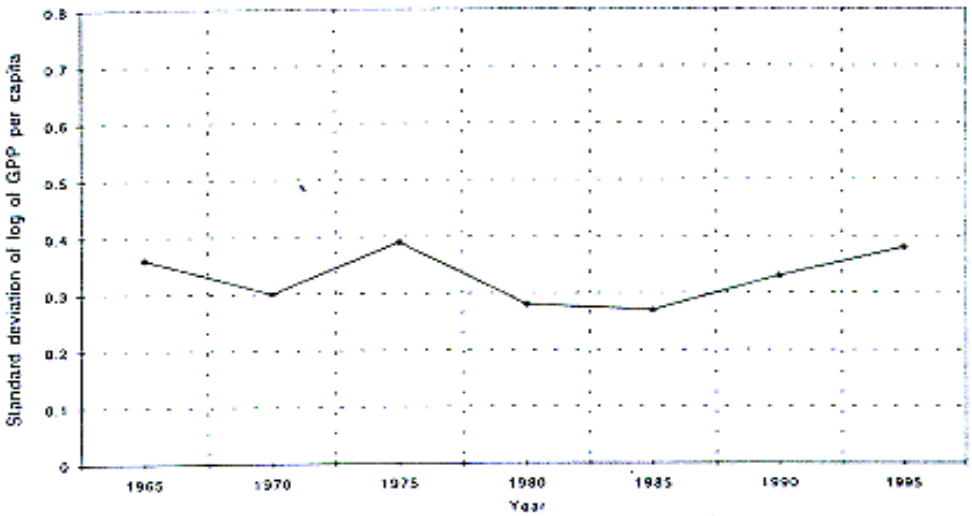


Figure 2.E Malaysia: dispersion of GPP per capita, 1965-95



*Source: La Croix, S.J., 1988. Convergence in Malaysia, University of Hawaii, Honolulu (unpublished).

*As cited by la Croix et al. (1998) in Sustainable and Balanced Development in the Asia Pacific, EDAP Joint Policy Studies 4.

Although India, Malaysia and China (in 1978-1996) all yielded positive β-coefficients, those estimates were found to be statistically insignificant. On the other hand, Thailand and China (in 1953-1978) had negative β-coefficients (La Croix, 1998).

Regressing equation (2) using Philippine data for the entire period of study (1975-1997) provides strong evidence for β-convergence. The β-coefficient was estimated to be equal to .006 and was found to be statistically different from zero at 5 percent level of significance. The coefficient of determination was estimated to be 0.42, indicating a fairly good fit.

On the other hand, dividing the period of study into two parts indicates that the speed of convergence is faster in the period 1975-1986 compared to the period 1987-1997. The β-coefficient for 1975-1986 was estimated to be 0.0147 and is statistically significant at the 10 percent level. In contrast, relatively weak and statistically insignificant β-convergence was found during the period 1987-1997, with $\beta = 0.0079$.

4. SHIFT ANALYSIS

In this section, an attempt is made to explain the differences in regional economic performance. In other words, some of the reasons why a region grows faster than others are identified. The approach used is shift analysis.

Shift analysis is a method of quantifying differences in regional growth by comparing each region's performance with the national average. Actual regional development is compared with an estimated regional growth that would have happened if the region had grown as fast as the national growth rate. The difference between the actual and the estimated GRDP of region *j*, if region *j*'s economy has grown at rate equal to the national average GRDP growth, is called the **total net shift** (TNS). If the TNS value of region *j* is positive (negative), its development is above (below) the national average.

The TNS can be divided into two components: **net differential shift** (NDS) **and net proportional shift** (NPS). NDS is the difference between actual regional performance and the development that would have occurred if the region's sectors had each grown at the same rate as the national average sectoral growth rate. Thus, if the growth of specific sectors within a region is higher (lower) than the national average, NDS values are positive (negative) and indicate that the region possesses localization advantages (disadvantages) that are favoring (hindering) the development of specific sectors.

NPS, on the other hand, is the difference between TNS and NDS and refers to the structural composition of the regional economy. High (low) NPS values indicate structural advantages (disadvantages) for a region. For instance, if the aggregate regional growth is higher than the national average growth rate (positive TNS) but the growth rate of some regional sectors are lower than the national average sectoral growth rate (negative NDS), the

fast growing sectors of the region have more impact on the regional economy (positive NPS) than on the national economy.

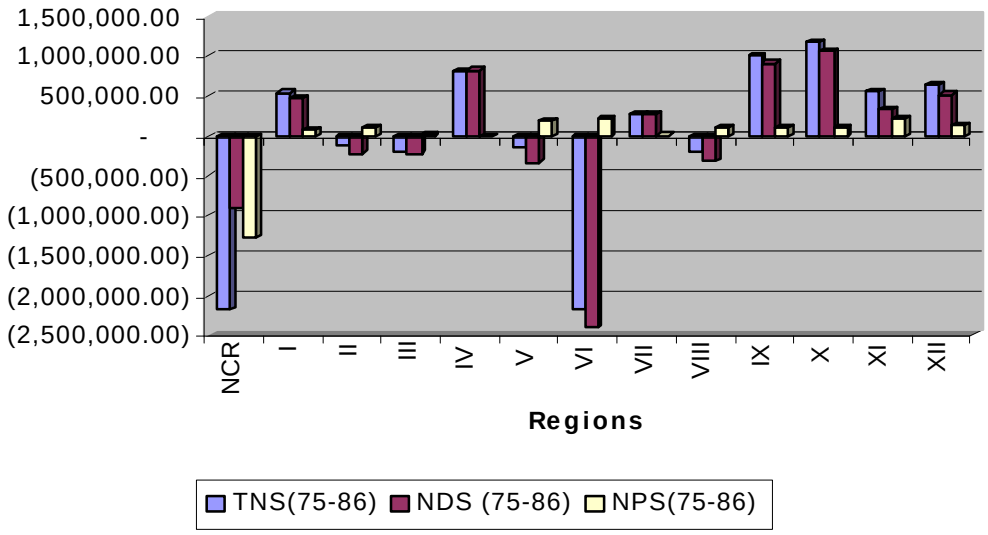
Period 1975-1986. The Philippine economy grew by 2.6 percent annually on the average in 1975-1986 (**Table 6**). The economy was growing at more than 6 percent in the period 1975-1980 but contracted by –0.28 percent in 1980-1986 primarily because of the recession in the developed countries and economic/political turmoil in the domestic front in the early eighties.

The primary sector (agriculture, fishery and forestry) registered the highest rate of growth (3.7 percent) in 1975-1986. In contrast, industry, which spurred economic growth rates in the first half of this decade, grew by only 1.8 percent annually during the entire period while the services sector increased by 2.7 percent per year.

Consequently, the structure of the economy shifted from industry to agriculture. The share of agriculture, forestry and fishery sector in GDP expanded from 24.1 percent in 1975 to 27.0 percent in 1986. Conversely, the share of the industry sector contracted from 34.7 percent to 31.7 percent while that of the services sector remained constant at 41.3 percent.

