Income Disparity in ASEAN 2000-2010

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Abstract

The objective of this study is to empirically examine the income disparity between countries in Southeast Asia (ASEAN) during the period of 2000 to 2010, utilizing Williamson Index as the measurement. The results suggest that income disparity between ASEAN countries is getting smaller during the observation period.

Introduction

Virtually all of the observed rise in the world's income inequality has been driven by widening gaps between nations, and almost none has been driven by widening gaps within nations (Lindert and Williamson, 2003). Every region always has both developed and developing countries (Sofiagy,2010). And so does the Southeast Asia (hereafter referred to as 'SEA' in this paper) region with its diverse economy (Bunyaratavej and Hahn, 2003; Park, 2000). There are countries with high GDP per capita and countries with low GDP per capita as shown in Table 1.

Table 1: GDP per capita at PPP (USD)

ASEAN Countries	2000	2010
Brunei Darussalam	43.265,786	48.886,098
Cambodia	917,182	2.159,070
Indonesia	2.410,298	4.410,948
Lao PDR	1.179,972	2.355,081
Malaysia	9.019,820	14.770,788
Myanmar	529,722	1.950,225
Philippines	2.472,624	3.922,942
Singapore	33.172,237	56.569,967
Thailand	4.944,218	8.747,938
Viet Nam	1.415,731	3.193,064
Average	**9.932,759**	**14.696,612**
Average*	**2.861,196**	**5.188,757**

* without Brunei Darussalam dan Singapore
sumber: ADB Key Indicators for Asia and the Pacific 2011

The income gap between countries in the SEA region is still wide from the early year of observations to the end of the year observations. The country with highest GDP per capita in this region is Brunei Darussalam with a range of GDP per capita above US. $ 40,000. Meanwhile country with lowest GDP per capita income is Burma with a range of GDP per capita below US. $ 2,000.

Table 1 has clearly shown the existence of income disparities between countries in SEA region during the years 2000-2010. However, regarding developing economies especially, SEA region few studies attempted it in their income disparities related empirical analysis. Therefore, the central objective of this paper is to empirically examine and analyze the income disparities in SEA countries region during the years 2000-2010. The countries included in this study are Brunei Darussalam, Singapore, Malaysia, Thailand, Philippines, Indonesia, Lao PDR, Cambodia, Viet Nam, and Burma.

The data used in this study are population and GDP per capita at PPP (Power Purchase Parity) of every country in the region of SEA during the years 2000-2010. This study utilizes the measurement method of *Weighted Coefficient Variation* or Williamson Index to obtain the income disparity values.

Literature Review

Gama (2008) analyzed regional disparity among regencies in Bali (a province in Indonesia) from 1993 up to 2006. Williamson's weighted coefficient of variation is used to measure the regional disparity in Bali. The result indicated that there was an increasing regional disparity among regencies in Bali during 1993-2006.

Lee, Lim, dan Azali (2005) empirically examine the income disparity between Japan and each of the five major economies of SEA (ASEAN−5) during the period of 1960 to 1997, utilizing the popular augmented Dickey−Fuller (ADF) unit root test. The results provide evidence of income divergence between Japan and each of the ASEAN−5 economies. To avoid the problem associated with structural break, this study proceeds with the jointly crash and changes in trend model proposed by Zivot and Andrews (1992), and is able to obtain evidence of long run income convergence between the Japanese and Singaporean economies. As for the rest of the four ASEAN countries− Indonesia, Malaysia, the Philippines and Thailand, the earlier results of income divergence remain valid and hence suggest that it would be a more realistic and urgent goal to narrow the income gap among these five core economies of ASEAN.

Park (2000) measured the disparity of income convergence that occurred in SEA region to drive economic integration in the ASEAN region. The author used secondary data, namely real GDP and population data of each ASEAN member country and grouped the data in 5-year blocks. Disparity was calculated using the Theil Index. The study found increasing disparity between countries of ASEAN during 1960-1997. Park concluded that given the presence of sharp income disparities between countries in ASEAN, it is not realistic to expect economic integration in the ASEAN region for a short or long term. While the study has the strength of a long observation period, a potentially limiting weakness was the use of the less reliable, PWT (Penn World Tables) data. In addition the formula used to calculate the disparity just by Theil Index – an index commonly used only for population data (elaborate on why Theil is bad). It would be better if disparity calculations were also done using other methods of measurement. Furthermore the study did not analyze the factors that cause the occurrence of an increasingly sharp income disparities.

Data and Source

The source of our data, population and GDP per capita at PPP (Purchase Power Parity) for ten ASEAN countries (Brunei Darussalam, Singapore, Malaysia, Thailand, Philipines, Indonesia, Lao PDR, Cambodia, Viet Nam, and Burma) was obtained from Asia Development Bank in Key Indicators for Asia and the Pacifics 2011. The unique feature of this data is that the values of all GDP per capita are denominated in a common set ot prices in a common currency so that real quantity comparisons can be made, both between countries and over time.

