

EAST COAST ECONOMIC REGION FROM THE PERSPECTIVE OF SHIFT-SHARE ANALYSIS

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ABSTRACT

The Malaysian government is promoting a new regional development method particularly by promoting a regional development corridor. Our paper tries to examine this new development from the perspective of regional shift-share analysis that covers the period of 2005 – 2007. For that purpose, we compile several data which is subdivided into three different sub-periods, aims at analysing the performance of ECER economy vis-à-vis national economy. The ECER regions GDP data are accordingly collected by its major sectors sourced from the EPU and respective state's EPU which is expressed in its real value by using the GDP deflator. The results revealed that to investors the ECER regions is unattractive locationally, and its advantage in agriculture, manufacturing, and construction sectors is improved because of structural change at the national level. As an alternative, this study offers a few policy recommendations for investment plans in promising lucrative returns to production and business sectors.

Keywords: ECER; Shift-Share Analysis; National Shift; Regional Shift; Industry Mix

1. INTRODUCTION

ECER is recently promoted as one region of several regional development economic plans in order to poise for a same standard of regional economic development and growth in Malaysia. This particular economic region covers the East Coast States of the Peninsular comprising Kelantan, Terengganu, Pahang, and also the district of Mersing, which is a part of the Johor state. Generally, all these selected states possesses areas with low economic performance compared to states in the West Coast of Malaysian Peninsular particularly states under the Northern Corridor Economic Region (NCER) which embraces the states of Perlis, Kedah, Pulau Pinang, and North of Perak (Hulu Perak, Kerian, Kuala Kangsar, and Larut Matang-Selama). Thus, the main purpose of this study is to examine the differences in economic development of the ECER regions compared to the national level of the Malaysian economy as a whole and explain the unique industrial mix of the ECER and local competitiveness potential by using the shift-share analysis. Basically, the ECER regions are rich in agricultural resources, rubber, and fisheries in early

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1980's, and become main contributor to the GDP's region. But, starting 1990's during the process of diversified activities, agriculture become the third largest contributor to the GDP's region, behind services and manufacturing sector. Although, the rapid growth in the services and manufacturing sector during the last decade, but the performance of services and manufacturing sectors in ECER regions considered very low compared to NCER regions which is recorded RM31,706 million, and RM28,244 million in manufacturing and services, respectively for the year 2007.

On different view, the performance of agriculture sector in ECER regions remains significant especially to food security and rural development despite decline in the sector's relative contribution to national income, and employment generation and also recorded the higher share to the GDP's region contribution compared to NCER regions. This situation shows that the ECER regions have advantages over the NCER regions in terms of location and resources.

In 2007, the services sector of the ECER produced a value of total output amounting to RM24,855 million and is the biggest contributor to the GDP in this particular region. The main sub-sectors in this services sector that contributed most to the total output for ECER regions are hotels and restaurants, transport, storage and communications, and business services. Total output of this sector consistently keeps on an increasing trend from year to year since 2005. Despite this trend, other sectors like manufacturing and agriculture shows a remarkable increased in contribution to ECER's GDP following behind services output. It is found that at the earlier period of study the main economic activities was very much dependent on the services sector particularly and the tertiary sector in general. In 2005, the tertiary sector contributed almost half (54 percent) to the ECER's GDP. In the period of 2005 – 2007, the study established that, ECER's economy had experienced the expansion of diversified activities. In the final period of study, i.e. the year 2007, contribution of tertiary sector had increase to 55 percent. The expansion process of diversified activities was traced through the change of economic structure changes of the state economy as shown in Table 1.

Table 1: Gross Domestic Product of ECER Regions and Malaysia 2005-2007 (RM million in 2000 prices)

Sector	ECER regions			Malaysia		
	2005	2006	2007	2005	2006	2007
Agriculture	6,549	7,108	7,000	35,524	37,375	37,846
Mining & quarrying	70	57	68	42,439	41,995	42,842
Manufacturing	10,836	11,971	12,236	131,388	140,407	144,423
Construction	990	1,017	1,117	13,286	13,183	13,791
Services	22,164	23,142	24,855	220,595	237,279	260,496
Total	40,609	43,295	45,276	443,232	470,239	499,398

Sources: The Malaysian Five Year Plan, Various Issues, Economic Planning Unit

Meanwhile, Table 2 shows the contribution of the sector to employment generation in ECER regions and Malaysia for the period 2005 – 2007. Although the Malaysian economy has undergone significant structural changes over the last four decades, the resources based sector particularly in agriculture, forestry, livestock, and fishing continue to contribute significantly to the ECER's growth and development especially in job creation after the services sector. For instance, in the generation of the employment, services sector plays an important role in providing employment. The main sub-sectors in this services sector are hotels and restaurants, transport, storage and communications, and education. In 2005, services sector recorded 0.70 million people and increased to 0.73 million people in 2006, and further increased to 0.76 million people in 2007. The agriculture sector also recorded an increase in providing job opportunities to the people in ECER regions. The generation of employment for this sector in 2005 amounted about 0.30 million people and increased to 0.31 million people in 2006, and further increased to 0.32 million people in 2007. Despite the services and agriculture contribute more in providing job opportunities in ECER regions, the manufacturing and construction sectors also show the significant contribution to the job creation.

