# NARROWING DEVELOPMENT GAPS IN ASEAN

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Development gaps happen when there is a difference in either the per capita income or other social development between countries or regions. The enlargement process in the ASEAN widened further the existing developmental gap. Using GDP per capita, HDI index and information technology data, this paper examines the extent of the developmental gap in the ASEAN prior to the enlargement exercise and after the process. The paper also examines income convergence in the ASEAN over the period 1970-2003. The results reveal that income gap among the ASEAN members did not converge after decades of integration process. Comparison with the EU's integration experience shows that the structural funds and other policy tools executed by the EU are among the key elements of convergence that are absent in the ASEAN. Political will in ensuring compliance and effective implementation is clearly needed for a successful ASEAN economic integration.

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## 1.  INTRODUCTION

ASEAN[2] consists of heterogeneous group of countries with wide socio-economic development disparities. Despite the ASEAN's long integration process, there is still a wide variation between the member countries in terms of economic and social development. The disparity is more striking when the ASEAN-6[3] countries are compared to the CLMV countries[4] (Cambodia, Laos, Myanmar and Vietnam). The new members are significantly poorer than the pre-existing members with less established institutional structure and weak political regimes. The ASEAN per capita income varies substantially, from per capita GDP of US$28,265 for Singapore, US$728 for Indonesia and US$136 for Myanmar in 2000. The extent of urbanization varies as well from 100 percent in Singapore being urban in contrast to 30 percent of the population living in the urban areas in Myanmar (Yamazawa, n.d.).

There are increasing concerns on the possibility of creating two-tiered ASEAN. Various efforts such as Hanoi Plan of Action (HPA), Initiatives for ASEAN Integration (IAI) and the Declaration of ASEAN Community were initiated in view of this concern. This is also reflected in the Declaration of the Sixth ASEAN Summit in Hanoi in December 1998 to "narrow the development gap among Member Countries to reduce poverty and socio-economic disparity in the region" and "facilitate economic integration of new ASEAN members."

Against this background, the objective of this paper is to examine the developmental gap in ASEAN and to evaluate whether the gap converged after the years of the integration process or not. The structure

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[2] ASEAN stands for Association of South East Asian Nations.  It was established in 1967 in Bangkok, Thailand, with the signing of the Bangkok Declaration by the five founding members namely; Singapore, Malaysia, Indonesia, Philippines and Thailand. Brunei Darussalam joined the Association in 1984 after the country gained her independence from British colonialism. The main objectives of ASEAN were to accelerate economic growth, social progress and cultural development and to promote peace and stability in the region. The enlargement of ASEAN included four countries (Vietnam, Myanmar, Laos and Cambodia) and took place in three phases. Vietnam was the first to join the Association in 1995, followed by Myanmar and Laos in 1997 and finally Cambodia in 1999.
[3] ASEAN-6 refers to the older members of ASEAN which comprise Brunei, Indonesia, Malaysia, Philippines, Thailand and Singapore.
[4] These are new members of ASEAN that joined the group in the 1990s.

of this paper is as follows. Section 2 examines the extent of developmental gap in the ASEAN. Having shown that there is a wide gap between the members, section 3 focuses on the convergence level among the ASEAN members. Section 4 analyses the long-run convergence in the ASEAN using empirical testing. In section 5, comparison between the ASEAN and EU is made by examining the groupings' convergence strategies and policies. Section 6 concludes with some policy recommendations.

## 2. DEVELOPMENT GAP

### 2.1 Definition

Development gaps arise when there is an unequal level of development between countries, regions or districts within a country. The definition of development gaps is, however, not a straight forward one and the discussion on what would be the best and appropriate indicators to explain the gap is still going on. Most studies use GDP per capita level and growth to assess development gaps. Limitations of GDP per capita in measuring people's well-being provoked intense debates on the use of per capita income to measure development. Todaro (1999), for example, asserted that the meaning and objectives of development should include the provision of basic needs, reducing inequality, raising living standards through appropriate economic growth, improving self-esteem in relation to the developed countries, and expanding freedom of choice in the market and beyond. Amartya Sen (1999), on the other hand, sees development as "a process of expanding the real freedom that people enjoy." In the 1990s the UNDP[5] introduced the Human Development Index (HDI), which is now being widely used as an indicator for socio-economic development. This index is a simple average of three indexes which consist of longevity (measured by life expectancy at birth), education (measured by adult literacy and combined primary, secondary, and tertiary enrollments), and living standard (measured by GDP per capita in purchasing power parity terms)". Hence, the definition of development and development gaps is multifaceted and changes with time. In this paper we will be using the multifaceted concept of development to explain development gaps in ASEAN.

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[5] United Nation Development Programme.

## 2.2. Developmental Gap in ASEAN

In this section, development gap in the ASEAN is assessed from three perspectives, i.e. the income, human development and digital gap.

### 2.2.1. Income Gap

Income gap includes differences in income measured by average gross domestic product (GDP) per person or per capita GDP and poverty level. In terms of GDP per capita, there is a significant income disparity between the ASEAN member countries. This is evident when one compares the members of the older ASEAN as well as the ASEAN-10. In fact, it is found that the disparity is more striking between the ASEAN-10. Table 1 shows the GDP per capita of the six initial ASEAN members (Malaysia, Singapore, Thailand, Brunei, Indonesia and the Philippines)[6]. Note that the disparity of income between the members was already large at the inception of the Association. It is apparent that ASEAN-6 can be categorized into three groups. Brunei and Singapore are high income countries, while Malaysia, Philippines and Thailand can be categorized as upper middle income countries. Indonesia on the other hand, falls under the lower middle income category. In 1970, Brunei's GDP per capita was 43 times higher than that of Indonesia. By 1995, Singapore over took Brunei to be the richest country in ASEAN while the Philippines fell into the same category of Indonesia as lower middle income country. Singapore was 25 and 21 times richer than Indonesia in 1995 and 2003 respectively (see Table 1 and 2). This shows that the gap between the old members of ASEAN still exist but is getting smaller.

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[6] Hereafter referred as ASEAN-6.

**Table1: GDP Per Capita of ASEAN-6, 1970-1995
(millions US$ in current prices).**

| Countries/ Years | Malaysia | Indonesia | Singapore | Brunei | Thailand | Philippines |
|---|---|---|---|---|---|---|
| 1970 | 378 | 114 | 1164 | 4851 | 204 | 208 |
| 1971 | 477 | 125 | 1352 | 5305 | 219 | 225 |
| 1972 | 532 | 140 | 1574 | 5780 | 231 | 241 |
| 1973 | 618 | 162 | 1834 | 6429 | 263 | 273 |
| 1974 | 713 | 186 | 2100 | 7322 | 291 | 305 |
| 1975 | 772 | 210 | 2362 | 7765 | 326 | 348 |
| 1976 | 894 | 233 | 2651 | 9607 | 369 | 389 |
| 1977 | 1005 | 265 | 3007 | 10968 | 422 | 430 |
| 1978 | 1124 | 300 | 3461 | 12205 | 488 | 475 |
| 1979 | 1308 | 338 | 4071 | 15746 | 547 | 536 |
| 1980 | 1498 | 392 | 4815 | 15383 | 612 | 599 |
| 1981 | 1710 | 451 | 5711 | 13010 | 696 | 664 |
| 1982 | 1880 | 469 | 6424 | 13894 | 756 | 709 |
| 1983 | 2011 | 516 | 7104 | 13881 | 821 | 720 |
| 1984 | 2186 | 560 | 7878 | 13929 | 894 | 683 |
| 1985 | 2162 | 578 | 7863 | 13834 | 934 | 654 |
| 1986 | 2171 | 612 | 8071 | 11955 | 983 | 660 |
| 1987 | 2291 | 648 | 8973 | 12020 | 1089 | 692 |
| 1988 | 2512 | 695 | 10176 | 12237 | 1256 | 742 |
| 1989 | 2771 | 762 | 11426 | 12652 | 1446 | 796 |
| 1990 | 2393 | 581 | 12105 | 13972 | 1536 | 729 |
| 1991 | 2568 | 628 | 13727 | 14496 | 1747 | 731 |
| 1992 | 3087 | 681 | 15446 | 14823 | 1964 | 834 |
| 1993 | 3317 | 825 | 17182 | 14582 | 2191 | 837 |
| 1994 | 3663 | 909 | 21681 | 15252 | 2501 | 965 |
| 1995 | 4313 | 1019 | 25581 | 17723 | 2896 | 1093 |

*Source*: National Accounts Database of the Statistics Division of the United Nations Secretariat.