Williamson Index

Williamson index formulation as follows :

$$V_w = \frac{\sqrt{\sum_i \left(\overline{Y}_i - \overline{Y}\right)^2 \dfrac{n_i}{n}}}{\overline{Y}}$$

which :

V_w = *weighted coefficient of variation* or Williamson Index
n_i = total population of i (country)
n   = total population of all countries in ASEAN
$\overline{Y}_i$ = GDP per capita at PPP of i (country)
$\overline{Y}$ = average of GDP per capita at PPP of all countries in ASEAN

The range of income disparity is around 0 to 1 ($0 < V_w < 1$). The closer to 0, the lower the income disparities between countries become. Conversely, the closer to 1, the higher the income disparities between countries become.

To obtain more detailed results, we performed the calculation in six groups. The first group consists of ten countries defined before. The second group consists of all datas from countries defined before except Brunei Darussalam and Singapore. The third group consists of Cambodia, Lao PDR, Burma, and Viet Nam. The fourth group consists of Indonesia, Philippines, and Thailand. While the fifth group consists of Brunei Darussalam, Singapore, and Malaysia, the sixth group consists of Malaysia and Thailand. These classifications are based on the economic backgrounds of each country particularly the level of GDP per capita at PPP from the early year of observations, the year of 2000. Its aim is to obtain more detailed conditions in income disparities between countries in SEA region.

Datas from Table 2 showed GDP per capita at PPP in ten countries in SEA region during the years 2000-2010. the country with lowest GDP per capita at PPP in this region is Burma with the average around US. $ 1,136.479. The highest is Brunei Darussalam with the average around US. $ 47,356.5 followed by Singapore with the average around US. $ 44,008.8. Both Brunei Darussalam and Singapore are considered developed country in SEA region with much higher GDP per capita at PPP compared to other countries in this region (figure 1). If both countries's GDP per capita at PPP are included in the calculation of average GDP per capita at PPP, the results are quite different compared to the average GDP per capita at PPP which does not include these two countries (figure 2).

By using the formula of Williamson Index, we obtained the results as listed in Table 3. A higher achievement of Brunei Darussalam and Singapore against other countries in SEA region made the income disparities occured in this region was enormous. If the data of Brunei Darussalam and Singapore were excluded from the calculation, the results obtained would be that the level of income disparities between countries in this region were smaller. The difference between inclusion and exclusion Brunei Darussalam and Singapore in the calculation was tangible at the year 2010 which was equal to 0.216. However, the results of both calculations showed a decrease in the level of disparity from 2000 until 2010.

Figure 1
GDP per capita at PPP in ASEAN 2000-2010
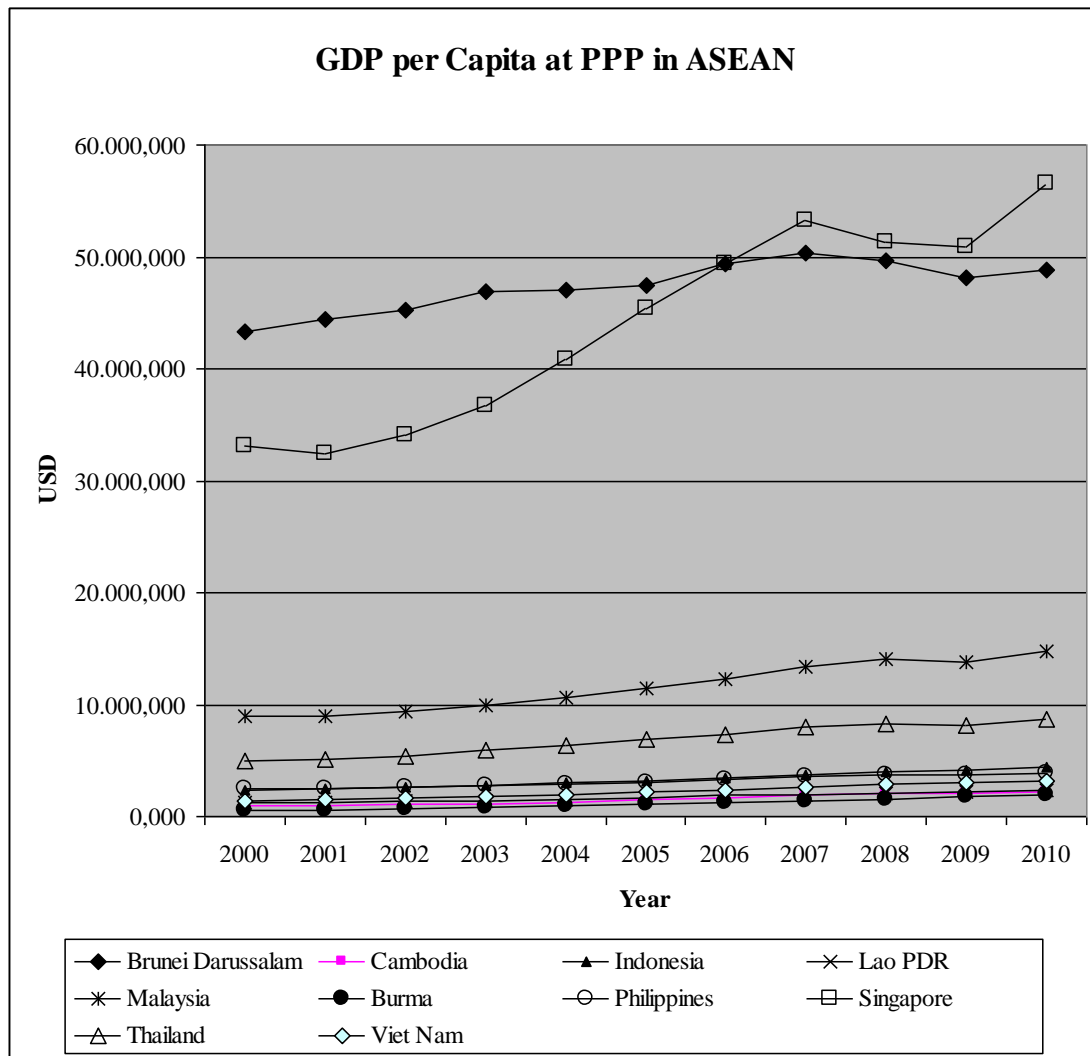
source: ADB Key Indicators for Asia and the Pacific 2011