Not surprisingly, therefore, the shift analysis (**Figure 3**) showed high positive TNS and NDS values for regions that are largely dominated by the agriculture sector, specifically all the Mindanao regions and the Ilocos region (Region I). On the other hand, the positive showing of Southern Tagalog (Region IV) and Central Visayas (Region VII) may indicate the smaller impact of the economic contraction of 1983-1985 on these regions' secondary and tertiary sectors. All of these regions achieved annual rates of GRDP growth in excess of 3 percent.

FIGURE 3
Shift Analysis of Gross Regional Domestic Product (1975-1986)



The Ilocos region possessed localization advantages in the agriculture sector, as indicated by the high NDS value for the region during the period. This region largely benefited from the high 5.9 percent yearly growth in its agriculture sector (spurred by crop, livestock and poultry production). The share of agriculture in GRDP in the region increased from 33.3 percent in 1975 to 41.6 percent in 1986 (**Table 7**). The region also exhibited some localization advantage in its industry sector which grew by a notable 2.9 percent during the period compared with the national average of 1.8 percent (**Table 6**).

All of the Mindanao regions experienced overall GRDP growth rates well above the national average. Moreover, GRDP growth in these regions was led by the agriculture sector.

Northern Mindanao's (Region X) GRDP growth rate of 5.1 percent came about because of its better than average performance in all three sectors, especially in agriculture (**Table 6**). Its above-average agricultural rate of growth of 6.1 percent per year led to the expansion of the share of its agriculture share in GRDP from 38.4 percent in 1975 to 42.8 in 1986 (**Table 7**). In like manner, the outstanding performance of its industrial sector, particularly in the period 1975-1980, increased the contribution of the said sector in GRDP from 20.1 percent in 1975 to 21.3 percent in 1986. In the region, the agriculture sector was dominated by crop production while the industrial sector was led by mining, quarrying and construction.

In 1975-1986, developments in Central Mindanao (Region XII) closely mirrors those in Northern Mindanao. Both the agriculture and industry sectors led the growth during this period, resulting in a larger contribution of said sectors in GRDP.

Similarly, Western Mindanao (Region IX) possessed high TNS and NDS values because of the strong growth in its agriculture sector (8.7 percent per year) and industry sector (3.2 percent). The region experienced a structural shift toward agriculture (46.2 percent of GRDP in 1975 to 61.6 percent of GRDP in 1986). High NDS values indicate localization advantages in the agriculture sector, particularly crop production and fisheries.

Southern Tagalog (Region IV) grew at a rate above the national average because of the strong growth of its services sector. Moreover, its industry sector posted a creditable rate of growth despite the economic crisis of 1983-1985. High NDS values indicated regional localization advantages for the industry and services sectors.

Like Southern Tagalog, the relatively high NDS values for Central Visayas (Region VII) suggests that it possessed localization advantages in both the industrial and services sectors. The low NPS value resulted from its structural disadvantage during the period 1975-1980 due to the relatively low share of the industry sector which was its fastest growing sector.

The analysis showed that NCR and Cagayan Valley (Regions II), Central Luzon (Region III), the Bicol region (Region V), Western Visayas (Region VI) and Eastern Visayas (Region VIII) performed sluggishly in 1975-1986. Regions II, V, VI and VIII (all with negative TNS and NDS values) possessed positive NPS values indicating that these regions

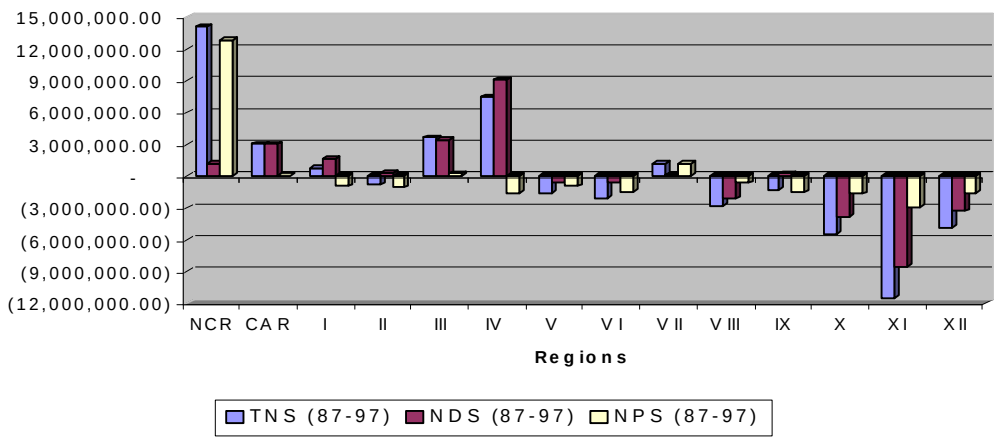
have structural advantages in the primary sector. However, their agriculture sectors failed to perform as well as the national average. On the other hand, the National Capital Region (NCR) with its primarily industrial base was the worst hit by the 1983-1985 recession.

Period 1987-1997. The period 1987-1997 witnessed the slowdown of the agriculture sector but a recovery in the industrial and service sectors. The economy grew by 3.8 percent annually on the average compared to 1.8 percent in the previous decade. The industry and services sectors grew by 4.2 and 4.4 percent per year, respectively, while the primary sector rose by a mere 2.1 percent.

As a result of these developments, the economy's structure became increasingly oriented towards the industrial and service sectors. The share of agriculture, fishery and forestry sector to GRDP declined from 24.4 percent in 1987 to 20.7 percent in 1997. In contrast, the share of the industry sector and the services sector rose from 34.6 percent and 41.0 percent, respectively, to 35.9 percent and 43.4 percent (**Table 7**).

In contrast to the previous decade, the shift from agriculture to the industry and service sectors adversely affected the economic development of the largely agricultural regions. The slowdown in the agricultural sector was due to a mix of problems including the occurrence of major natural calamities (earthquake, volcanic eruption, El Nino) and slippages in the implementation of agricultural programs and infrastructure. Thus, during the period, shift analysis (**Figure 4**) showed slower growth compared to the national average (and, consequently, negative TNS values) in the agriculture-based regions including Regions II, V, VI, VIII, and all the Mindanao regions. Conversely, high positive TNS and NDS values were found for regions having large industrial bases including NCR, CAR, Regions I, III, IV and VII. These regions achieved annual GRDP growth rates of at least 4 percent per year during the period, outpacing the national economy.

FIGURE 4
Shift Analysis of Gross Regional Domestic Product (1987-1997)



NCR exhibited the highest positive TNS value. The regional economy grew at 4.3 percent per year in the 1987-1997 period (**Table 6**). GRDP growth was particularly high in 1992-1997 when a 5.0 percent growth rate was achieved owing to the restored power situation, mega-infrastructure development in the metropolis as well as the inflow of large private sector investments. The positive NDS value indicate localization advantage in the services sectors. High positive NPS implies a strong structural advantage of NCR in the industry and services sectors. The share of the services sector in NCR's GRDP expanded from 55.6 percent in 1987 to 58.5 percent in 1997 (**Table 7**). However, the share of the industry sector contracted from 44.4 percent in 1987 to 41.5 percent in 1997, indicating the diminishing importance of the sector.