If we take into account the CLMV[7] countries, the gap is much wider. In 1995, Myanmar was the poorest country in the region with GDP per capita of US$239 mn. and the gap with the richest country (Singapore) was US$25342mn. Singapore was 93 times richer than Myanmar in that year. In 2003, Myanmar was still the poorest country between all with a GDP per capita income of US$179mn. This has resulted in a US$20,808mn. gap with Singapore. Singapore was 117 times richer than

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[7] Includes Cambodia, Laos, Myanmar and Vietnam.

Myanmar. Thus the gap between the ASEAN-10 countries has widened over the years.

**Table 2: GDP per capita of ASEAN-10, 1995-2003 (in millions of US$)**

| Years/ Countries | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|
| Singapore | 25581 | 25127 | 25147 | 20892 | 20611 | 22757 | 20553 | 20823 | 20987 |
| Brunei | 17723 | 17096 | 16227 | 11961 | 12670 | 12751 | 12121 | 12070 | 12971 |
| Malaysia | 4313 | 4766 | 4672 | 3257 | 3485 | 3874 | 3697 | 3924 | 4198 |
| Thailand | 2896 | 3134 | 2656 | 1900 | 2046 | 2026 | 1884 | 2043 | 2291 |
| Philippines | 1093 | 1184 | 1157 | 896 | 1018 | 980 | 924 | 959 | 973 |
| Indonesia | 1019 | 1167 | 1128 | 488 | 693 | 731 | 688 | 820 | 973 |
| Vietnam | 270 | 337 | 361 | 361 | 374 | 403 | 418 | 439 | 481 |
| Myanmar | 239 | 109 | 100 | 144 | 189 | 210 | 162 | 175 | 179 |
| Laos | 359 | 393 | 336 | 244 | 278 | 333 | 326 | 333 | 362 |
| Cambodia | 308 | 317 | 320 | 265 | 295 | 291 | 283 | 296 | 310 |

*Source:* National Accounts Database of the Statistics Division of the United Nations Secretariat, various years.

The gap between the ASEAN-6 and the CLMV countries is apparent as shown in Figure 1 and the gap remains wide despite of the integration process for more than a decade. Thus, there appears to be a two-tiered development in the ASEAN.

**Figure 1: Average GDP Per capita for ASEAN-6 and CLMV countries**
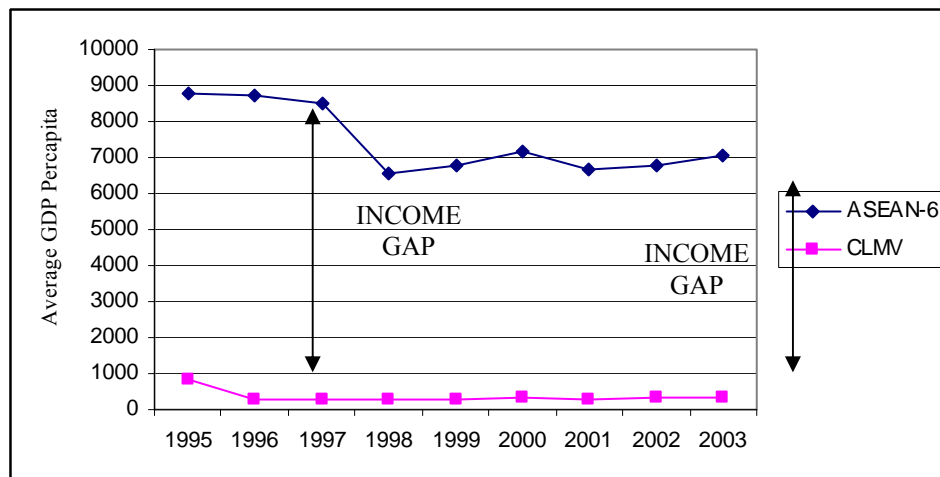
Closely related to income per capita is the poverty incidence. To examine the disparity of income distribution in the ASEAN, the members were divided into two groups, i.e. countries with low and high poverty incidence, using 20 percent poverty level as the demarcation line. Singapore and Brunei were excluded from the analysis because poverty level in these countries was nil. Figure 2 shows that Indonesia, Malaysia and Thailand fall under the first category while the poverty incidence in the CMLV countries and the Philippines was very high.

**Figure 2: Population in Poverty (%), 2002**
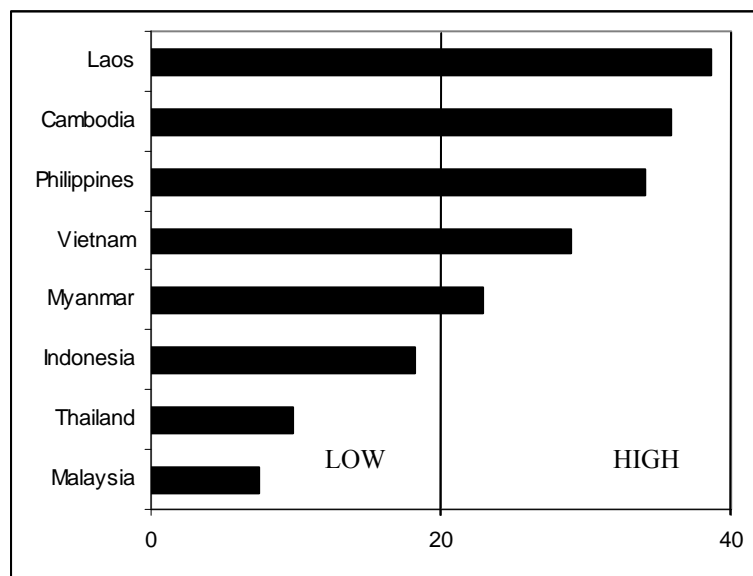


*Source*: Asian Development Bank, Key Indicators 2004

In Cambodia and Laos, more than 30 per cent of the population live with less US$1 per day (see Figure 3). This is in a sharp contrast to Singapore, Brunei, Malaysia and Thailand. There are more poor people in the Philippines than in Vietnam, even though the Philippines' GDP per capita exceeds Vietnam's average income. This indicates that the distribution of income in the Philippines is worse than that of Vietnam.