Each group's results are shown in Table 4. Almost every group's results are relatively small which are below 0.5 except for the first and fourth groups that include Brunei Darussalam and Singapore in their calculations. In the next section, we will discuss each group in more details.

Tabel 2: GDP per Capita at PPP 2000-2010

Negara ASEAN	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Brunei Darussalam	43265,8	44368	45283,5	46867,6	47079,1	47465,1	49440,9	50381,6	49622,8	48151	48886,1
Singapore	33172,2	32442,5	34102,5	36706,9	40772,9	45374,2	49418,9	53285,5	51312,5	50938,7	56570
Malaysia	9019,82	9028,76	9433,88	9956,29	10686,1	11380	12273,8	13338	14119,6	13800	14770,8
Thailand	4944,22	5116,58	5425,88	5886,3	6382,41	6838,76	7365,79	7938,29	8265,57	8089,8	8747,94
Indonesia	2410,3	2520,48	2641,28	2790,08	2974,29	3206,75	3448,52	3744,33	4002,71	4166,16	4410,95
Philippines	2472,62	2528,89	2599,99	2714,31	2902,47	3061,14	3254,07	3521,87	3679,8	3692,08	3922,94
Viet Nam	1415,73	1528,16	1644,03	1781,63	1951,35	2161,27	2388,59	2650,49	2848,9	2996,14	3193,06
Lao PDR	1179,97	1252,46	1342,28	1398,24	1508,76	1723,01	1903,3	1972,2	2069,3	2171,95	2355,08
Cambodia	917,182	997,01	1069,22	1169,44	1309,32	1511,91	1706,29	1919,14	2064,54	2002,6	2159,07
Burma	529,722	598,312	676,888	783,181	910,742	1062,31	1232,99	1412,04	1579,5	1765,36	1950,23
Average	9932,76	10038,1	10421,9	11005,4	11647,7	12378,5	13243,3	14016,3	13956,5	13777,4	14696,6
Average*	2861,2	2946,33	3104,18	3309,94	3578,18	3868,14	4196,66	4562,04	4828,75	4835,52	5188,76

* without Brunei Darussalam dan Singapura

source: ADB Key Indicators for Asia and the Pacific 2011

Figure 2
Average of GDP per capita at PPP 2000-2010
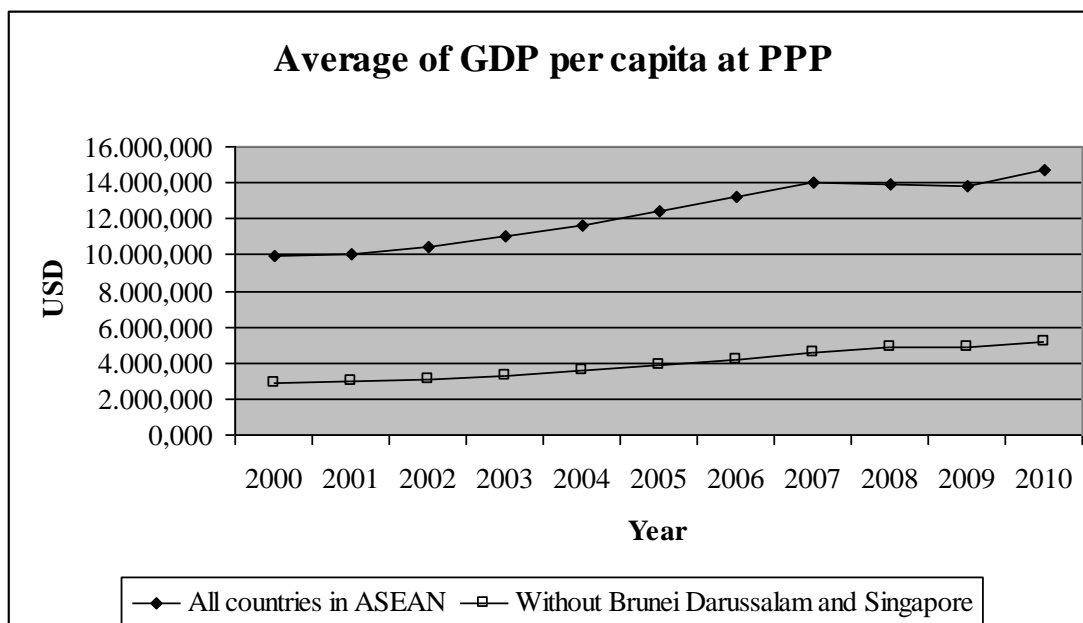
source: *Author's own calculation using the ADB's per capita GDP at PPP*