CAR posted the highest growth in GRDP (5.5 period) during the period. It registered positive NDS as all sectors in the region grew at a more rapid pace than the national average. The industry sector and the services sector led the growth of the region during the period with a growth rate of 6.6 percent and 5.5 percent, respectively (**Table 6**). Agriculture turned in a better than average performance but grew at a relatively slower rate of 2.7 percent. The positive NPS value suggests that CAR possessed structural advantage in the industry sector. The share of industry increased from 53.4 percent in 1992 to 59.4 in 1997 (**Table 7**). This may be attributed to the impressive performance of the Baguio Export Processing Zone. The construction sector also spurred the development of the region with the rebuilding and rehabilitation of facilities damaged by the earthquake. Substantial investment inflows were also registered during the period which contributed to the region's rapid development. For instance, in 1994, investments in CAR hit an all-time high with the entry of the China Chan Yeng Energy Development Project for the rehabilitation of the Binga Dam. In 1995, a larger portion of investments in CAR was directed to mining exploration and development. This was made possible with the enactment of the new Mining Code. These investments were brought about by the vigorous marketing of the North West Luzon Growth Quadrangle (NWLGQ) of which BLIST (Baguio-La Trinidad-Itogon-Sablan and Tuba) is one of the growth areas.

Region I achieved positive TNS value benefiting from its locational advantage in industry and agriculture. The industry sector improved its share in the regional economy, particularly in 1992-1997 when its contribution to GRDP rose from 12.8 percent to 17.8 percent (**Table 7**). As in CAR, Region I's growth may partly be attributed to post-earthquake reconstruction activities. But the impressive growth performance of the region was also due to the inflow of private investments, e.g. Proton and others. In fact, in 1995, Region I posted the highest increase in DTI-assisted investments. A large percentage of the region's investments was generated mainly from the newly registered industries with the BOI which include the Digitel Telecom System, Bottle-Vital Mineral and Four Sons Enterprises, all located in Pangasinan. Investments were also heavy in food and wood products. The infrastructure development and the investment activities under the NWLGQ may have also stimulated the region's growth. The negative NPS value, however, suggests a structural disadvantage in the industry sector which starts from a very low base.

Region III's GRDP grew at an impressive rate of 4.2 percent yearly in 1987-1997. The positive NDS value resulted from the region's localization advantage in the agriculture and industry sectors. The industry sector grew by 5.0 percent yearly and the agriculture sector by 4.0 percent (**Table 6**). The positive NPS value suggests the region has a structural advantage in the industry sector. It is notable that the growth in the region's GRDP outpaced that of national GDP despite the devastation brought about by two major calamities: the 1990 earthquake and the 1991 Mt. Pinatubo eruption. The pullout of the American bases also exacted a toll on investment and employment. However, intensified industrial development and expansion were pursued for Bataan, Bulacan and Zambales owing to their locational advantage. The Subic Bay Freeport Zone (SBFZ), Clark Special Economic Zone (CSEZ) as well as the Bataan Export Processing Zone (BEPZ) have continued to attract capital investments and manufacturing activities contributing to the fast growth of the regional economy.

With the national thrust to disperse industries to areas outside Metro Manila, Region IV has been the most desired location of investors given its proximity to the national capital. Thus, the region recorded the second highest TNS value, next to NCR. The region yielded a positive NDS which indicates the region's localization advantage in the industry and services sectors. The region's GRDP grew by 4.3 percent with the industry sector expanding by 5.4 percent, the services sector by 4.3 percent and the agriculture sector by 2.8 percent (**Table 6**). The agriculture sector's share in the total regional output, thus, decreased from 29.7 in 1987 to 25.5 in 1997. Conversely, the share of the industry sector increased from 39.6 percent in 1987 to 43.8 percent 1997 (**Table 7**). The positive NPS indicate the region's has structural advantage in the industry sector. In 1992, there were already 18 industrial estates and one export processing zone in the region, each offering state-of-the art facilities conducive to business. In 1995, it posted the second highest growth in investments, second only to Region I, with more than 90 percent of the total investments going to Batangas. The CALABARZON (Cavite, Laguna, Batangas, Rizal, Quezon) area has continued to receive the greater share of investments in its industrial parks and SEZs.

Region VII's GRDP expanded at average annual rate of 4.0 percent with localization advantage in the agriculture and services sectors. The positive NPS value implies a structural advantage in the services sector. The share of services in the region's total output increased markedly from 51.1 percent in 1987 to 55.2 percent in 1997 (**Table 7**). A major contributor of the better than average performance in the services sector was the influx of tourists with the expansion of airline and hotel facilities and services.

On the other hand, the growth in the industry sector was low in the 1987-1992 (1.2 percent) due to the significant decline in the output of the manufacturing sub-sector starting in 1990 and the contracting growth rates of the mining and quarrying sub-sector. However, the industry sector recovered starting in 1993 as investments surged in the region's industrial estates such as Mactan Export Processing Zone II (MEPZ II), Naga Township, CIPDI Balamban and Cebu Light Industrial Park in Mactan.

Shift analysis showed lower than average performance in Regions II, V, VI, VIII, and all of the Mindanao regions. In all of these regions, the agriculture sector contributed 35-50 percent of the total regional economy. Consequently, the impressive growth performance of the industry sector in these regions, particularly in the period 1992-1997, failed to make a perceptible impact on the overall rate of economic growth as these regions share a structural disadvantage in the industry sector.

On the other hand, a number of natural calamities, including the El Nino in 1990 and 1997, visited the country during the period 1987-1997. These vicissitude adversely affected the performance of the agriculture sector in these regions. Thus, the agriculture sector in these regions under-performed relative to the rest of the country.

Typhoons and flashfloods caused production setbacks in Regions II and V. Region II, after showing a doubling of output between the first quarters of 1994 and 1995, experienced a dip in 1996 by as much as 57 percent because of the destruction of a huge volume of corn crops already due for harvest by flashfloods and typhoons. Region V suffered from the after effects of the super typhoon which hit the country in the latter part of 1995.

The Visayas and Mindanao regions, except Region VII, encountered severe droughts and typhoons. The 1990 drought affected the production of major crops such as palay, coconut, sugarcane, corn, banana and mango in Region VI. The December 1993 typhoon again affected agricultural production in the said region. Similarly, the dry spell in 1990 and the devastating typhoon that hit Region VIII in 1994 and 1996 resulted in the poor performance of agriculture sector in the said region during the period.

In 1995, the excessive rainfall in Region XI particularly in Sarangani province and the flashfloods in South Cotabato affected the standing crops. The problem was further aggravated by the Lake Maughan tragedy. These critical events contributed to 23 percent decline in the region's corn production. In 1994, the decline in rice and corn production in Central Visayas was reported to be largely due to flooding and rat/locust infestation.

Aside from natural disasters and calamities, there are a number of factors that hindered the growth of agriculture. These include: the low prices of palay and corn and high cost of fertilizers, difficulties in the allocation of water from multipurpose dams, unserviceable irrigation systems, lack of modern technology for the agriculture sector, particularly tractors, poor condition of farm-to-market roads and slow implementation of the Gintong Ani Program due to devolution of agriculture functions to the local government units (LGUs).