**Figure 3: Proportion of Population Living Below US$1 a Day, 2002**
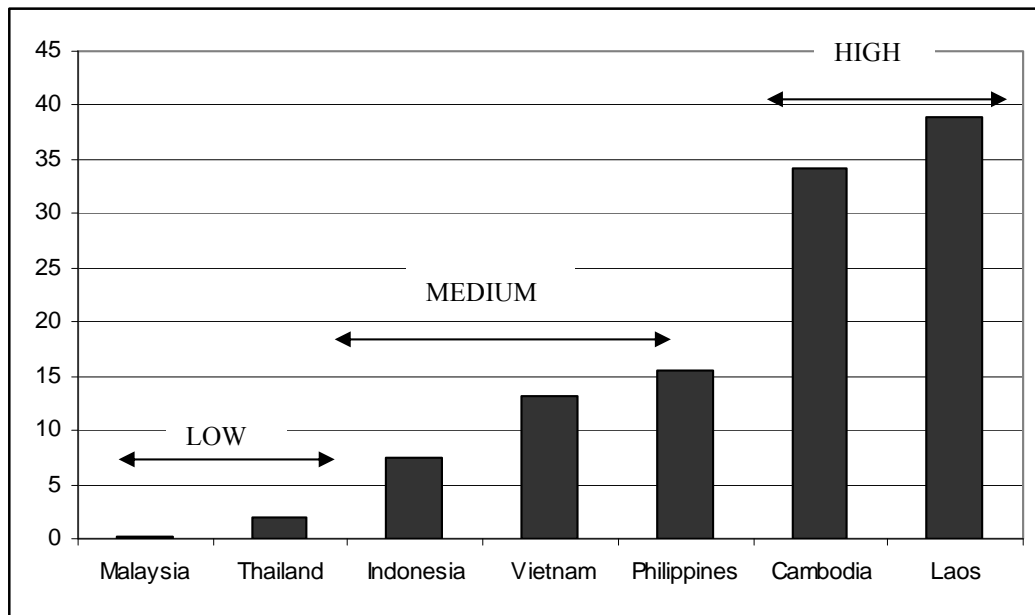


*Source:* Asian Development Bank, Key Indicators 2004

In conclusion, the income gap in ASEAN is wide and the gap has remained big despite the long integration process.
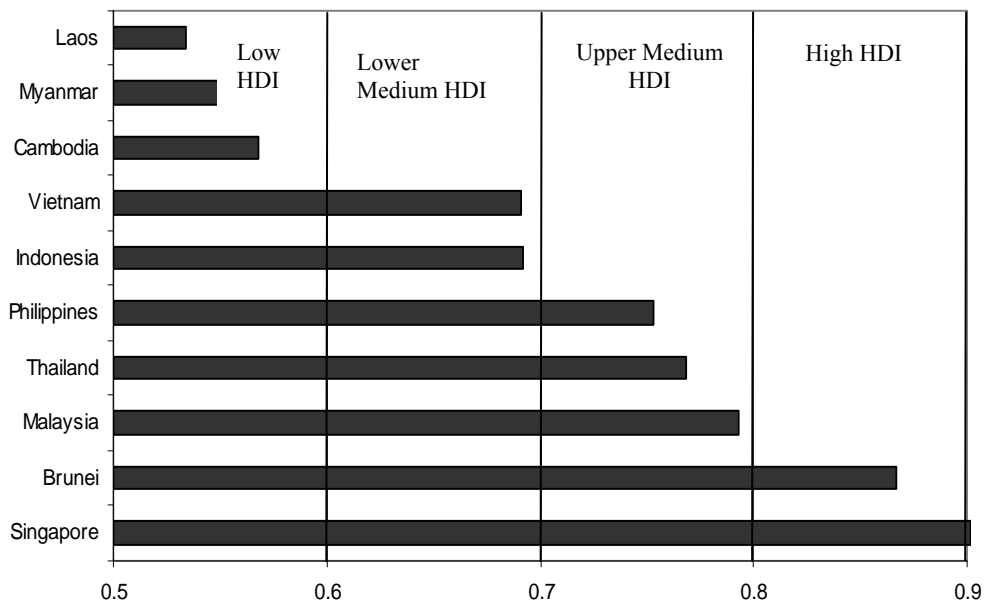
## 2.2.2 Human Development Gap

In this section the human development gap is evaluated using the human development index, life expectancy level, education and health. It is found that the HDI[8] gap between the ASEAN countries is wide but has been decreasing over the years. Figure 4 shows that in 2002, Brunei and Singapore climbed onto the category of 'high human development'. Malaysia, Thailand and the Philippines had 'upper medium human development' while Indonesia and Vietnam fell under the category of

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[8] The index ranges from 0 to 1 where higher index shows high level of human development. For discussion purposes, the index is divided into 4 categories. HDI lower than 0.6 is categorized as low, while HDI between 0.6 and 0.7 as lower medium and the range between 0.7 and 0.8 as upper medium. A HDI higher than 0.8 is considered as high human development level.

'lower medium human development'. Cambodia, Laos and Myanmar had lower HDI. That was consistent with the GDP per capita trend.

**Figure 4: Human Development Index**



Source: Human Development Report 2002

One of the important components of the human development index is life expectancy at birth. Table 3 shows the life expectancy figures for ASEAN countries. It shows that population in richer countries have longer life span than the poorer counterparts and that the life expectancy in all ASEAN-10 countries improved between the years 1997-2002. Nevertheless, the gap between the developed members and the CLMV countries in the region was wide. The gap remained significant over the years, though the difference between Singapore (longest life span) and Laos (shortest life span) had narrowed slightly from 1997 (24 years) to 2002 (21 years).

**Table 3: Life Expectancy at Birth, ASEAN-10 (1997-2002).**

| Years/ Countries | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|
| Singapore | 77.1 | 77.3 | 77.4 | 77.6 | 77.8 | 78.0 |
| Brunei | 75.5 | 75.7 | 75.7 | 75.9 | 76.1 | 76.2 |
| Malaysia | 72.0 | 72.2 | 72.2 | 72.5 | 72.8 | 73.0 |
| Thailand | 68.8 | 68.9 | 69.9 | 70.2 | 68.9 | 69.1 |
| Philippines | 68.3 | 68.6 | 69.0 | 69.3 | 69.5 | 69.8 |
| Indonesia | 65.1 | 65.6 | 65.8 | 66.2 | 66.2 | 66.6 |
| Vietnam | 67.4 | 67.8 | 67.8 | 68.2 | 68.6 | 69.0 |
| Myanmar | 60.1 | 60.6 | 56.0 | 56.0 | 57.0 | 57.2 |
| Laos | 53.2 | 53.7 | 53.1 | 53.3 | 53.9 | 54.3 |
| Cambodia | 53.4 | 53.5 | 56.4 | 56.4 | 57.4 | 57.4 |

*Source:* Human Development Report (various issues).

Life expectancy is a proxy for the overall health of people and it is evident that the mortality rate is inversely related to economic growth and overall health services in the country. There is a wide disparity in the healthcare expenditure and provision in the ASEAN countries as shown in Table 4. The USA and the EU are included as two benchmarks. Countries that have better healthcare provision are found to have longer life expectancy. A good reference would be Vietnam. Even though the per capita GDP is low in Vietnam, the life expectancy level is much better than the other CLMV countries. The contributing factor most probably is good health care provision in the country.

**Table 4: Healthcare Expenditure and Facilities**

| | Public Healthcare Expenditure, 2003 | | Physicians per 10,000 people | | Hospital Beds per 10,000 people | |
|---|---|---|---|---|---|---|
| | % GDP | % Total Health Expenditure | 1990 | 1997-2004 | 1990 | 2000-2003 |
| Brunei | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Cambodia | 2.1 | 19.3 | 1 | 2 | 21 | 5 |
| Indonesia | 1.1 | 35.9 | 1 | 1 | 7 | n.a. |
| Laos | 1.2 | 38.5 | 2 | n.a. | 26 | 12 |
| Malaysia | 2.2 | 58.2 | 4 | 7 | 21 | 19 |
| Myanmar | 0.5 | 19.4 | 1 | 4 | 6 | 6 |
| Philippines | 1.4 | 43.7 | 1 | 12 | 14 | 10 |
| Singapore | 1.6 | 36.1 | 13 | 14 | 36 | 29 |
| Thailand | 2.0 | 61.6 | 2 | 4 | 16 | n.a. |
| Vietnam | 1.5 | 27.8 | 4 | 5 | 38 | 24 |
| USA | 6.8 | 44.6 | 24 | 23 | 49 | 33 |
| EU | 6.7 | 74.1 | 31 | 39 | 81 | 66 |

Source: World Bank Development Indicators, 2006

Cambodia, Laos, Indonesia and Myanmar are far more deficient in healthcare provision in terms of number of hospital beds available and number of physicians. As a result, life expectancy in these countries is low. The gap in healthcare provision among the ASEAN countries is significant and the potential to reduce the gap is small considering financial constraints in these countries.

