Borders and economic growth: The case of Sabah and her neighbours

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13 January 2008

BORDERS AND ECONOMIC GROWTH: THE CASE OF SABAH AND HER NEIGHBOURS

by

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ABSTRACT

Disparity in income across states and regions in Malaysia continues to be a matter of concern. The purpose of the present study is to investigate empirically the question of whether the economic development of the state of Sabah has an impact on her neighbouring countries or *vice versa*, the growth of her neighbouring countries have causal effect on the growth of the state of Sabah. Using annual data for the period 1983 to 2003, our results from employing the ARDL bounds testing approach indicate that the growth of the state of Sabah is affected by the growth of Brunei Darussalam, Sarawak, and Kalimantan Timur. Further, the growth of the state of Sabah has an impact on her neighbouring states, country and provinces during the period under study.

1. INTRODUCTION

An uneven distribution of income which involves wide disparities between rural and town dwellers, between inhabitants of Malaysia and the Borneo states as well as among various social groups was identified in the various volumes of the Five-Year Malaysia Plans. For example, in the First Malaysia Plan (1965-1970) the government envisaged bringing the low-income states to the general income level by 1985, so that economic development will yield the fullest possible human benefits (Government of Malaysia, 1965). Further effort to correct the disparity, according to Taylor and Ward (1994), has been the aim of Malaysian regional planning during the 1970s and 1980s by speeding industrialization and its benefits throughout the country.

The Five-Year Malaysia Plans reflects the sincerity of the Malaysian government in eradicating if not elevating the problem of regional or states imbalances. Accordingly, in their quest to achieve both development and equity at the same time, policies and strategies are continuously being formulated and implemented across the states. However, it seems that for the past four decades, regional development planning has limited success in narrowing

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regional income gap between states and regions in Malaysia. Table 1 show the reality of the state's economic performances between the year 1970 and 2000.

As shown in Table 1, in the year 1970, the income of four states of the more developed states category are above the national average, where Wilayah Persekutuan as the leader[2]. On the other hand, under the less developed states category, six out of seven of the states are below the national average. Only Sabah's real GDP per capita is above the national average. However, in year 2000, interesting development emerge. For the more developed states, Melaka and Penang has been catching-up and emerge as the new states that contribute to the above average to national GDP. Unfortunately, the states of Perak and Negeri Sembilan has been lagging for the past four decade and in year 2000, their real GDP per capita has been below the national average.

On the other hand, for the less developed states, the state of Terengganu has been catching-up to the richer states. But, Sabah being the third richest states in 1970, has been relegated to the third poorest states in Malaysia. In term of ranking (shown in the parentheses), Terengganu ranked second to Wilayah Persekutuan as the richest states. Kedah and Kelantan remain poor for the last three to four decades. Sarawak, on the other hand, despite bordering Sabah, manages to maintain her position as the eighth richest states in Malaysia in year 2000.

In the Second Outline Perspective Plan (1991-2000), emphasized were given to reduce the large imbalances in economic development between states and regions. In fact, one of the important objectives of regional development was to progressively integrate the regional economies of the states of Sabah and Sarawak to foster national integration and to promote the complementarity of these economies with the economy of the peninsular states (Government of Malaysia, 1991). Based on the success of the Growth Triangle economic cooperation of the Singapore, Johore and Indonesia (SIJORI), the Malaysian government has been promoting another growth triangle- the BIMP-EAGA (The Brunei Darussalam Indonesia Malaysia and the Philippines-East ASEAN Growth Area) to enhance growth in Sabah and Sarawak.

Thus, the objective of the present paper is to test empirically the economic impact of the bordering countries or states or provinces on the economic growth of Sabah. The state of Sabah is situated in the island of Borneo. Sabah is surrounded by Sarawak, Brunei Darussalam, and Eastern Kalimantan. The sample period selected for this study consist of 21 annual data ranges from 1983 to 2003.

The plan of the paper is as follows. In the next section we discuss some evidence on the effect of geographical proximity or location and the growth of nations. In section 3, we present the unit root testing and the *Granger* causality test in the ARDL framework used in the study. In section 4, we discuss the empirical results and the last section contains our conclusion.

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[2]The more developed states are Johore, Melaka, Negeri Sembilan, Perak, Penang and Selangor. The less developed states are Kedah, Kelantan, Pahang, Perlis, Sabah, Sarawak and Terengganu. The Federal Territory of Kuala Lumpur and Putrajaya are categorized as more developed states, while the Federal Territory of Labuan is classified as less developed states.