Table 3 Income Disparity in ASEAN 2000-2010

Year	V_w	V_w*
2000	0,785	0,640
2001	0,776	0,623
2002	0,773	0,621
2003	0,772	0,620
2004	0,771	0,618
2005	0,772	0,607
2006	0,772	0,601
2007	0,768	0,596
2008	0,751	0,589
2009	0,742	0,561
2010	0,747	0,563

* without Brunei Darussalam and Singapore
Source: Author's own calculation using the ADB's Key Indicators for
Asia and the Pacific 2011

Table 4 Income Disparity in ASEAN based on each Group

Year	V_w	V_w*	V_w **	V_w ***	V_w ****	V_w *****
2000	0,785	0,640	0,407	0,319	0,633	0,292
2001	0,776	0,623	0,396	0,317	0,634	0,277
2002	0,773	0,621	0,382	0,324	0,632	0,270
2003	0,772	0,620	0,366	0,338	0,633	0,257
2004	0,771	0,618	0,346	0,345	0,631	0,252
2005	0,772	0,607	0,319	0,345	0,632	0,249
2006	0,772	0,601	0,301	0,347	0,630	0,250
2007	0,768	0,596	0,296	0,343	0,621	0,254
2008	0,751	0,589	0,286	0,334	0,594	0,262
2009	0,742	0,561	0,278	0,310	0,596	0,261
2010	0,747	0,563	0,261	0,319	0,600	0,256

without Brunei Darussalam dan Singapore
** *Cambodia, Lao PDR, Burma, dan Viet Nam*
*** *Indonesia, Philipines, and Thailand*
**** *Brunei Darussalam, Singapore, and Malaysia*
***** *Malaysia and Thailand*
Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011

First Group

As shown in figure 3, income disparities of ten countries in SEA region are getting smaller from year to year except for the last year of observation. At the last year of observation, the income disparity became higher because many of the countries were not able to recover from the impact of global economic crisis as fast as developed countries in this region as reflected in their GDP per capita at PPP (see Figure 1).

Income disparity levels in this group are relatively high since the values are above 0.5. Such conditions are reasonable considering we include developed countries (Brunei Darussalam and Singapore which have very high GDP per capita at PPP compared to others in this region) into our calculations.

However, one point that can be clearly concluded from Figure 3 is that the income disparity between countries in SEA region globally decreased except for the last year observation and this means the development in SEA Region are getting better from time to time.
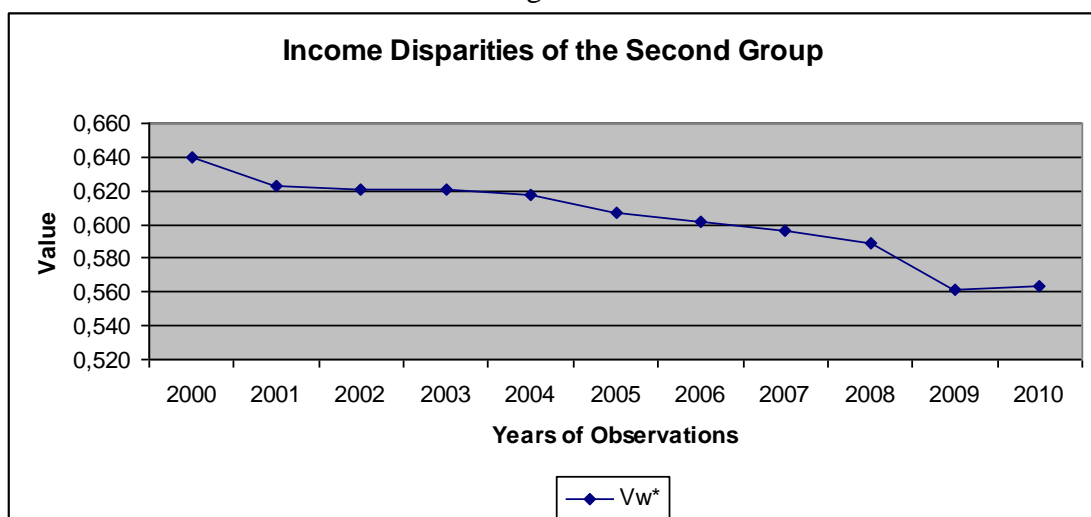
Figure 3
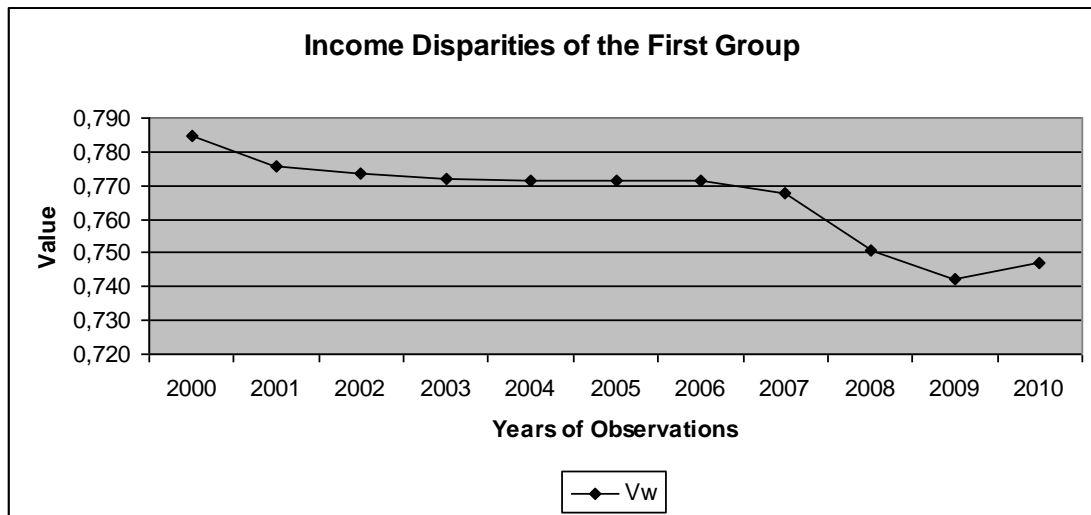
Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011