Education is another important ingredient in economic development. Education stimulates economic growth by improving efficiency, productivity and governance. Table 5 shows the distribution of the percentage of literate adult in the ASEAN-10. More than 90 % of the population in Brunei, Singapore, Thailand and Philippines are able to read and write. Laos and Cambodia have the low literacy rates in the region. However, both countries showed slight improvements by 2001 whereas Laos recorded a sudden improvement in the literacy rate. The gap between the ASEAN members is wide but narrowing over years. For example, the gap between Brunei (the country with the highest literacy rate in 1998) and Laos declined from 44.6 percent in 1998 to 27.5 percent in 2002. Among the CLMV countries, Vietnam had the highest literacy rate, followed by Myanmar.

**Table 5: Adult Literacy Rate, ASEAN-10 (1997-2002)**

| Years/ Countries | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|
| Singapore | 91.4 | 91.8 | 92.1 | 92.3 | 92.5 | 92.5 |
| Brunei | 90.1 | 90.7 | 91.0 | 91.5 | 91.6 | 93.9 |
| Malaysia | 85.7 | 86.4 | 87.0 | 87.5 | 87.9 | 88.7 |
| Thailand | 94.7 | 95.0 | 95.3 | 95.5 | 95.7 | 92.6 |
| Philippines | 94.6 | 94.8 | 95.1 | 95.3 | 95.1 | 92.6 |
| Indonesia | 85.0 | 85.7 | 86.3 | 86.9 | 87.3 | 87.9 |
| Vietnam | 91.9 | 92.9 | 93.1 | 93.4 | 92.7 | 90.3 |
| Myanmar | 83.6 | 84.1 | 84.4 | 84.7 | 85.0 | 85.3 |
| Laos | 58.6 | 46.1 | 47.3 | 48.7 | 65.6 | 66.4 |
| Cambodia | 66.0 | 65.0 | 68.2 | 67.8 | 68.7 | 69.4 |

*Source:* Human Development Report (various issues).

## 2.2.3 The Digital Gap

Disparity in access to and use of information technology in the region is another cause of concern. In the information age, disparity in information technology leads to widening of developmental gap where those who are well advanced in the ICT tend to grow faster and leap forward further ahead compared to those who are backward in information technology. Table 6 shows the figures on the access and usage of information technology in the ASEAN countries. The digital divide among the ASEAN members is large and transparent. In Singapore, 62 per cent of the population own a personal computer compared to 15 per cent in Malaysia, 4 per cent in Thailand, 1 per cent in Vietnam, 0.2 and 0.3 per cent in Cambodia and Laos. The CLMV countries are obviously left laggard far behind. Similarly, 50 per cent and 34 per cent of the Singaporeans and the Malaysians respectively use internet facilities. This is far in contrast to 0.2 per cent in Cambodia and Laos and 0.05 per cent in Myanmar.

**Table 6: ICT Penetration Level in ASEAN-10, 1999 and 2003**

|  | PCs per 100 people | | Internet Users per 10,000 people | |
|---|---|---|---|---|
|  | 1999 | 2003 | 1999 | 2003 |
| Brunei | n.a. | 7.67 | 317.46 | 1023.39 |
| Cambodia | 0.09 | 0.2 | 0.67 | 21.76 |
| Indonesia | 0.82 | 1.19 | 14.54 | 377.16 |
| Laos | n.a. | 0.33 | Negligible | 27.11 |
| Malaysia | 5.98 | 14.68 | 367.82 | 3456.31 |
| Myanmar | n.a. | 0.51 | n.a. | 5.64 |
| Philippines | 1.51 | 2.77 | 20.56 | 440.38 |
| Singapore | 45.84 | 62.2 | 2945.92 | 5043.59 |
| Thailand | 2.16 | 3.98 | 33.17 | 964.53 |
| Vietnam | 0.64 | 0.98 | 1.29 | 430.1 |

*Source*: Extracted from Habito, Aldaba and Templo (2004:76), Table V-1

However, the good news is that there are evidences showing that the gap is shrinking (Aseanone, 2005). Table 7 shows the five-year compound annual growth rates in ICT penetration in the ASEAN countries.

**Table 7: Avearge Growth Rates of ICT Penetration in ASEAN, 1999-2003**

| Countries | Fixed Lines | Mobile Phones | Internet Users | Computers |
|---|---|---|---|---|
| Vietnam | 15.08  (1) | 51.66 (2) | 102.26 (2) | 9.06 (6) |
| Laos | 10.17  (2) | 33.03 (6) | 47.32 (5) | 7.08 (8) |
| Indonesia | 5.89    (3) | 51.92 (1) | 53.70 (3) | 5.18 (9) |
| Myanmar | 4.33    (4) | 31.95 (7) | 116.35 (1) | 38.23 (1) |
| Thailand | 3.93    (5) | 46.19 (4) | 34.79 (6) | 11.55 (4) |
| Cambodia | 2.48    (6) | 36.98 (5) | 50.00 (4) | 13.55 (2) |
| Philippines | 1.21    (7) | 47.73 (3) | 24.64 (7) | 10.36 (5) |
| Brunei | 0.78    (8) | 14.32 (10) | 5.68 (10) | 4.31 (10) |
| Singapore | -1.06   (9) | 15.61 (9) | 16.17 (9) | 7.65 (7) |
| Malaysia | -2.20  (10) | 26.40 (8) | 21.91 (8) | 12.23 (3) |
| ASEAN Average | 3.92 | 41.12 | 33.15 | 9.83 |

*Source:* Aseanone (2005), Table 1

Aseanone (2005) reported that the growth in ICT penetration in low income countries was generally higher than the higher income ones like Singapore, Brunei and Malaysia. This is not surprising because the low

income countries started with very low level of ICT penetration level as shown in Table 7. Notable trend is observed in the expansion of fixed lines, mobile phones and internet use. The most striking is the growth of internet users in Vietnam and Myanmar which exceeded 100 per cent. These figures indicate narrowing of digital divide in the ASEAN countries, though the gap is still wide.

Linked directly to the digital divide is the telecommunication service. The telecommunications facilities are important in eliminating problems related to distance and thus act as a crucial tool for enhancing development and narrowing the disparity between cities and rural areas. Telephones provide major benefits in improving economic productivity and quality of life (Bruns, 1992). According to Bruns, telephone telecommunications can help businesses and government agencies to provide better services, and deliver goods and services quickly in response to local needs. Good telecommunication services also allow people in rural areas to keep in touch with friends and relatives elsewhere and quickly call for help in emergencies. Bruns also argued that telephone services give farmers and other rural businesses better access to timely, specialized information about markets, leading to better decisions and enabling businesses to locate in rural areas while still being competitive in the global economy. Thus, by all means, telephones lead to development. Therefore, to explain the development gap in this sense, Table 8 displays the main telephone lines in operation in the ASEAN-10 member countries over the years 1995-2002.

**Table 8: Number of Telephone Lines in Operation, ASEAN-10 (1995-2002)**

| Years/ Countries | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|
| Singapore | 1429 | 1563 | 1685 | 1778 | 1877 | 1947 | 1948 | 1927 |
| Brunei | 68 | 79 | 77 | 78 | 79 | 81 | 88 | 90 |
| Malaysia | 3332 | 3771 | 4223 | 4384 | 4431 | 4634 | 4710 | 4670 |
| Thailand | 3482 | 4200 | 4827 | 5038 | 5216 | 5591 | 6049 | 6500 |
| Philippines | 1410 | 1787 | 2078 | 2492 | 2892 | 3061 | 3315 | 3311 |
| Indonesia | 3291 | 4186 | 4982 | 5572 | 6080 | 6663 | 7219 | 7750 |
| Vietnam | 775 | 1186 | 1333 | 1744 | 2106 | 2543 | 3050 | 3929 |
| Myanmar | 158 | 179 | 214 | 229 | 249 | 271 | 295 | 342 |
| Laos | 17 | 19 | 25 | 28 | 35 | 41 | 53 | 62 |
| Cambodia | 9 | 15 | 20 | 24 | 28 | 31 | 33 | 35 |

*Source:* United Nations, Statistical Year Book (various issues).