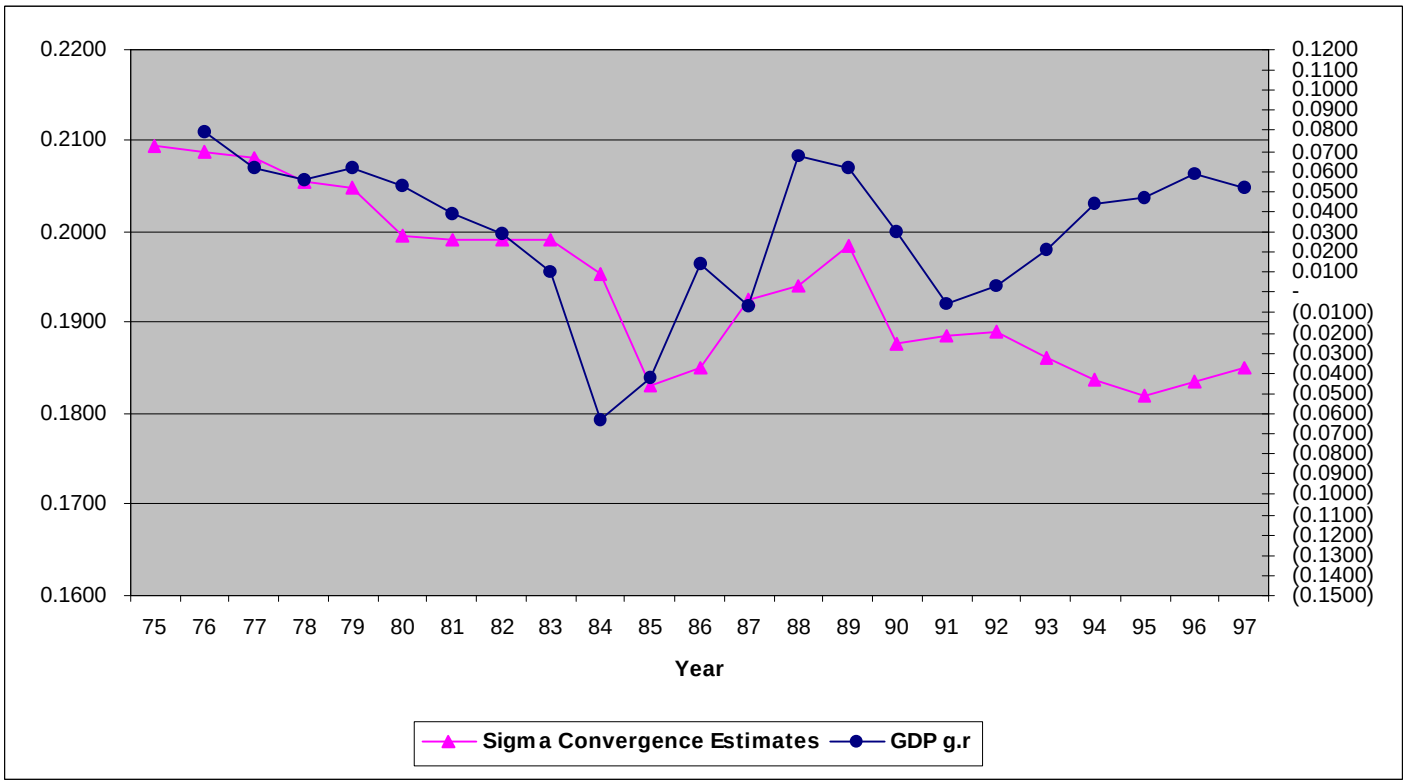
5. CONVERGENCE AND SHIFT ANALYSIS: A SYNTHESIS

In this section, the results of the convergence analysis and the shift analysis discussed above are seen to be complementary and integral. Indeed, regional convergence relates significantly to the critical alterations or shifts in the growth and structure of the economy of the various regions over time.

5.1. Convergence and Overall GDP Growth

A comparison of δ-dispersion and national GDP growth reveals that changes in δ-dispersion closely follow changes in the country's overall GDP growth (**Figure 5**). In general, the standard deviation of per capita GRDP fell during years of slow growth and rose during periods when the overall GDP growth rate was rising.

FIGURE 5
d Convergence Estimates and GDP Growth Rate



At the same time, the period 1975-1986 which is characterized by a high speed of β-convergence is also a seen to be a period of declining GDP growth rate. In contrast, the period 1987-1997 which witnessed the reduction in the size of the β-coefficient is one of accelerated GDP growth.

This finding is consistent with the experience of other Asian countries including Malaysia and Thailand where a positive relationship was found between regional dispersion and the growth rate of GDP (La Croix, 1998). In these economies, high growth was largely driven by accelerated industrialization. It, therefore, provides caution that high levels of economic growth (especially where it is led by the rapid expansion of the industry sector) may bring with it the risks of regional stagnation, slow regional convergence or even divergence. In a sense,

this finding emphasizes the possible tension between NIC-hood and regional convergence.

5.2. Convergence and Agricultural Growth

On the other hand, **Table 8** establishes the link between the speed of convergence and the growth of the agricultural sector. It suggests that the speed of convergence is relatively high (as in the period 1975-1986) when the agriculture sector is growing at a faster rate than the industrial sector. Conversely, when the overall growth is being propelled by the industrial sector, the speed of convergence is relatively slow (as in the period 1987-1997). This is not surprising considering that most of the regions with relatively low income are also the regions that are predominantly agricultural. Thus, when regions with large agricultural bases grow at a faster rate than the rest of the economy there is a tendency for regional disparities to narrow.[4]

It should be pointed out that not all of the poor regions which have large agriculture sectors were able to benefit from the comparatively rapid growth of the said sector in 1975-1986. These regions include Regions II, V, VI and VIII. The agriculture sector in these regions lagged behind the rest of the country during this period (**Table 6**). As a result, the per capita GRDP ranking of these regions either stagnated or suffered some deterioration (**Table 2**). This points at the need to look in depth at some of the structural constraints confronting these regions.

Also, from 1987 onwards, the development of Regional Agro-Industrial Centers (RAICs) was pursued as a strategy of accentuating economic growth while simultaneously enhancing the linkage between the agriculture and industry sectors. On both counts, the RAICs strategy registered considerable success. The agriculture sector and the industry sector both grew at a relatively high rate in the regions which posted positive TNS values in 1987-1997 (namely, CAR, Regions I, III, IV, and VII). A similar story can be told of Region IX in the 1992-1997 period (**Table 6**). What appears to be missing though is an overall strategy to improve productivity in agriculture quite apart from the impetus that greater forward linkage and market access within specific regions that is implied by the RAICS strategy.

6. A ROADMAP FOR REGIONAL DEVELOPMENT

The goals of regional development are two-fold: (1) to promote the reduction of regional disparity, and (2) to enhance accelerated growth of the national economy. However, the analysis above indicates that the NIC-hood path of rapid GDP growth via industrialization introduces greater risks of regional divergence. In this section, the roadmap that shows the way towards a reconciliation of these two goals is delineated.