Second Group

Figure 4 shows that income disparity of the second group is still high (which are above 0.5) at the early years of the observation but it gradually decreased untill 2009 and then increased slightly at the last year of observation. Disparities in this group are relatively high because we included Malaysia and Thailand whose GDP per capita are much higher compared to other countries in this group.

Malaysia and Thailand gained even higher (compared to others in this group) GDP per capita than the year before 2010 after their recovery from 2008/2009 global economic crisis. That explain why the gap of GDP per capita at PPP between both countries with others increased in 2010.

Figure 4

Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011
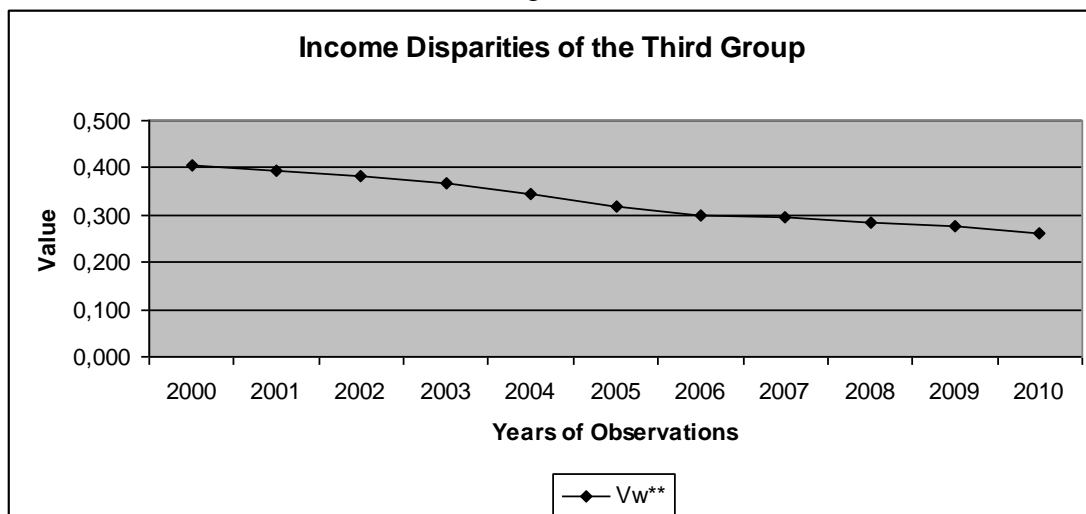
Figure 5

GDP per capita at PPP of the Second Group
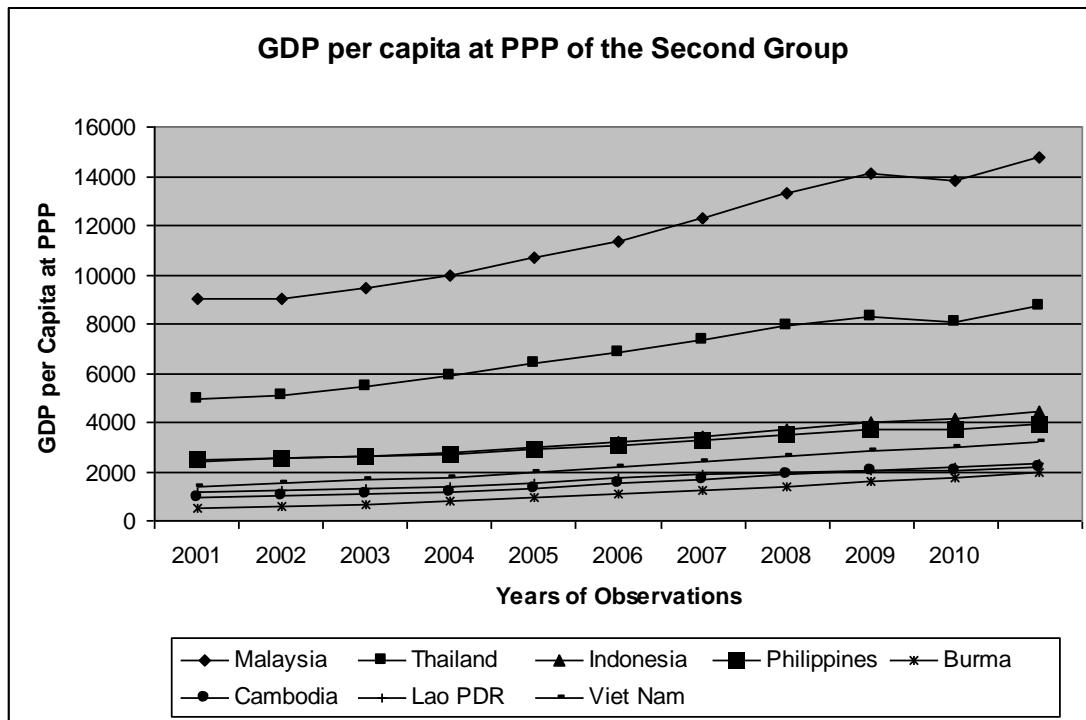
source: ADB Key Indicators for Asia and the Pacific 2011