It is found that the number of telephone lines is increasing in all of the ASEAN-10 member countries, with the highest number recorded in Indonesia in the year 2002. Despite this increase, the gap between the countries having the most telephone lines (Thailand) with the one having the least (Cambodia) was still 3,473 and 7,715 telephone lines in 1995 and 2002 respectively. Between the CLMV countries the gap is also huge, with Vietnam having the greatest number of lines among all ASEAN member countries.

## 2. DID THE INCOME GAP CONVERGE?

This section examines the trend of GDP per capita for ASEAN-10 over the period 1970-2003. The logarithms of GDP per capita are plotted against the specified years to observe whether the income gap between the ASEAN countries has decreased (convergence) or increased (divergence). Figure 5 presents the logarithms of GDP per capita (LnGDP) for the ASEAN-6 (Singapore, Brunei, Malaysia, Thailand, Indonesia and the Philippines) over the period 1970-1995. All the LnGDP series are trending upwards, without any sign of structural change in any of the series. It shows that the income gap between Singapore and Brunei was decreasing from 1970 onwards and it was completely closed in 1992. After 1992, Singapore took the lead for all ASEAN-6 including Brunei. The income gap between Singapore and each of the other four ASEAN member countries namely; Malaysia, Thailand, Indonesia and Philippines has been the same throughout the time period with the exception of Malaysia which showed a slight change towards the 1990s. There were some fluctuations in the GDP per capita of both Indonesia and the Philippines during the 1980s and the early 1990s. As a result of these fluctuations, the gap between Singapore and each of these two countries actually widened. The gap between Indonesia and Philippines started to narrow during the 1980s until it was nearly closed in the last three years (1993, 1994 and 1995). However, if we exclude the two highest income members (Singapore and Brunei), and compare the income gap between Malaysia and each of Indonesia, Thailand and the Philippines, we can see from Figure 5 that the income gap between Malaysia and Thailand has declined over the years. The gap between Malaysia and Indonesia remained the same throughout the years. However, the gap between the Philippines and Malaysia has actually increased compared to the one with Thailand.

**Figure 5**

Logarithms of GDP per capita for ASEAN-6,1970-1995.
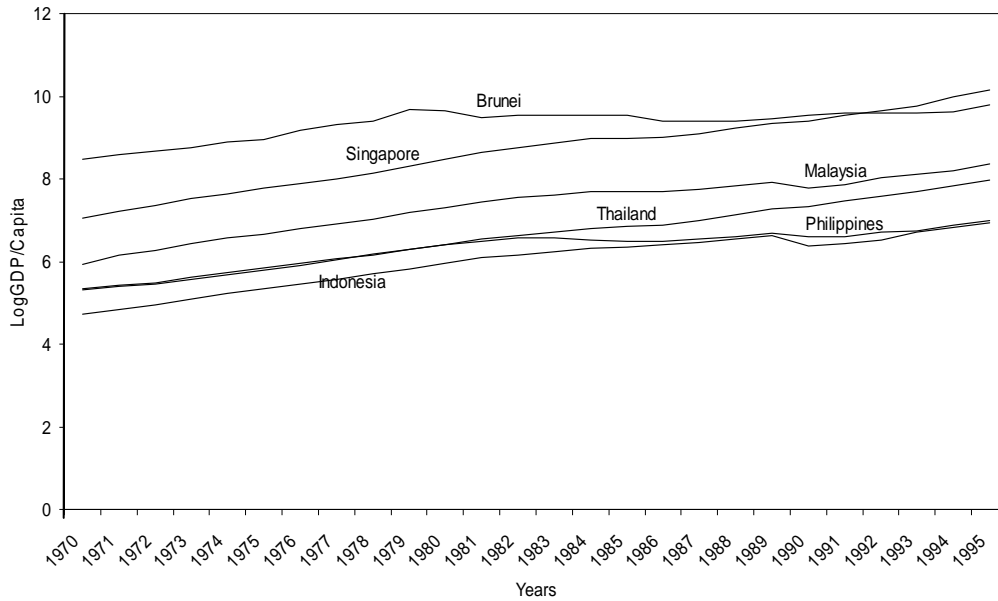


The development gap between the ASEAN-6 and the CLMV countries can also be shown over the period before and after the enlargement process. Using the same data, Figure 6 plots the logarithms of GDP per capita (LnGDP) for the CLMV countries together with the ASEAN-6 over 1970-2003 period. It is evident from Figure 6 that the LnGDP series for the old ASEAN member countries (ASEAN-6) were trending upwards prior to the crisis period (1997-1998). Throughout the period, the individual levels of LnGDP of the old ASEAN countries were parallel to each other, while those of the CLMV countries were neither parallel to each other nor to the ASEAN-6. Instead, the LnGDP series for the CLMV countries overlapped over the period 1970-1980. Apparently, the income gap between each of the CLMV countries and the highest income country in the Association (Singapore) was big and remained high during the 30-year period.

**Figure 6**

Logarithms of GDP per capita for ASEAN-10,1970-2003.
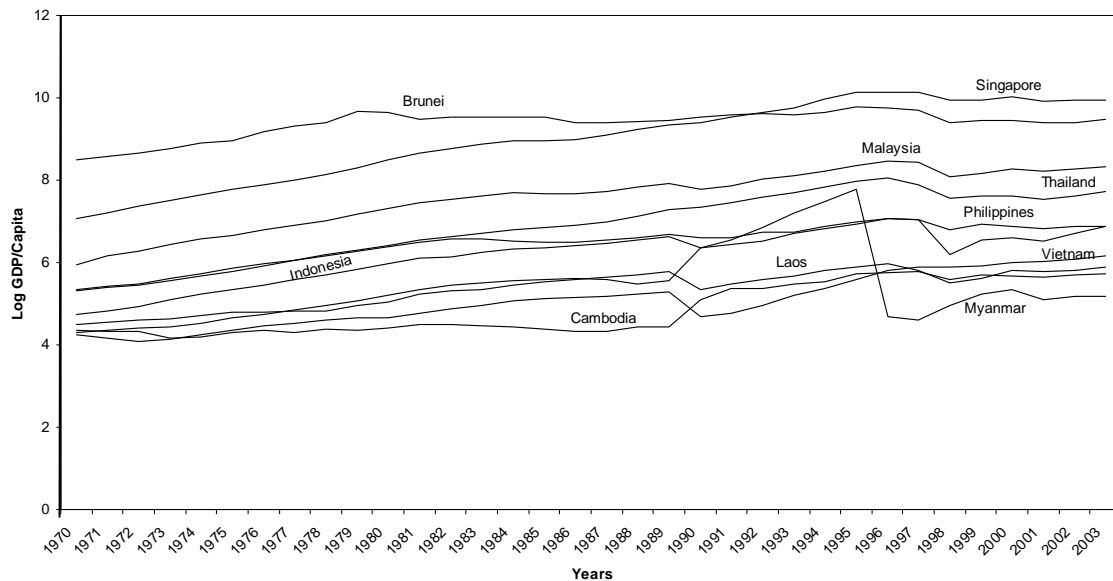


A drop in the LnGDP series of Cambodia from the early 1980s up to the early 1990s[9] opened up a big income gap between the country and the other three CLMV countries as well as the ASEAN-6. The income gap between Cambodia and the other member countries was reduced from the mid-1990s onwards. It is clearer in Figure 7 that Cambodia and Laos were almost closing the gap over the period 1995-2003. Despite the slight fluctuations shown by Vietnam's income levels in the early 1990s, the country still maintained a steady level of income until it overtook the other members in the CLMV group.