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[4] In this regard, it is also interesting to note the finding of Balisacan (1997) that the agricultural sector led the way to poverty alleviation in the 1980s and early 1990s despite its sluggish growth.

6.1. Addressing Structural Constraints

Structural constraints refer to geographic characteristics or natural endowments of the region such as climate, water resources, topography and soil types that affects their development growth. Lamberte, et.al (1993) refer to these constraints, being inflexible, as binding constraints. In the same study, a survey of the structural endowments of the various regions showed their commonalities and variations. **Table 9** presents a matrix of these structural advantages and disadvantages.

In more recent years, especially in 1987-1997, changes in climatic conditions have been observed such that some regions which structurally are not prone to destructive typhoons have experienced the same fate as those which are normally visited by these calamities. These include Regions II, VI, VII, and all the Mindanao regions. Moreover, the occurrence of abnormal weather conditions such as long dry spell (El Nino) have wrought havoc to many of the regions especially those in the Visayas and Mindanao. Because of this, these regions fail to grow in tandem with the other regions even during periods when the agriculture sector is buoyant. Thus, regional development strategies may have to be redesigned in order to factor in the specific constraints brought about the regions' topographic characteristics. In this light, it is critical to realize that the present emphasis on a sector-based approach to regional development may have to be tempered with an equal emphasis on a spatial-based approach.

Finally, given the tendency of certain regions to lag in terms of overall economic development, it is also important to recognize the bigger role that government has to play in the provision of basic social services in these regions. This is so because the relatively low levels of income in these regions severely constrain household financing of said services. With the provision of many social services devolved to local governments, the need for an equalization component in intergovernmental transfer is further highlighted (see sub-section 6.5).

6.2. Developing Infrastructures

The uneven economic progress and income gaps among regions have always been blamed to disparities in the level of infrastructure development (Lamberte, et al, 1993; Basilio and Gundaya, 1997). (**Table 10**) shows the strong correlation between total net shift values and major infrastructure development indicators in telecommunications, land transportation and power and energy during the period 1987-1997. This finding lends support to the recurring call for improving regional allocation of infrastructure investments so that lagging regions can have the chance to catch up and increase their growth potentials.

During the past decade, infrastructure investments in the regions have relied mostly on the development and promotion of Regional Agro-Industrial Center (RAICs). The government aimed to build at least the off-site infrastructure (i.e. airport, seaport, telecommunication, roads and bridges, power, and water supply) to attract industries to locate in the regions outside Metro Manila. Originally, the focus is on one location in each of the country's 13 regions. However, in the course of implementation, additional RAICs were

included. At present there are 21 RAICs but only eight are operating. These are the ones located in CAR (Baguio Export Processing Zone), Regions III (Bataan EPZ), IV (Cavite EPZ), VII (Mactan EPZ), IX (Ayala de Zamboanga), X (PHIVIDEC Industrial Estate) and XI (Hacienda Espina in General Santos). The other planned RAICs did not become operational due to a number of interrelated problems: budget constraints in program implementation, land acquisition problems, delays in the processing of applications for conversion as well as political differences among leaders in the region as to which RAIC to support.

The challenge for reducing disparities in infrastructure development is staggering. In terms of road development, the overall paved road ratio is only 20 percent due to the huge inventory of barangay roads which are only 6 percent paved. Less economically developed regions including CAR, and Regions II, IV, -B, IX, X, XII and CARAGA have very low paved roads and low road densities. Overall, irrigated land only slightly increased from 1.24 million hectares in 1993 to 1.4 million hectares as of May 1998, which is only 45.2 percent of the potential irrigable area.

Efforts girded towards the development of the regions outside of NCR and its adjacent regions must be pursued with greater resolve in the coming years. National policies regarding infrastructure investments can drive speedier regional convergence. Improvements in transportation and introduction of current communication technologies can help increase the density of economic activities and reduce transaction costs in these regions.

6.3. Enhancing Agriculture and Industrial Linkages

The implementation of the Regional Agro-Industrial Centers (RAICs) or the growth networks linking two or more RAICs are promising routes to dispersing concentration away from the capital region. Against the backdrop of its slow implementation, what can be learned in the past that will be helpful in continuing this strategy? The experience of the Aquino regime provided the lesson that limited government resources with competing demands would not allow for the simultaneous development of off-site infrastructure for all RAICs. The Ramos administration learned this valuable lesson and in its medium-term plan, adopted the strategy of developing the identified growth areas in order of priority. While not many of the identified RAICs became operational, the modest accomplishments within its leadership term should provide the next administration the lesson of being more realistic in setting goals and being brave in taking the cudgels of political decisions in the name of development. The next medium-term plan being formulated, while mentioning RAICs, regional growth centers, SEZs and provincial agri-industrial centers/enterprises (PICs/PIEs), has refused the explicit identification of these areas for infrastructure development. This, therefore, increases the risk of succumbing to policy arbitrariness or political maneuverings, or, at the worst, of non-delivery. The road towards regional development in the future connects with the existing roads of the past. Thus, lessons from past failures can aid in improving current policies and programs or at least, caution the concerned to avoid committing the same pitfalls.

6.4. Increasing Agricultural Productivity

The misfortunes met by the agriculture sector especially during the past decade which have affected the poor and largely agricultural regions have flagged the need for greater concern for the sector. The recent enactment of the Agriculture and Fisheries Modernization Act (AFMA) can help the sector improve its future performance and raise the income of the agriculture-based regions. In order to improve the productivity of the agriculture sector, earlier studies have identified the following priority concerns: development of rural infrastructure (including farm-to-market roads, rehabilitation of existing and construction of new irrigation system, post-harvest facilities), more resources and better allocation of the same in the area of agricultural research and extension, and improvement of access to agricultural credit.

6.5. Introducing an Equalization System in Intergovernmental Transfers

Since 1992, greater fiscal decentralization has been effected by the enactment and implementation of the Local Government Code. Since then, significant gains in efficiency (production efficiency, allocative efficiency and fiscal efficiency) have been achieved (Loehr and Manasan 1998). However, one of the pitfalls of fiscal decentralization is the potential for increased regional inequality. This stems from the fact that the distribution of tax bases are inherently unequal.

The present distribution of the Internal Revenue Allotment (IRA), a block grant from the central government to local government units (LGUs), has had some equalizing effect, as indicated by the inverse relationship between per capita IRA and per capita personal income. However, the analysis also suggests that higher per capita total LGU revenues (i.e., combination of IRA and local source revenues) is associated with higher per capita personal income (Alonzo 1998). This implies that the present equalizing effect of the IRA is not sufficient to compensate for intrinsic disparities in tax bases. Because of this, there is a need to design an equalization formula that will address the existing horizontal fiscal imbalance implied in the present IRA distribution formula.