2. REVIEW OF RELATED LITERATURE

The Growth Triangle

To produce a successful growth area or a growth triangle, four criteria has to be met, that is, economic complementarity, geographical proximity, integrated infrastructure and political will. Economic complementarity means that countries intending to cooperate under a growth area must have something to offer which their other partners in the group would need, be it in the area of production, available resources, technology and skills as also in the areas of specialization of labour forces, in service rendering and even in geographical locations. Geographical proximity or contiguity implies that cooperation (in exchange or transaction of something) would be cost-effective amongst countries if they were contiguous. On the other hand, countries intending to cooperate under a growth triangle must integrate their road and rail networks for improved transportation of goods and services within the zone. Movement of different modes of transports within the region had to be rapid and smooth in order to facilitate exchanges of all kinds. An improved transportation system was essential to ensure lower transaction cost. Last but not least is the political will. Government commitment to, and active support for growth triangles is a key success factor. Although the private sector drives growth, government also play a key role, both in facilitating the development of links and in initiating cooperation. Thus, the public sector needs strong political will and sustained commitment if governments at all levels – central, state and local – are to develop and implement supportive policies (East Asia Analytical Unit, 1995).

As far as the Government of Malaysia is concern, according to the Eight Malaysia Plan (2001-2005), at the ASEAN level, closer cooperation between neighbouring countries was foster through the Growth Triangles, namely, the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT), the Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA), and the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT). Joint-venture projects in the Growth Triangles stimulated economic growth in the participating states in Malaysia. The private sector took a leading role in the development of joint-venture projects while the Governments of the participating countries facilitated their efforts (Government of Malaysia, 2001).

The East ASEAN Growth Area (BIMP-EAGA)

The BIMP-EAGA stands for the Brunei Darussalam Indonesia Malaysia and the Philippines – East ASEAN Growth Area. It has been considered Asia's largest regional grouping, involving territories of four ASEAN countries comprising a land area of roughly 1.54 million square kilometres. EAGA comprises the entire sultanate of Brunei Darussalam; 10 provinces in the Indonesian islands of Kalimantan (East, Central, South and West), Sulawesi (Central, North, South and South-East), Maluku, and Irian Jaya; Sabah, Sarawak, and Labuan in Malaysia; and 5 regions in the Philippines island of Mindanao (West, North, South and Central) and Palawan.

The BIMP-EAGA was formally established in 1994 with major goals to increase trade, tourism and investment in the growth area through cross-border cooperation. Economic

growth in this area is expected to be principally driven by new investments from both local and foreign enterprises. The governments of the four participating countries are encouraging the private sector to take a leading role to engage in collaborative activities between the regions. According to Sobrepena (1994), this so-called growth triangle is an innovative approach to regional development planning. The approach that adopts outward looking, transnational solutions to domestic concerns like depressed regions, inequitable distribution of growth, and urban core periphery relationship problems.

It has been claimed that the BIMP-EAGA initiative has yielded positive results for the past decade. For example, the air-links between Davao-Kota Kinabalu and Davao-Manado registered a rapid increase in incoming and outgoing passenger load. The direct air connection has contributed to increase Indonesia trade with Mindanao. The EAGA's sea transport has resulted in a small economic boom between two cities - Zamboanga and Sandakan. The Philippine tourism industry is said to have most benefited from the EAGA initiative in terms of tourist arrivals. Tourist arrivals in Central and Southern Mindanao have continued experiencing a general increase, totaling slightly less than a million arrivals in the period covering 1996 to Q2 1997. In Brunei, continuing EAGA activities have raised consciousness of doing business with Sabah and Sarawak. In Malaysia, Sabah is the recipient of development in the telecommunication industry. International Communications and Electronics (ICE), an Australian Northern Territory company, has entered into a multi-million dollar joint venture with Malaysian partners to construct a RM140 million Sabah Ducting System (SDS), aimed to provide internal and external links throughout Sabah.[3]

Nevertheless, despite the positive achievement of the BIMP-EAGA initiative, are the regions in BIMP-EAGA converging? The notion of economic convergence usually refers to a process in which national economies display increasing similarities in the patterns of their performance. From an economic policy point of view, the issue of convergence and divergence is very important. In a case of spontaneous convergence, this would point to the existence of market forces, which will eventually lead to similar living standards across regions. In the case of persistently large (or widening) gaps between poor and rich regions, there could be a need for economic policy measures to stimulate a catch-up process.

Since poorer regions are generally considered to have capital-labour ratios below their long-run optimum, and thus to be backward in adopting the available technology, their rate of return on fixed investment should be higher than in richer regions. Consequently, there should be a systematic tendency for poorer regions to grow faster than rich regions until they have caught-up with the levels of income per capita in the latter. This is the co-called convergence hypothesis. The presumption that poorer regions, on average, will grow faster than richer ones (over the long-term) has been termed (absolute) beta convergence. Such differential growth is necessary to reduce the inter-region variation of per capita income levels. A tendency for the dispersion of per capita incomes (as measured by their standard deviation) across a group of economies to fall over time has been labelled sigma convergence.