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[9] During this period Cambodia was not yet a member of ASEAN.

**Figure 7**

**Logarithms of GDP/Capita for the CLMV countries,1970-2003.**
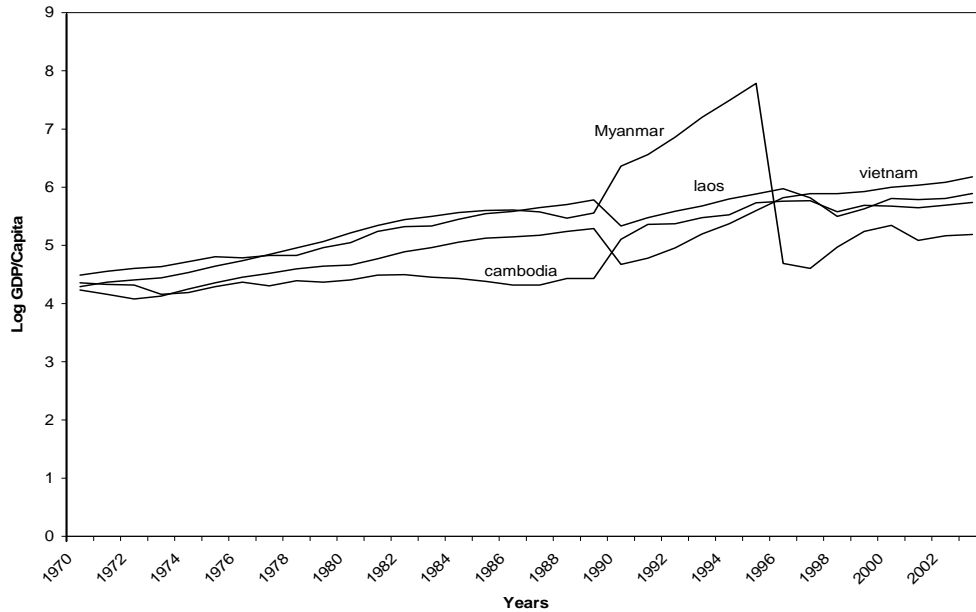


Interestingly, we can see from Figure 7 above that Myanmar grew faster in the early nineties to reduce the income gap with four of the old ASEAN members (Singapore, Thailand, Malaysia and Brunei). Myanmar's growth performance was very high during that period and showed a very sharp increase from the beginning of the 1990s until 1996. At one point, Myanmar's GDP per capita almost coincided with that of Thailand and thus eliminating income gap between them, while at the same time reducing the income gaps between itself and Singapore and Indonesia. According to the country's commercial guides in 1999, the reason for this income increase was that the government of Myanmar had partially liberalized its economic activity and reduced obstacles to foreign trade and investment. The dramatic drop in the income level is because the country's economic growth has declined since the year 1994.

**Figure 8**

logarithms of GDP per capita for ASEAN-6 and CLMV, 1995-2003.
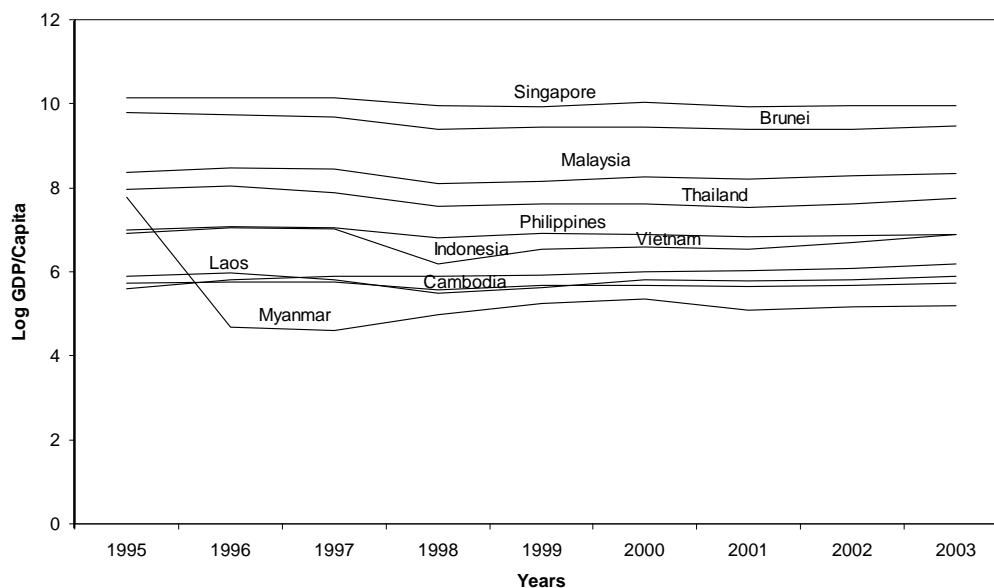


## 4. EMPIRICAL TESTING

This section empirically examines income convergence among the ASEAN-10 member countries over the period 1970-2003. The Lim and McAleer (2000) approach[10] will purposely be used in this paper. Two benchmarks are being used in this study, which are Singapore's income levels and the average income levels of the ASEAN-6 countries. The former is used to test whether there is any convergence in income levels between Singapore and each of ASEAN member countries. Meanwhile, the average income levels of the six ASEAN member countries are used to test whether the income level of the CLMV countries converge to that of the old members. According to Lim and McAleer, convergence in multivariate output is given by the following equation:

$$\lim_{k \Rightarrow \infty} E(y_{1,t+k} - y_{i,t+k} \setminus I_t) = 0, \qquad \forall i > 1 \qquad (1)$$

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[10] This study differs from that of Lim and McAleer in terms of number of countries included in the study and the time period. Lim and McAleer studied ASEAN-5 over 1968 to 1992 period. Meanwhile, this study incorporates ten ASEAN member countries and uses a longer time period (1970-2003).

Equation (1) defines convergence in multivariate output such that the long-term forecasts of output for all countries, i= 1,……, n, are equal at a fixed time where, $y_{i,t+k}$ is the logarithm of real per capita output for country i at time t+k, and $I_t$ is all the information available at time t.

With the application of the unit roots and cointegration concepts, the convergence test thus determines whether $(y_{1,t+k} - y_{i,t+k})$ in equation (1) is a zero mean stationary process in a cointegration framework. To converge towards each other, the outputs in two countries must be cointegrated with a cointegrating vector of $[1,-1]$. This follows that the two countries must have a common time trend if their output series are trend stationary. Non-converging countries may still experience the same permanent shocks, but will differ in their long-run magnitude across countries. Thus to allow for permanent shocks to have different long-run weights, the following tests are proposed,[11]

For multivariate output, countries j = 1, 2, ……, n are defined to contain a single common trend if the long-term forecasts of output are proportional at a fixed time t.

$$\lim_{k \Rightarrow \infty} E(y_{1,t+k} - \alpha'_j y_{j,t+k} \setminus I_t) = 0, \qquad \forall \ j > 1, \qquad (2)$$

where $\acute{\alpha}_j$ is the vector of long-run weights for countries j = 2,3,…, n. Thus two countries are said to have a common trend if their output series are cointegrated with vector $[1,-\alpha]$. Cointegration is used for the study of non-stationary time-series, particularly a non-stationary vector autoregressive (VAR) process integrated of order one (i.e. an I(1) series). Testing for convergence and common trends in a cointegration framework requires the individual output series to be integrated of order one. The Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests are used to determine the order of integration of the GDP per capita of the ASEAN-10 countries.