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Table 1
Correlation Coefficient Between Per Capita GRDP and Social Development Indicators, 1988 and 1997

	1988	**1997**
Functional Literacy Rate	.746	.545
Infant Mortality Rate	-.919	-.784
Poverty Incidence	-.433	-.749

Table 2
Per Capita Gross Regional Domestic Product
At Constant Prices

REGION/YEAR	Regional Per Capita Product (P'000) 1975	1980	1986	1987	1992	1997
NCR METRO MANILA	28,345.92	32,201.93	24,304.70	24,559.28	25,122.39	27,309.66
CAR CORDILLERA				10,521.78	11,396.46	14,977.90
I ILOCOS REGION	5,965.34	6,891.91	7,385.78	5,497.11	5,559.61	6,970.70
II CAGAYAN VALLEY	6,566.96	8,188.57	6,254.26	5,695.17	5,763.42	6,961.19
III CENTRAL LUZON	10,349.50	12,270.66	10,066.11	10,034.81	10,866.17	12,003.29
IV SOUTHERN TAGALOG	13,245.05	15,149.97	13,382.57	12,149.79	12,672.04	13,060.50
V BICOL REGION	5,069.38	6,165.70	5,123.18	4,607.25	5,359.37	5,737.33
VI WESTERN VISAYAS	9,818.96	10,786.87	7,914.03	8,427.22	9,596.48	10,614.69
VII CENTRAL VISAYAS	8,991.53	11,652.74	9,925.89	9,092.69	9,862.38	11,318.72
VIII EASTERN VISAYAS	5,806.10	6,227.80	5,282.36	5,078.45	5,360.46	5,914.65
IX WESTERN MINDANAO	5,797.63	8,060.88	7,600.23	6,409.95	6,348.84	7,052.60
X NORTHERN MINDANAO	8,538.23	11,059.36	10,448.44	10,263.01	8,980.33	9,603.74
XI SOUTHERN MINDANAO	11,909.75	12,324.57	11,907.42	11,999.70	11,496.85	12,080.56
XII CENTRAL MINDANAO	7,356.52	10,087.28	9,119.84	8,632.31	7,283.23	7,779.67
PHILIPPINES	11,108.60	13,137.07	11,094.06	10,756.08	11,227.83	12,425.43

REGION/YEAR	Ratio of Regional Per Capita Product to National Per Capita Product (%) 1975	1980	1986	1987	1992	1997
NCR METRO MANILA	255.17	245.12	219.08	228.33	223.75	219.79
CAR CORDILLERA				97.82	101.50	120.54
I ILOCOS REGION	53.70	52.46	66.57	51.11	49.52	56.10
II CAGAYAN VALLEY	59.12	62.33	56.37	52.95	51.33	56.02
III CENTRAL LUZON	93.17	93.40	90.73	93.29	96.78	96.60
IV SOUTHERN TAGALOG	119.23	115.32	120.63	112.96	112.86	105.11
V BICOL REGION	45.63	46.93	46.18	42.83	47.73	46.17
VI WESTERN VISAYAS	88.39	82.11	71.34	78.35	85.47	85.43
VII CENTRAL VISAYAS	80.94	88.70	89.47	84.54	87.84	91.09
VIII EASTERN VISAYAS	52.27	47.41	47.61	47.21	47.74	47.60
IX WESTERN MINDANAO	52.19	61.36	68.51	59.59	56.55	56.76
X NORTHERN MINDANAO	76.86	84.18	94.18	95.42	79.98	77.29
XI SOUTHERN MINDANAO	107.21	93.82	107.33	111.56	102.40	97.22
XII CENTRAL MINDANAO	66.22	76.78	82.20	80.26	64.87	62.61
PHILIPPINES	100.00	100.00	100.00	100.00	100.00	100.00

REGION/YEAR	Annual Rates of Change (%) 1975-1980	1980-1986	1987-1992	1992-1997	1975-1986	1987-1997	1975-1997
NCR METRO MANILA	2.58	(4.58)	0.45	1.68	(1.39)	1.07	(0.17)
CAR CORDILLERA			1.61	5.62		3.59	
I ILOCOS REGION	2.93	1.16	0.23	4.63	1.96	2.40	0.71
II CAGAYAN VALLEY	4.51	(4.39)	0.24	3.85	(0.44)	2.03	0.27
III CENTRAL LUZON	3.46	(3.25)	1.60	2.01	(0.25)	1.81	0.68
IV SOUTHERN TAGALOG	2.72	(2.05)	0.85	0.61	0.09	0.73	(0.06)
V BICOL REGION	3.99	(3.04)	3.07	1.37	0.10	2.22	0.56
VI WESTERN VISAYAS	1.90	(5.03)	2.63	2.04	(1.94)	2.33	0.35
VII CENTRAL VISAYAS	5.32	(2.64)	1.64	2.79	0.90	2.21	1.05
VIII EASTERN VISAYAS	1.41	(2.71)	1.09	1.99	(0.86)	1.54	0.08
IX WESTERN MINDANAO	6.81	(0.98)	(0.19)	2.12	2.49	0.96	0.89
X NORTHERN MINDANAO	5.31	(0.94)	(2.63)	1.35	1.85	(0.66)	0.54
XI SOUTHERN MINDANAO	0.69	(0.57)	(0.85)	1.00	(0.00)	0.07	0.06
XII CENTRAL MINDANAO	6.52	(1.67)	(3.34)	1.33	1.97	(1.03)	0.25
PHILIPPINES	3.41	(2.78)	0.86	2.05	(0.01)	1.45	0.51

Table 3
Rate of Growth of GRDP and Population
In Percent

REGION/YEAR	GRDP 1975-1986	GRDP 1987-1997	GRDP 1975-1997	POPULATION 1975-1986	POPULATION 1987-1997	POPULATION 1975-1997
NCR METRO MANILA	1.92	4.31	3.10	3.36	3.21	3.27
CAR CORDILLERA		5.54			1.88	
I ILOCOS REGION	3.80	4.05	1.53	1.80	1.61	0.81
II CAGAYAN VALLEY	2.22	3.35	1.65	2.67	1.29	1.38
III CENTRAL LUZON	2.35	4.21	3.18	2.61	2.36	2.49
IV SOUTHERN TAGALOG	3.19	4.34	3.24	3.09	3.59	3.30
V BICOL REGION	2.19	3.14	2.14	2.09	0.91	1.56
VI WESTERN VISAYAS	0.11	3.44	2.00	2.09	1.08	1.64
VII CENTRAL VISAYAS	3.07	3.99	3.02	2.15	1.74	1.95
VIII EASTERN VISAYAS	0.82	2.47	1.44	1.69	0.92	1.35
IX WESTERN MINDANAO	5.88	3.27	3.71	3.30	2.29	2.79
X NORTHERN MINDANAO	5.09	2.57	3.74	3.18	3.25	3.19
XI SOUTHERN MINDANAO	3.43	1.93	2.74	3.43	1.87	2.67
XII CENTRAL MINDANAO	4.34	2.19	3.02	2.32	3.26	2.76
PHILIPPINES	2.62	3.77	2.99	2.63	2.28	2.46