3. METHODOLOGY

Testing for cointegration (or long-run relationship) and subsequently *Granger* causality test requires that each regional income series to be integrated of order one. Equation (1) is the

[3]Information compiled from www.brunet.bn/org/bimpeabc/welcome.htm.

conventional augmented Dickey-Fuller (ADF) regression to test for the presence of unit root in the regional income,

$$\Delta y_t = \alpha + \delta t + \beta y_{t-1} + \sum_{j=1}^{p} \theta_j \Delta y_{t-j} + \varepsilon_t \quad (1)$$

for $j = 1,\ldots,p$ ADF lags is to ensure white noise. We estimate regional income series in levels with a constant and trend, while the regional income in first differences only with a constant.

An autoregressive distributed lag (ARDL) model between y_t and x_t on their own lagged values can be specify as follows

$$y_t = \sum_{j=1}^{p} \lambda_j y_{t-j} + \sum_{j=1}^{q} \delta_j x_{t-j} + \varepsilon_t \quad (2)$$

The variables are expressed either as levels or as first differences, depending on the order of integration assumed. To implement the ARDL bounds testing procedure, Equation (1) is remodeled as a conditional ARDL-ECM (unrestricted) as follows

$$\Delta y_t = \phi y_{t-1} + \beta x_{t-1} + \sum_{j=1}^{p} \lambda_j^* \Delta y_{t-j} + \sum_{j=0}^{q} \delta_j^* \Delta x_{t-j} + \epsilon \quad (3)$$

where $\phi = -\left(1 - \sum_{j=1}^{p} \lambda_j\right)$, $\beta = \sum_{j}^{q} \delta_j$, $\lambda_j^* = -\sum_{m=j+1}^{p} \lambda_m$, and $\delta_j^* = -\sum_{m=j+1}^{q} \delta_m$. The bounds test for examining evidence for cointegration or a long-run relationship can be conducted using the *F*-test. The *F*-test statistic tests the joint significance of the coefficients on the one period lagged levels of the variables in Equation (3), that is, $H_0: \phi = \beta = 0$. The asymptotic distribution of critical values is obtained for cases in which all regressors are purely *I*(1) as well as when the regressors are purely *I*(0) or mutually cointegrated. Because the critical value of the test depends on the order of integration of the variables, *I*(*d*), where $0 \leq d \leq 1$, the test utilizes a critical range such that values exceeding the range are evidence of rejection, values less than the range are evidence of non-rejection, and values within the range are inconclusive (Pesaran et al., 2001). In other words, if the test statistics exceed their respective upper critical values (assuming purely *I*(1) regressors) we can conclude that a long-run relationship exists. If the test statistics fall below the lower critical values (assuming the regressors are *I*(0)) we cannot reject the null hypothesis of no cointegration. Inconclusive results achieved when the test statistics fall within their respective bounds. Further, if $\phi < 0$, the long-run relationship between y and x is stable, and can be expressed as $\theta = -\frac{\beta}{\phi}$.

4. THE EMPIRICAL RESULTS

Data

In this study we are using real per capita regional gross domestic product (proxy for regional income) for the four regions in BIMP-EAGA for the period 1983 to 2003 in US$. To derive at each of the real regional income per capita, each of the nominal (domestic currency) regional GDP was divided by the regional population and consumer price index. To convert to income of common currency we deflate all real per capita regional gross domestic products with US currency. All data were converted into natural logarithm for estimation throughout the study.

Data for nominal regional GDP, consumer price index, population and exchange rate (domestic per US$) for the regions in the East ASEAN growth area were compiled from various sources as follow: (a) Sabah and Sarawak from various issues of the respectively Sabah Statistical Yearbook and Sarawak Statistical Yearbook published by the Department of Statistics Malaysia; (b) Eastern Kalimantan province of the Indonesian island from BPS Statistics Indonesia website available at http://www.bps.go.id; and (c) data for Brunei from various issue of the Brunei Darussalam Statistical Yearbook published by the Statistics Division, Department of Economic Planning and Development, Ministry of Finance, Brunei Darussalam.

Unit Root Test

The results of the unit root tests are presented in Table 2. The optimal lag length is selected using the SC criterion. Result of unit root tests clearly indicates that all regional income series are integrated of order one, that is, they are stationary in first-differences. In other words all regional income series are $I(1)$ processes.