Meanwhile, the rank of the cointegrating matrix in a multivariate framework is estimated by writing the output vector process in the following VAR representation.

$$Y_t = \Delta_1 Y_{t-1} + \ldots\ldots\ldots + A_k Y_{t-k} + \varepsilon_t \qquad \qquad \varepsilon_t \sim IN(0 \ \varepsilon) \qquad (3)$$

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[11] These tests were proposed by Bernard and Durlauf (1995).

this VAR model offers us a way to estimate dynamic relationship among jointly endogenous variables without imposing strong a priori restrictions. Therefore, Equation (3) can be reformulated into a vector error correction (VECM) representation.

$$\Delta Y_t = \Gamma(L)\Delta Y_t + \Pi Y_{t-k} + \mu + \varepsilon_t, \qquad (4)$$

where $Y_t$ is a vector of the logarithms of real GDP per capita for the ASEAN-10 countries, $\Pi$ represents the long-run relationships of the cointegrating vectors, $\Gamma(L)$ ( a polynomial of order k-1) captures the short-run dynamics of the system, and $\varepsilon_t$ are the independent Gaussian errors with zero mean and covariance matrix $\Omega$.

The reduced rank (0<rank ($\Pi$) = r<n) of the long-run impact matrix can be formulated as,

$$\Pi = \alpha \; \beta', \qquad (5)$$

where $\beta$ is the matrix of cointegrating vectors and $\alpha$ is the matrix of adjustment coefficients.

Johansen (1991) has proposed two likelihood ratio test statistics to test the reduced rank $\Pi$ for cointegration; the trace and the maximal eigenvalue statistics of the stochastic matrix $\Pi$. The trace statistic for testing $H_0$ (r) against $H_1$ (unrestricted) is given by:

$$J_{trace} = \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}), \qquad (6)$$

and the maximal eigenvalue statistic for testing $H_0$ (r) against $H_1$ (r+1) is given by:

$$J_{max} = -T \ln(1 - \hat{\lambda}). \qquad (7)$$

### 4.1. The Test

Convergence is tested between three groups of countries; (i) between Singapore[12] and each of CLMV countries (Cambodia, Laos, Myanmar and Vietnam) [13]; (ii) between each of CLMV countries and the average

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[12]Being the richest economy in the region, maintaining a high growth rate, low inflation rate and unemployment rate among the rest of the ASEAN member countries, Singapore is used as the benchmark to represent the standard of the ASEAN-10.

[13] Lim and McAleer (2000) used Singapore as a benchmark to examine convergence among five ASEAN countries (Singapore, Malaysia, Indonesia, the Philippines and Thailand).

income level of ASEAN-6 countries[14]; (iii) between Singapore and each of ASEAN-6 countries.

Before testing for convergence, we have to test for the stationarity of the series, and that is done by determining the order of integration for each of the output series. A stationary time series is one whose statistical properties such as mean, variance, autocorrelation and so forth are constant over time. In this study the ADF and PP tests are used to test for the presence of unit roots in the logarithms of GDP per capita (LnGDP) series. The proper lag length for our data series is determined by using the Akiake Information Criterion (AIC)[15]. The number of lags used is the one that gives the minimum AIC of all. Table 9 presents the estimated t-statistics[16] and the critical values for both the ADF and PP tests, in trend and intercept in levels over the estimated period. The tests result shows that the null hypothesis of unit root is not rejected in level for the 11 LnGDP series, indicating that they are non-stationary. By taking first differences of the series, the test result from

**Table 9: Estimated t-statistics for ADF and PP Tests for Non-Stationarity in levels**
**(Singapore, ASEAN-6, Av-6 and CLMV (1970- 2003))**

| Variable | ADF t-value | PP t-value |
|---|---|---|
| Av-6LnGDP | -1.65549(1) | -1.3185(1) |
| SinLnGDP | 0.26922(9) | 0.0379(2) |
| BrLnGDP | -1.9427(0) | -1.9427(0) |
| MsyLnGDP | -1.7825(0) | -1.7614(3) |
| ThaiLnGDP | -1.3804(0) | -1.3667(0) |
| PhilLnGDP | -1.3804(0) | -1.3804(0) |
| IndLnGDP | -2.0782(0) | -2.0782(0) |
| MynLnGDP | -2.0309(0) | -2.1261(2) |
| CamLnGDP | -2.1228(1) | -2.0526(2) |
| LaosLnGDP | -2.0496(0) | -2.0258(3) |
| VietLnGDP | -2.5800(1) | -2.3543(1) |

[14]In a similar study, Bosworth and Kollintzas (2001), tested for convergence between Greece and the average of the EU13.

[15] The AIC is used to test the adequacy of econometric models and compare them for forecasting purposes.

[16]We look only at the absolute value of the estimated t-statistics.

LnGDP=LogGDP; Av-6=average, ASEAN-6, Sin=Singapore, Br=Brunei,
Msy=Malaysia, Thai=Thailand, Phil=Philippines, Ind=Indonesia,
Myn=Myanmar, Cam=Cambodia, Laos=Laos, Viet=Vietnam.
The values in brackets denote maximum lag length used in ADF test, and the bandwidth in PP test.
* indicates significance at the 5% level.

Table 10 indicates that all the 11 LnGDP series are integrated of order one. The Johansen method is therefore used to test for the presence of cointegrating vectors or common trend.

**Table 10: Estimated t-statistics for ADF and PP Tests for Non-Stationarity in First Differences**
**(Singapore, ASEAN-6, Av-6 and CLMV (1970- 2003))**

| Variable | ADF t-value | PP t-value |
|---|---|---|
| Av-6DLnGDP | -4.4028*(0) | -4.4028*(0) |
| SinDLnGDP | -4.5938*(8) | -3.9069*(2) |
| BrDLnGDP | -4.7584*(0) | -4.7584*(0) |
| MsyDLnGDP | -4.8283*(1) | -5.5753*(1) |
| ThaiDLnGDP | -3.6215*(0) | -3.6215*(0) |
| PhilDLnGDP | -5.1259*(0) | -5.1259*(0) |
| IndDLnGDP | -6.4491*(0) | -6.4491*(0) |
| MynDLnGDP | -5.4350*(0) | -6.4431*(9) |
| CamDLnGDP | -4.5493*(0) | -4.5493*(0) |
| LaosDLnGDP | -5.4809*(0) | -6.9276*(11) |
| VietDLnGDP | -4.6595*(0) | -4.5985*(4) |

DlnGDP denotes the first difference of LnGDP.
The values in brackets denote maximum lag length used in ADF test, and the
bandwidth in PP tests.
* indicates significance at 5% level.

## 4.2. Cointegration Test (Johansen Method)

Having all series integrated of order one i.e. I (1), the Johansen multivariate cointegration method (1991) is then used to test for the presence of cointegration among the variables to test whether there is convergence between Singapore and each of the CLMV countries (Cambodia, Laos, Myanmar and Vietnam) first. Before conducting the

cointegration test, the number of lags to be used should also be determined. This is done by using the VAR specification technique in E-views (see Gujarati, 2001). According to Gujarati (2001), too many lagged terms will consume degrees of freedom and introduce the possibility of multicollinearity, while including too few lags will lead to specification errors. Thus, one way of deciding how many lags to include is to use the Akaike Information Criterion (AIC) and choose the model that gives the lowest values of this criterion. Using the correct lags, and by allowing for linear deterministic trend in the data, the trace and maximal eigenvalue statistics of the stochastic matrix determine the number of cointegrating vectors(r).

Table 11 reports the trace and the maximal eigenvalue statistics of the stochastic matrix that determine the number of the cointegrating vectors(r), and the LR restriction test on the cointegrating vector. Both the trace statistics and the maximal eigenvalue reject the null hypothesis of no cointegrating relationship between Singapore and Myanmar. Although, the test statistics yield the correct inference, the LR test of a unit restriction on the corresponding cointegrating vector is rejected. This indicates that there is no income convergence between Singapore and Myanmar. Meanwhile, the trace and the maximal eigenvalue statistics fail to reject the null hypothesis of no cointegration between Singapore and each of Cambodia, Laos and Vietnam. This implies that there is no income convergence between Singapore and each of the three countries.