Table 4
Regional Shares of Output
At Constant Prices

REGION/YEAR	1975	1980	1986	1987	1992	1997
NCR METRO MANILA	30.14	30.20	27.96	29.28	29.97	30.85
CAR CORDILLERA				1.84	1.89	2.18
I ILOCOS REGION	4.17	3.86	4.73	2.97	2.83	3.05
II CAGAYAN VALLEY	2.72	2.87	2.60	2.12	1.94	2.04
III CENTRAL LUZON	9.32	9.33	9.06	9.31	9.84	9.72
IV SOUTHERN TAGALOG	14.78	14.67	15.70	14.75	15.79	15.59
V BICOL REGION	3.46	3.39	3.31	3.07	3.05	2.89
VI WESTERN VISAYAS	8.71	7.73	6.63	7.27	7.42	7.05
VII CENTRAL VISAYAS	6.52	6.98	6.83	6.43	6.55	6.57
VIII EASTERN VISAYAS	3.23	2.76	2.66	2.62	2.38	2.31
IX WESTERN MINDANAO	2.54	3.23	3.58	3.11	2.95	2.97
X NORTHERN MINDANAO	4.23	4.83	5.49	5.57	5.19	4.96
XI SOUTHERN MINDANAO	6.92	6.53	7.54	7.84	6.81	6.56
XII CENTRAL MINDANAO	3.26	3.63	3.91	3.82	3.39	3.28
PHILIPPINES	100.00	100.00	100.00	100.00	100.00	100.00

Table 5
b-Convergence in Various Economies

Country/Period	b	R^2
Philippines		
1975-97	0.0060 (0.0021)	0.42
1975-86	0.0147 (0.0077)	0.25
1987-97	0.0079 (0.0079)	0.01
Japan		
1930-90	0.0279 (0.0033)	0.92
1955-90	0.0191 (0.00035)	0.59
1930-1987	0.034	
1960-1988	0.033	
India		
1961-91	0.0027 (0.0057)	0.65
1961-71	0.0125 (0.0129)	0.77
1971-81	0.0034 (0.0124)	0.78
1981-91	0.0022 (0.0083)	0.89
China		
1953-78	-0.003 (0.005)	0.01
1978-96	0.008 (0.007)	0.05
Malaysia		
1965-95	0.020 (0.016)	0.18
Thailand		
1975-95	-0.0077 (0.004)	0.05
United States		
1880-1988	0.0249	
European OECD Countries		
1950-1985	0.0178	
Canada		
1961-1991	0.024	
Australasia		
1861-1991	0.0121	
South Pacific Economies		
1971-1993	0.0432	

Source: Philippines (this study); Japan, India, China, Malaysia and Thailand (La Croix, et al., 1998); U.S., European OECD Countries, Canada, Australasia and South pacific Economies (as cited in Cashin and Sahay, 1996). Figures in parentheses are standard error values.

Table 6
Average Annual Growth Rates of Gross Regional Domestic Product
(In Percent)

SECTOR	REGION														
	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	TOTAL
1975-1980															
Agriculture, Fishery and Forestry			4.73	4.82	4.49	4.12	3.16	0.85	7.24	3.90	15.99	8.42	3.91	9.50	5.32
Industry	6.84		4.35	18.29	7.61	6.98	15.01	4.92	10.98	0.47	8.93	12.81	8.45	10.31	7.34
Service	5.69		4.64	5.11	5.79	6.21	6.35	5.63	6.19	4.65	6.13	7.69	4.66	5.28	5.76
GDP	6.26		4.59	7.41	6.23	6.06	5.77	3.70	7.70	2.93	11.41	9.07	4.99	8.51	6.22
1980-1986															
Agriculture, Fishery and Forestry			6.90	2.12	1.27	3.00	1.33	(1.11)	(0.73)	2.41	2.92	4.22	4.41	1.15	2.37
Industry	(2.81)		1.76	(16.88)	(2.29)	(0.76)	(10.22)	(9.37)	(3.17)	(7.11)	(1.28)	(0.03)	(1.76)	1.91	(2.67)
Service	(0.35)		0.34	(0.40)	(0.37)	1.48	(0.10)	(0.63)	0.75	(0.25)	(0.35)	0.58	1.29	(0.17)	0.13
GDP	(1.55)		3.14	(1.91)	(0.77)	0.85	(0.70)	(2.79)	(0.64)	(0.89)	1.48	1.88	2.14	0.99	(0.28)
1987-1992															
Agriculture, Fishery and Forestry		1.88	2.99	1.75	4.64	2.77	1.31	3.37	4.00	(0.66)	1.46	0.12	(1.21)	(0.48)	1.69
Industry	2.09	3.51	(0.63)	(2.82)	5.38	6.32	6.07	2.09	1.22	1.95	1.62	1.50	(0.82)	0.86	3.00
Service	4.73	5.66	2.19	2.16	2.65	3.77	3.22	4.45	4.76	2.31	3.00	3.60	2.92	2.71	4.00
GDP	3.59	3.68	2.15	1.32	4.25	4.53	2.98	3.52	3.49	1.10	2.00	1.67	0.23	0.67	3.11
1992-1997															
Agriculture, Fishery and Forestry		3.44	5.09	5.38	3.39	2.74	1.91	0.90	2.45	1.53	4.49	1.54	0.79	1.20	2.46
Industry	5.16	9.71	13.30	8.46	4.62	4.51	4.40	5.05	4.83	6.46	8.34	4.50	6.75	5.69	5.33
Service	4.96	5.39	4.34	4.45	4.13	4.90	4.05	4.41	4.83	3.74	2.92	4.67	4.76	5.44	4.71
GDP	5.04	7.42	5.99	5.42	4.17	4.16	3.31	3.36	4.49	3.86	4.56	3.48	3.66	3.74	4.43
1975-1986															
Agriculture, Fishery and Forestry			5.91	3.34	2.72	3.51	2.16	(0.22)	2.82	3.09	8.67	6.11	4.18	4.87	3.70
Industry	1.46		2.93	(2.42)	2.09	2.68	0.48	(3.13)	3.02	(3.74)	3.24	5.61	2.75	5.65	1.76
Service	2.35		2.27	2.07	2.39	3.61	2.78	2.17	3.19	1.95	2.54	3.75	2.81	2.27	2.65
GDP	1.92		3.80	2.22	2.35	3.19	2.19	0.11	3.07	0.82	5.88	5.09	3.43	4.34	2.62
1987-1997															
Agriculture, Fishery and Forestry		2.66	4.04	3.55	4.01	2.76	1.61	2.12	3.22	0.43	1.38	0.83	(0.22)	(2.70)	2.08
Industry	3.61	6.56	6.11	2.66	5.00	5.41	5.23	3.56	3.01	4.18	3.60	2.99	2.89	2.34	4.16
Service	4.84	5.52	3.26	3.30	3.39	4.33	3.63	4.43	4.80	3.02	1.84	4.13	3.84	2.08	4.35
GDP	4.31	5.54	4.05	3.35	4.21	4.34	3.14	3.44	3.99	2.47	1.88	2.57	1.93	0.19	3.77
1975-1997															
Agriculture, Fishery and Forestry			2.68	1.83	3.01	3.46	0.11	1.05	0.99	0.33	4.18	3.23	1.86	1.63	2.28
Industry	2.31		(0.57)	0.83	3.79	3.24	5.34	1.74	4.00	1.28	5.61	5.20	5.02	5.98	3.14
Service	3.75		1.64	1.70	2.59	3.05	3.33	2.99	3.17	2.98	2.38	3.35	2.44	2.63	3.23
GDP	3.10		1.53	1.65	3.18	3.24	2.14	2.00	3.02	1.44	3.71	3.74	2.74	3.02	2.99