This study is organized in these following ways: Part II explains theoretical framework of regional shift share model used in this study and data compilation. Part III discusses finding results of the model followed by Part IV concluding the discussion of the paper.

Table 2: Employment by Sector of ECER Regions and Malaysia 2005-2007 ('000)

Sector	ECER regions			Malaysia		
	2005	2006	2007	2005	2006	2007
Agriculture	296.2	313.9	326.0	1,470.4	1,503.5	1,558.2
Mining & quarrying	7.6	6.8	8.3	36.1	42.0	39.4
Manufacturing	154.4	162.5	155.6	1,989.3	2,082.8	1,977.3
Construction	144.6	148.3	148.1	904.4	908.9	922.5
Services	703.0	736.0	760.0	5,645.0	5,738.0	6,041.0
Total	1,305.8	1,367.5	1,398.0	10,045.2	10,275.2	10,538.4

Sources: Department of Statistics, Malaysia

2. SHIFT-SHARE LITERATURE

Most studies on regional growth and employment growth use aggregate variable information to describe the sources growth of GDP or employment in particular area or region. So, the main purposes of using shift-share analysis in regional growth analysis are to decompose the growth of GDP, or employment to explain the competitiveness and uniqueness of region. Amongst many studies in regional economics, for the first time shift-share analysis was introduced by Dunn (1960). His techniques were later used by Perloff et. al. (1960) to work on data that relates to employment and job. Brown (1969), Franklin and Hughes (1973), Stevens and Moore (1980),

Andrikopoulos, Brox and Carvalho (1990) had used the same method in their studies using data on employment and regions, explaining different gaps between regional growth. Franklin and Hughes (1973) and Stevens and Moore (1980) used this technique to forecast annual industry using two digit data taken from the United States Statistics Bureau. By using the same principles, Brown (1969) combine this technique with econometric to forecast employment and suspected that unequal coefficient Theil can increase level of forecasted efficiency. He later found that the econometric model super ingrown is efficient. In Malaysia, Wee and Wong (1987) used the same approach to identify alternative exports markets. Zakariah (2003) used this technique using data on Kelantan state GDP in his study to analyse the performance of Kelantan's economy vis-s-vis national economy. Recently, Mondal (2009) has been done research on ECER regions. But, due to lack of data at regional level, he used data on gross domestic product (GDP) for 11 sectors in Malaysia and examines the potential of GDP of each sector.

3. SHIFT-SHARE MODEL

The shift-share method provides valuable detail about the uniqueness of local growth and competitiveness of local industries. This method begins with a baseline value for expected output growth and is termed as the national growth component. The second component, termed as the industrial mix component, adds or subtracts a GDP change value that accounts for the country's unique industrial mix. The third component, is termed as competitive share, adds or subtracts a GDP change value reflecting the competitiveness of local firms within their own particular industrial sector. The sum of these three components equals to total GDP change in the country during the period measured. The advantages of using this technique are: (1) it is simple and straight forward calculations, and can be readily understood; and (2) the ability to measure the gains and losses of each market in comparison with the total market.

This model is used by selecting a region as a standard comparison to another region which is under study. ECER structural change will be compared with structural change of the standard region. For our purpose the standard region is the national economy. In this way we are able to compare the performance of subsectors in both region, identify ECER subsectors that grow more rapidly and expand more slowly compared to the national economy. Thus, information collected in this process is useful in explaining the ECER economics structural change that determines the setting of the existing growth path scenario.

The above method enables us to sort or separate factors that produce changes in GDP between regions and identify changes in this component. These results can explain the increase or decrease of growth by two level of information, (1) one region in a national economy; and (2) one industry in one region. The 'regional shift' component explains the relative regional performance in an industry. A positive regional shift means that the industry enjoys the locational comparative advantage for the region and vice versa for negative signs.

Each component in the regional shift equation provides the expected level of output resulted from the factors that contribute to the increase or decrease of growth in the specific period of

time. This total of expected output level is the total output of the sector at the end of specific period of time. In this study, we applied model used by Steven and Moore (1980), and Rashid (2003).