Third Group

The third group consists of countries with the same economic background as shown in figure 7 with Viet Nam as the leading country. Their income disparities are getting smaller during the years of observations (see figure 6). These implied that the development in this group is getting better from time to time as the income disparities continued to decline during this period.

Figure 6

Income Disparities of the Third Group

Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011

Figure 7

**GDP per Capita at PPP of the Third Group**
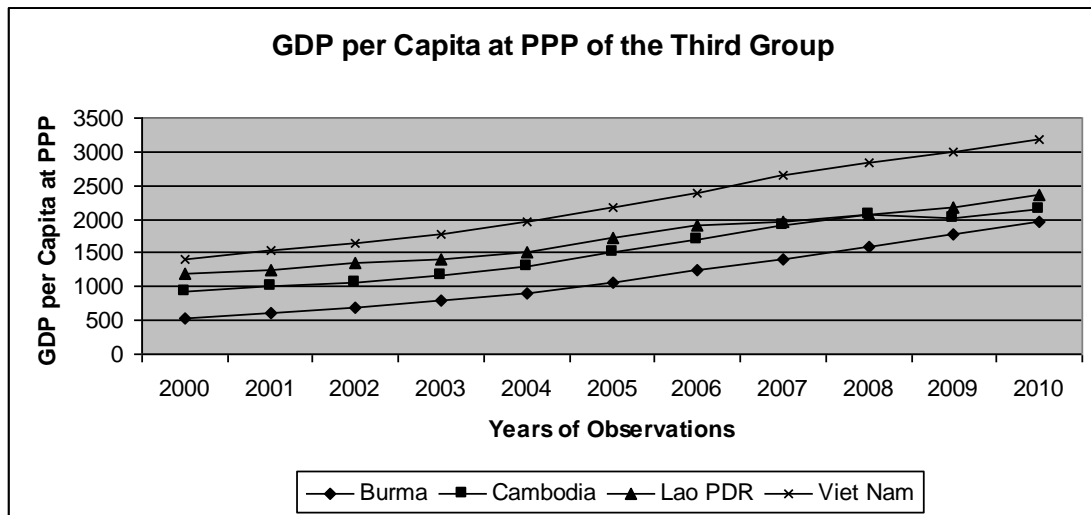
source: ADB Key Indicators for Asia and the Pacific 2011
Fourth Group

Figure 8 shows the fluctuation of the income disparities among the members of the fourth group, their disparities are relatively low –under 0.5. As seen in figure 9, the GDP per capita at PPP that belong to Thailand are much higher than both Indonesia and Philippines.

The disparity drastically decreased in 2009 because the decrease in GDP of Thailand decreased that year was not as drastic as those of Indonesia and the Philippines. However, its disparity increased again in 2010 because Thailand recovered faster than Indonesia and Philippines. As shown in figure 9, GDP per capita at PPP of Thailand increased bigger than Indonesia and Philippines did.

Figure 8
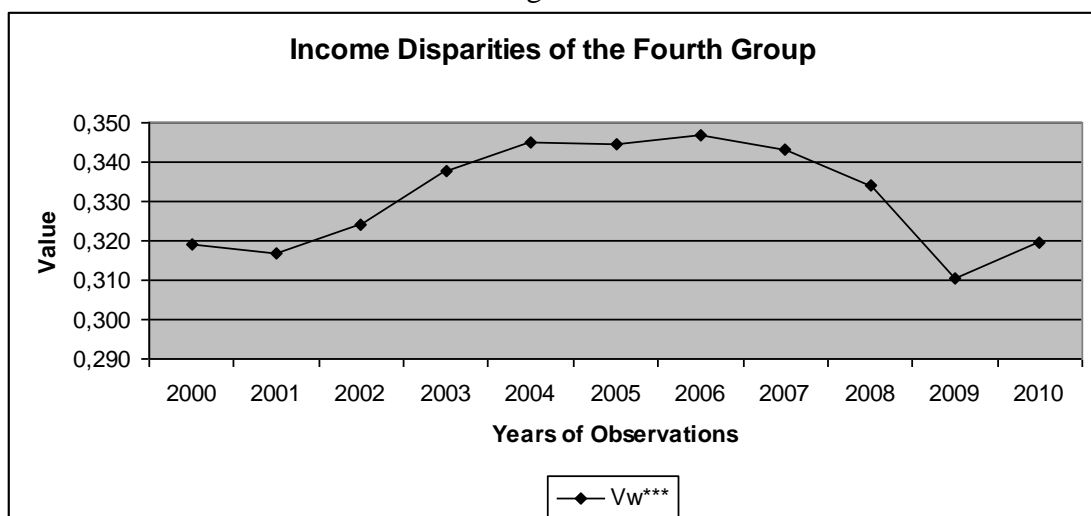
Income Disparities of the Fourth Group

Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011

Fifth Group

The disparities in this group fluctuated from time to time and their values are relatively high (above 0.5, see figure 10). High value of the disparities are due to the inclusion of Malaysia whose GDP per capita are much lower than the other two countries in this group (see figure 11).
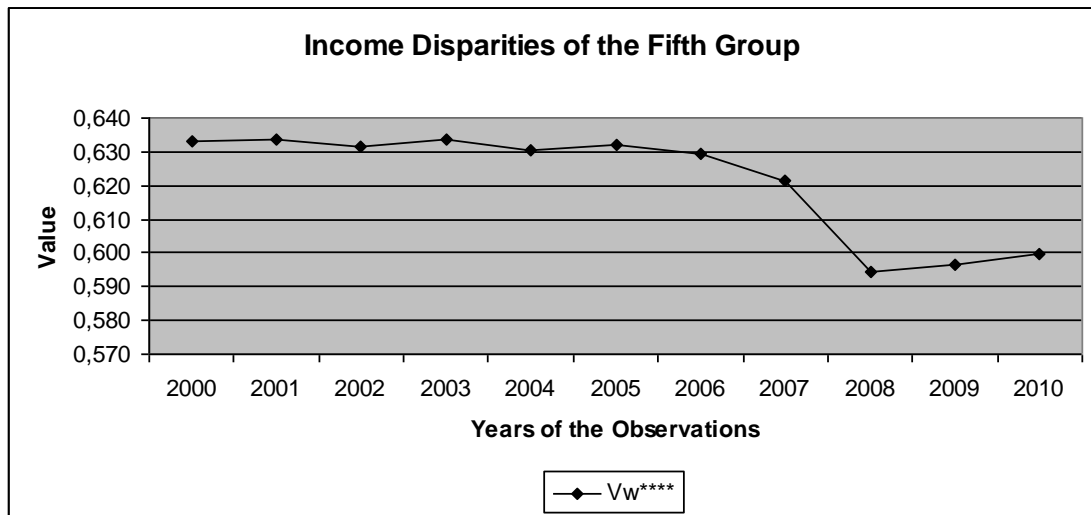
Figure 9

GDP per Capita at PPP of the Fourth Group
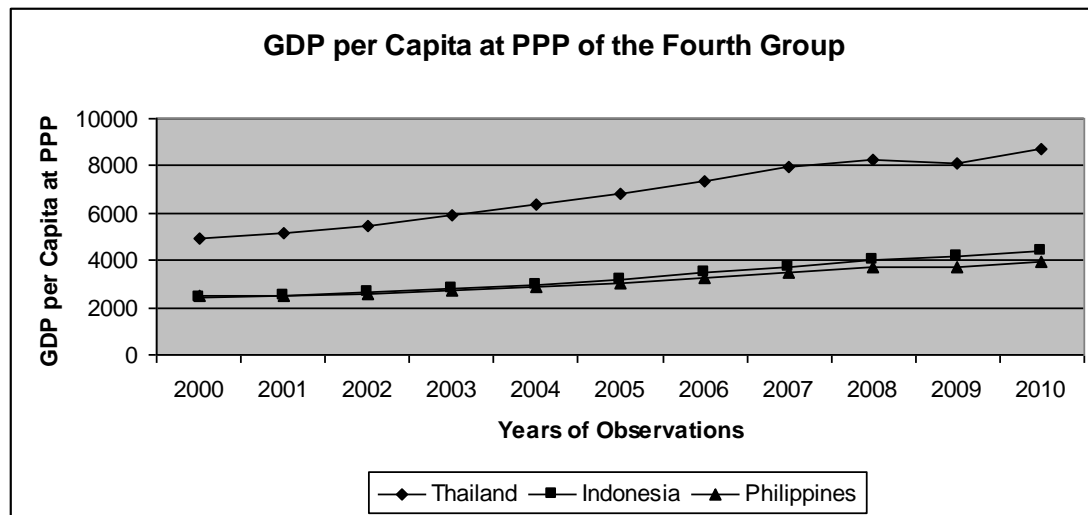
source: ADB Key Indicators for Asia and the Pacific 2011

Income disparity in 2008 decreased substantially because the GDP per capita of Brunei Darussalam and Singapore decreased as an effect of the global financial crisis, while Malaysia's GDP on the contrary increased. From 2009 to 2010, the disparity increased again as Brunei Darussalam and Singapore recovered from the crises, and were able to once again occupy dominant positions in the region.