Table 7
Structure of Gross Regional Domestic Product, By Sector
(In Percent)

SECTOR	REGION														
	NCR	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	TOTAL
1975															
Agriculture, Fishery and Forestry	-		33.31	51.73	22.95	24.32	56.68	38.61	21.17	39.89	46.24	38.44	43.97	52.68	24.08
Industry	49.13		28.19	15.08	38.86	43.81	11.14	25.25	25.27	35.56	11.60	20.15	16.17	18.48	34.74
Service	50.87		38.49	33.19	38.19	31.87	32.17	36.14	53.56	24.55	42.16	41.41	39.87	28.84	41.18
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1980															
Agriculture, Fishery and Forestry	-		33.55	45.78	21.13	22.17	50.02	33.60	20.73	41.81	56.56	37.31	41.75	55.14	23.08
Industry	50.48		27.87	24.43	41.46	45.73	16.93	26.77	29.35	31.52	10.36	23.84	19.01	20.07	36.62
Service	49.52		38.58	29.79	37.41	32.10	33.05	39.63	49.92	26.67	33.07	38.85	39.25	24.79	40.31
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1986															
Agriculture, Fishery and Forestry	-		41.59	58.30	23.88	25.16	56.49	37.22	20.62	50.91	61.56	42.76	47.62	55.68	27.02
Industry	46.75		25.70	9.04	37.79	41.51	9.25	17.57	25.14	21.36	8.78	21.28	15.05	21.19	31.66
Service	53.25		32.71	32.66	38.33	33.33	34.26	45.21	54.24	27.72	29.66	35.96	37.33	23.13	41.32
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1987															
Agriculture, Fishery and Forestry	-	22.53	42.80	52.81	22.53	29.73	42.40	35.77	14.71	38.39	52.56	40.93	45.07	46.83	24.38
Industry	44.42	53.89	14.65	13.49	41.02	39.60	17.99	23.60	34.17	29.13	14.73	26.30	23.89	31.07	34.59
Service	55.58	23.58	42.55	33.70	36.45	30.67	39.61	40.63	51.12	32.48	32.71	32.77	31.04	22.10	41.03
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1992															
Agriculture, Fishery and Forestry	-	20.64	44.60	53.93	22.95	27.32	39.07	35.50	15.07	35.15	51.19	37.91	41.92	44.20	22.75
Industry	41.29	53.44	12.76	10.95	43.30	43.11	20.85	22.01	30.59	30.38	14.46	26.09	22.65	31.37	34.41
Service	58.71	25.91	42.63	35.12	33.75	29.57	40.07	42.49	54.34	34.48	34.34	36.00	35.43	24.43	42.84
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1997															
Agriculture, Fishery and Forestry	-	17.08	42.75	53.83	22.10	25.51	36.50	31.47	13.66	31.37	51.01	34.48	36.42	39.06	20.68
Industry	41.53	59.37	17.82	12.63	44.22	43.84	21.98	23.86	31.09	34.37	17.27	27.40	26.23	34.43	35.91
Service	58.47	23.55	39.43	33.54	33.67	30.64	41.52	44.67	55.24	34.26	31.72	38.12	37.35	26.51	43.41
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1975-1986															
Agriculture, Fishery and Forestry	-		36.88	49.49	21.82	23.71	52.11	35.02	19.99	42.62	56.53	39.17	43.83	53.71	24.03
Industry	49.64		26.15	19.84	41.32	44.11	14.98	26.06	28.43	30.56	9.98	21.64	17.46	20.43	35.45
Service	50.36		36.97	30.68	36.87	32.17	32.91	38.92	51.58	26.82	33.49	39.20	38.71	25.85	40.52
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1987-1997															
Agriculture, Fishery and Forestry	-		43.02	53.16	22.65	27.24	39.09	34.01	14.77	34.20	51.42	37.67	40.70	43.02	22.36
Industry	42.45		16.03	13.25	42.72	42.71	20.31	22.93	31.31	32.02	15.85	26.46	24.40	32.51	35.11
Service	57.55		40.96	33.60	34.63	30.06	40.60	43.06	53.91	33.79	32.73	35.87	34.90	24.47	42.53
TOTAL	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 8
Regional Convergence and Growth of Agriculture and Industry Sectors

	b - Coefficient	Agriculture Growth Rate	Industry Growth Rate
1975-86	0.0147	3.7	1.8
1987-97	0.0079	2.1	4.2

Table 9
Matrix of Structural Advantages and Disadvantages of Agricultural Regions

REGION	CLIMATE	WATER RESOURCES	TOPOGRAPHY	SOIL TYPE
I	Two pronounced seasons	No water basin to provide enough groundwater	Flat lands and with relatively hilly and mountainous slope	Largely deep, low fertility and acidic
II	Seasons not very pronounced/ Prone to floods and typhoons	River basin has high storage of groundwater	Flat lands with relatively hilly and mountainous slope	Largely deep, low fertility and acidic
III	Generally two pronounced seasons / Prone to floods and typhoons	Large river basin	Flat lands	Well-drained, high fertility
IV	Generally two pronounced seasons but rainfall evenly distributed throughout the year/ Prone to floods and typhoons	Large river basin	Flat lands with relatively hilly and mountainous slope	Largely well drained, deep, low fertility and acidic
V	No dry season, Rainfall evenly distributed throughout the year/ Prone to floods and typhoons	River basin has low storage of groundwater	Relatively large flat lands with hilly and mountainous slope	Relatively high percent of well-drained high fertility but largely deep, low fertility and acidic
VI	Two pronounced seasons	River basin has high storage of groundwater	Flat lands	Largely well drained, deep, low fertility and acidic
VII	Seasons not very pronounced	No water basin to provide enough groundwater	Largely hilly and mountainous slope	About 50 percent well-drained, high fertility
VIII	No dry season, but with very pronounced rain period from November to January/ Prone to floods and typhoons	River basin has low storage of groundwater	Relatively large flat lands with hilly and mountainous slope	Largely well drained, deep, low fertility and acidic
IX	No dry season, but with very pronounced rain period from November to January	River basin has relatively high storage of groundwater	Flat lands and Uplands	Largely well drained, deep, low fertility and acidic
X	No dry season, but with very pronounced rain period from November to January	River basin has relatively high storage of groundwater	Predominantly hilly and mountainous slopes	Largely well drained, deep, low fertility and acidic
XI	No dry season, but with very pronounced rain period from November to January	River basin has relatively high storage of groundwater	Predominantly hilly and mountainous slopes	Largely well drained, deep, low fertility and acidic
XII	No dry season, but with very pronounced rain period from November to January	River basin has high storage of groundwater	Flat lands and with hilly and mountainous slopes	Largely well drained, deep, low fertility and acidic

Table 10
Rank Correlation Coefficients:
Total Net Shift Values and Infrastructure Development Indicators, 1987-1997

Infrastructure Development Indicator	**Spearman Rank Correlation Coefficient**
Road Density	0.4593
Percent Electrified	0.5978
Percent Irrigated	0.6703
Telephone Density	0.6571