**Table 11: Maximal Eigenvalue and Trace Statistics Result**
**(Singapore and CLMV)**

| Hypothesis | Variables | Max. Eigen-value | 5% critical value | Trace Statistics | 5% critical value | LR Test for [1,-1] vector |
|---|---|---|---|---|---|---|
| H0: r = 0  Ha: r ≤ 1 | **SinLnGDP** CamlnGDP MynlnGDP LaoslnGDP VietlnGDP | 9.582 23.486* 7.459 10.476 | 14.07 | 13.017 27.739* 13.108 14.233 | 15.41 | – 19.189 – – |

* denotes rejection of the null hypothesis at 5% level.

Table 12 shows that the trace and the maximal eigenvalue statistics do not reject the null hypothesis of no cointegration between AV-6 (average GDP per capita for the ASEAN-6) and three of the CLMV countries, namely, Cambodia, Laos and Vietnam. This implies that the three countries' income levels do not converge towards that of average ASEAN-6. On the other hand, while both trace and the maximal eigen-value statistics indicate long-run cointegrating relationship between Av-6 and Myanmar, the LR test rejects the unit restriction and therefore, no income convergence exists between the corresponding cointegrating vectors.

**Table 12: Maximal Eigenvalue and Trace Statistics Result**
**(Av-6 and CLMV)**

| Hypothesis | Variables | Max. Eigen-value | 5% critical level | Trace Statistics | 5% critical level | LR Test for [1,-1] vector |
|---|---|---|---|---|---|---|
| H0: r = 0 H1: r ≤ 1 | **Av-6LnGDP** CamlnGDP MynlnGDP LaoslnGDP VietlnGDP | 11.424 14.757* 7.061 7.381 | 14.07 | 13.054 19.597* 13.342 11.446 | 15.41 | – 9.806 – – |

* denotes rejection of the null hypothesis at 5% level.

Table 13 shows that both the trace and the maximal eigenvalue statistics do not indicate any cointegrating relationship between Singapore and Brunei, Malaysia, Philippines and Indonesia. Meanwhile, only the trace statistics rejects the null hypothesis of no cointegration between Singapore and Thailand. However, the unit restriction result reveals that there exists no income convergence between the corresponding vectors. Thus, the test even suggests that neither of the old ASEAN countries' income is converging towards that of Singapore.

**Table 13: Maximal Eigenvalue and Trace Statistics Result**
**(ASEAN-6)**

| Hypothesis | Variables | Max. Eigen-value | 5% critical level | Trace Statistics | 5% critical level | LR test for [1,-1] vector |
|---|---|---|---|---|---|---|
| H0: r = 0<br>H1: r ≤ 1 | **SinLnGDPP**<br>BrLnGDP<br>MsyLnGDP<br>ThaiLnGDP<br>PhilLnGDP<br>IndLnGDP | 9.001<br>7.338<br>13.332<br>7.904<br>6.146 | 14.07 | 14.611<br>12.338<br>17.427*<br>10.541<br>10.227 | 15.41 | —<br>—<br>6.745<br>—<br>— |

* denotes rejection of the null hypothesis at 5% level.

The results above show that there is no income convergence in the long run between any of the ASEAN member countries chosen in this study.

## 5.  WHY THE GAP DID NOT REDUCE?

The above analysis show that the ASEAN countries failed to converge in terms of income and that the development gap between the members is still wide. This is worrying as mentioned earlier convergence is an essential instrument for a successful integration among countries and regions. The question therefore is why did the gap fail to narrow after so long?

The main reason was the lack of political will in ensuring effective implementation of action plans that had been drawn by the ASEAN secretariat. One success case that can be emulated in terms of convergence strategies and enforcement is that of the European Union. The EU has experienced development divergence between its members in the early years of its inception and after the enlargement process in the 1990s. However, this gap was effectively reduced with the EU's deliberate and concerted efforts to narrow the gap. One of the important policy tools used was the European structural funds[17] (Solanes and

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[17] Structural Funds are meant to target six objectives; Economic adaptation of less developed regions, Economic recovery of regions affected by the industrial crisis, Fighting long-term unemployment, Facilitating the adaptation of workers to industrial changes and to changes in the production systems, Speeding up the adjustment of agricultural structures, Regions corresponding to or belonging to regions at NUTS2

Maria-Dolores, 2001; Cuyers, 2002). The quantitative evidence provided in literature shows that structural funds policy instruments have had positive effects on GDP levels in the region. According to Solanes and Maria-Dolores (2001), the EU structural assistance has expanded the GDP growth, on average, by 0.4 to 0.9 percentage points in Greece, Portugal and Ireland, and by 0.3 to 0.6 percentage points in Spain. In addition, the structural and cohesion funds provided support to various development projects in poorer member states with GDP below 90 per cent of the community average[18]. Furthermore, the European Investment Fund financed long-term projects related to the Trans-European Transport Network and development of small and medium size firms. The convergence criteria for the euro-zone have also facilitated in narrowing the income gap and other macroeconomic variables in the EU.

The ASEAN also had similar vision and action plans to reduce the gap among its members. The Initiative for the ASEAN Integration (IAI) was launched in 2000 with the aim to narrow the developmental gap between the ASEAN-6 and the CLMV countries. The programme focuses on a few priority areas in infrastructure development, human resource development, information and communications technology and promoting regional economic integration in the CLMV countries[19]. However, the major problem is funding. The ASEAN projects are mostly funded by external development funding agencies which are usually not disbursed after ambitious pledges were made. Thus many projects and programmes failed to materialize in the ASEAN. Poorer ASEAN members are in dire need for substantial financial and technical support in the areas of healthcare, education, transportation, telecommunication, banking and finance, administration as well foreign direct investment to foster their development. Lack of political will to ensure all the action plans and strategies were implemented accordingly is one of the serious problems plaguing the ASEAN.

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level with a population density of eight inhabitants per Km2 or less (Boldrin and Canova, 2000).

[18] The Cohesion Fund provides financial support to two kinds of large, public or private investment projects; Environmental projects that contribute up to 80–85 percent of total public expenditure.

[19] www.aseansec.org.

Another primary reason for the delay in convergence process is divergence in the political ideology and political unrest that exist in the ASEAN. Both the ASEAN and the EU experienced this problem since their members have had different political regimes and ideologies over the past few decades. However, the EU was able to manage this problem better than the ASEAN due to its administrative and political strength. In conclusion, diversity in political orientation, lack of internal funding for development as well as the lack of political will in ensuring commitments are fulfilled have contributed to the failure of narrowing the developmental gaps in the ASEAN. This consequently has negative impact on the progress and process of economic integration.

## 5.  CONCLUDING REMARKS

In this paper, the presence of the wide developmental gap between the rich and prosperous countries in the ASEAN and the weaker ones has been shown. Between 1970 and 2003, the gap between Singapore, Brunei and Malaysia with Indonesia and Philippines slightly narrowed, but the gap persisted. With the inclusion of new members, the gap widened further, especially between the rich two (Singapore and Brunei) and the poorer nations such as Myanmar and Laos. Observation on the ASEAN-10's GDP per capita trend over the period 1970-2003 showed insignificant level of income convergence. The same finding was noted for the ASEAN-6 and the CLMV countries. This is supported by long-run cointegration test which has found no evidence of income convergence between any of the ASEAN countries.

This is in contrast to the EU, where the developmental gap was successfully narrowed. The Maastricht convergence criteria plus the EU's deliberate efforts in providing generous financial grants to weaker members helped in reducing the developmental gaps between the EU countries. Despite of the financial constraints faced by the EU after the inclusion of new members, the Union was able to achieve the convergence agenda because of its strong political will and focused target to create a competitive single nation. What the ASEAN needs, therefore, is a strong political will, a formal institutional structure to institute and carry out policies and strategies and internal financial funds to achieve the ASEAN Vision 2020.

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