Having determined that the regional income series are all of the same order of integration, we next test for cointegration using the ARDL approach. Since the series are all $I(1)$ processes, the relevant critical values are the upper bound of purely $I(1)$ regressors. These results are tabulated in Table 3. When using Sabah as the dependent variable, the null hypothesis of no cointegration can be rejected at least at the 5 percent significance level. In all the three cases, Sabah is cointegrated with Brunei Darussalam, Sarawak and Eastern Kalimantan. The result suggests that there are long-run relationships between Sabah and Brunei Darussalam, Sabah and Sarawak, and Sabah and Eastern Kalimantan. Further the results indicate that Brunei Darussalam, Sarawak and Eastern Kalimantan have an impact on the development in Sabah, where the causality runs from these bordering regions to Sabah. On the other hand, interestingly, we observed that when the bordering regions were used as the dependent variable, in all cases the null hypothesis of no cointegration can be rejected at least at the 5 percent level. This cointegration results suggest that the causal effect runs from Sabah to the neighbouring countries. In other words, results in Table 3 clearly suggest that there is two-way causation between Sabah and her immediate neighbours.

5. CONCLUSION

The purpose of the present study is to investigate the impact of bordering countries surrounding the state of Sabah for the period between 1983 and 2003 using an ARDL bounds testing procedure suggested by Pesaran et al. (2001). Upon testing the time-series properties of the regional per capita GDP by using the standard ADF test, we found that all regional income series are $I(1)$ processes. The ARDL bounds test results indicate that Sabah and her bordering countries/state/provinces are cointegrated, that is, there are long-run relationships between them. Furthermore, our results suggest that there are bidirectional Granger causal effect between Sabah and her neighbours. Cointegration and two-way causation between Sabah and her bordering neighbours implies that the policies drawn and effort by the three government-Brunei Darussalam, Indonesia and Malaysia through the BIMP-EAGA is taking place in the right direction.

REFERENCES

Department of Statistics Malaysia. *Sabah Statistical Yearbook*, various issues.

Department of Statistics Malaysia. *Sarawak Statistical Yearbook*, various issues.

East Asia Analytical Unit. 1995. *Growth triangles of South East Asia*. Australia: East Asia Analytical Unit.

Government of Malaysia. Malaysia Plan various issues.

http://www.bps.go.id

http://www.brunet.bn/org/bimpeabc/welcome.htm

Ministry of Finance Brunei Darussalam. *Brunei Darussalam Statistical Yearbook*, various issues.

Narayanan, P.K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics*, 37, 1979-1990.

Pesaran, M.H., Shin, Y., and Smith, R.J. (2001). Bounds testing approaches t the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289-326.

Sobrepena, A.M. (1994). Regional cross-border cooperation: A new dimension in regional planning. *Development Research News*, 12, 1-4.

Taylor, M. and Ward, M. (1994). The regional dimension of industrialization. In H. Brookfield (Editor). *Transformation with industrialization in Peninsular Malaysia*. Kuala Lumpur: Oxford University Press.

Table 1: Real GDP per Capita, 1970 and 2000 (Malaysia=100)

States	1970	2000
Northern Region:		
Kedah	73 (11)	60 (13)
Perak	103 (5)	81 (9)
Perlis	72 (12)	66 (11)
Penang	96 (6)	143 (3)
Central Region:		
Melaka	72 (13)	104 (5)
Negeri Sembilan	104 (4)	93 (7)
Selangor	148 (2)	124 (4)
Wilayah Persekutuan	176 (1)	205 (1)
Eastern Region:		
Kelantan	44 (14)	42 (14)
Pahang	93 (7)	67 (10)
Terengganu	81 (10)	154 (2)
Southern Region:		
Johore	84 (9)	96 (6)
Sabah	118 (3)	65 (12)
Sarawak	92 (8)	90 (8)
Malaysia	100	100

Notes: Author's calculation. Figures in the parentheses are indicator of states ranking according to real GDP per capita.
Sources: Computed from various issues of the Malaysia's Development Plans.

Table 2: ADF unit root tests for the order of integration

Real per capita regional GDP series	Levels: Constant and trend	p	First differences: Constant	p
Brunei Darussalam	-2.56	0	-4.67*	0
Eastern Kalimantan	-2.09	0	-4.71*	0
Sabah	-2.07	0	-3.71*	0
Sarawak	-2.81	0	-5.13*	0

Notes: Asterisk (*) denotes statistically significant different from zero at the 5% level. The optimal lag length, p was chosen based on SC criterion throughout the analysis.

Table 3: Bounds tests results for cointegration

Critical value bounds of the *F*-statistic: intercept and no trend						
	90% level		95% level		99% level	
T	*I*(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
32	3.303	3.797	4.090	4.663	6.027	6.760

Calculated *F*-statistic:		
Bordering country(BC)	$F_S(S\|BC)$	$F_{BC}(BC\|S)$
Brunei Darussalam	5.837**	5.306**
Sarawak	10.277***	8.524***
Eastern Kalimantan	9.546***	7.895***

Notes: Asterisk (**) and (**) denote statistically significant at the 5% and 1% level respectively. Critical values are taken from Narayanan (2005).