Sixth Group

Disparities in this group are relatively low (below 0.5) and this means members of this group have the same economic level and their consistent and comparable development has narrowed the gap from each other from 2000 until 2005 (figure 12). Nonetheless, this gap increased from 2006 and reached its peak in 2008. The increase in disparities during this period was because Malaysia's GDP increased much more than Thailand did (figure 13). Disparities during 2009-2010 decreased again due to the parallel development in each country reaching the same level of success.

Figure 10

Source: Author's own calculation using the ADB's Key Indicators for Asia and the Pacific 2011

Figure 11
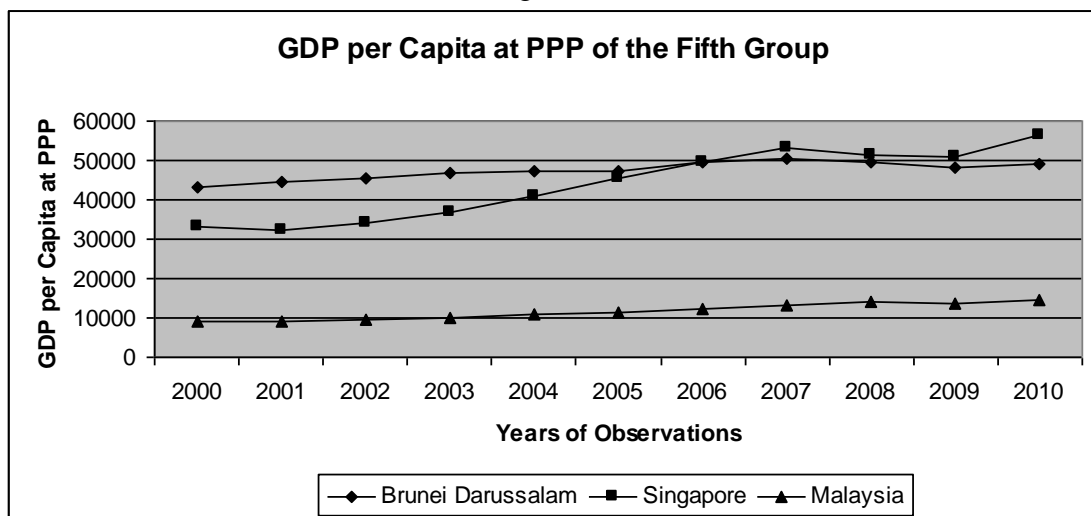
source: ADB Key Indicators for Asia and the Pacific 2011

Conclusion

Generally, disparities in SEA Region during 2000 until 2009 gradually decreased due to the successful development in each country. However due to the unbalanced recoveries (between countries) from the 2008/2009 global economic crisis, the disparity increased in 2010. However, fluctuations of disparities can be seen in each group due to their differences in economic conditions.

From the calculations showed in the groups sections, we can conclude that there are four economic groups in SEA region. The first group consists of Brunei Darussalam and Singapore. The second group consists of Malaysia and Thailand. The third group consists of Indonesia and Philippines. And the fourth group consists of Viet Nam, Lao PDR, Cambodia, and Burma. All these groups have different background due to the values of their GDP per capita at PPP so that when included in one calculation, the disparities as a result are high (which is above 0.5 at average).

Figure 13
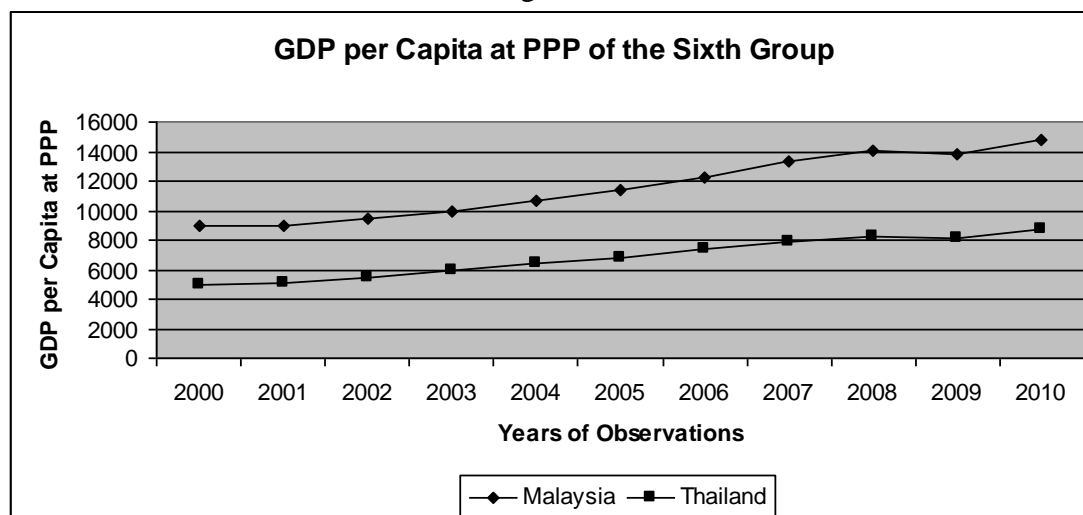
source: *ADB Key Indicators for Asia and the Pacific 2011*

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