The components in the shift-share analysis can be explained in the following equations:

$$\text{National share} : NS_i = x_i^{t-1} (X^t/X^{t-1}) \quad (1)$$

$$NS_i^* = x_i^{t-1} [(X^t/X^{t-1}) - 1] \quad (2)$$

$$\text{Industry Mix} : IM_i = x_i^{t-1} (x_i^t/x_i^{t-1} - X^t/X^{t-1}) \quad (3)$$

$$\text{Regional Shift} : RS_i = x_i^{t-1} (x_i^t/x_i^{t-1} - X^t/X^{t-1}) \quad (4)$$

Each x_i and X_i shows regional output and national output in sectors i ; next x and X is the total regional and national output in all sectors; and finally $t-1$ and t is the beginning and ending period of study. Thus, in definition output of sector i relates to equation (5).

$$x_i^t = NS_i + IM_i + RS_i \quad (5)$$

Regional share in sector i (or regional proportion) is defined as such in equation (6):

$$RP_i = x_i^{t-1} (x_i^t/x_i^{t-1}) = NS_i + IM_i \quad (6)$$

Equation (6) explains the total expected output of industry i in that region assuming that the region is growing proportionately to the national growth rate.

4. DATA

The present paper defines ECER regions comprises the states of Kelantan, Terengganu and Pahang, excluding the district of Mersing; due to unavailability of GDP data for the district. Even if the district GDP data is available, it is considerably small amounting less than 5 percent of the regional GDP, to give any significant to this study. For the purpose of this study, we proposed a selection of three sub-periods to represent estimates of the effect on industrial mix and regional shift. The three sub-periods are chosen accordingly as follows: 2005 – 2006, 2006 – 2007, and 2005 – 2007. The base year for sub-period 2005 – 2006 is 2005, and for the sub-period 2006 – 2007, and 2005 – 2007, the base year are 2006, and 2005, respectively. The sub-sector i represent the subsectors of agriculture, mining, manufacturing, etc. Data used in this study are sourced from the ECER regions Gross Domestic Product (GDP), and the EPU's Malaysian Five Year Plan and Mid-term Review.

Table 3: Shift-share analysis ECER – Malaysia 2005 – 2006 (RM million in 2000 prices)

Sector	2005-2006				
	RP	RS	NS	NS*	IM
Agriculture	6,890.45	217.76	6,948.04	399.04	-57.59
Mining & quarrying	69.27	-12.27	74.27	4.27	-5.00
Manufacturing	11,580.17	391.17	11,496.26	660.26	83.91
Construction	982.36	34.67	1,050.32	60.32	-67.97
Services	23,841.01	-698.30	23,514.50	1,350.50	326.52
Total	43,084.68	211.61	43,083.39	2,474.39	1.30

Sources: Estimated from Shift-Share Model

5. RESULTS

This study reveals that within the sub-period of 2005 – 2007, the ECER region had experienced a negative regional shift (Table 3 – Table 5). This generally means it has regional disadvantages for all sub-periods of time except for period 2005 – 2006. The value of RS for sub-period 2006 – 2007, and 2005 – 2007 recorded a negative value which amounted to RM704 million, and RM479, respectively while for sub-period 2005 – 2006, recorded a positive value which amounted to RM212 million. This shows that the regional advantages at the beginning time of study changed to regional disadvantages at the end of the study.

Table 4: Shift-share analysis ECER – Malaysia 2006 – 2007 (RM million in 2000 prices)

Sector	2006-2007				
	RP	RS	NS	NS*	IM
Agriculture	7,197.64	-197.58	7,548.76	440.76	-351.12
Mining & quarrying	58.15	9.85	60.53	3.53	-2.38
Manufacturing	12,313.51	-77.40	12,713.31	742.31	-399.80
Construction	1,063.91	53.10	1,080.06	63.06	-16.15
Services	25,406.58	-551.37	24,577.01	1,435.01	829.57
Total	45,980.06	-703.68	45,979.68	2,684.68	0.39

Sources: Estimated from Shift-Share Model

In addition, the overall sub-period 2005 – 2007, shows that the regional proportion (RP) total is not much different from the value of national output. Value of RP (RM45,756 million) is able to be achieved if the total output expected in ECER grows parallel with the national output rate. This proved the facts that the economic development in ECER depends largely to the national growth. In addition, this study confirms the negative regional shift in this period which amounted to about 1 percent.

Table 5: Shift-share analysis ECER – Malaysia 2005 – 2007 (RM million in 2000 prices)

Sector	2005-2007				
	RP	RS	NS	NS*	IM
Agriculture	6,977.20	22.93	7,378.88	829.88	-401.69
Mining & quarrying	70.67	-2.66	78.87	8.87	-8.20
Manufacturing	11,911.25	324.96	12,209.13	1,373.13	-297.88
Construction	1,027.65	89.37	1,115.45	125.45	-87.80
Services	26,173.43	-1,318.00	24,972.60	2,808.60	1,200.82
Total	45,755.72	-478.94	45,754.94	5,145.94	0.78

Sources: Estimated from Shift-Share Model

6. ANALYSIS BY COMPONENTS

As earlier discussed, one of the advantages of shift-share models is that measurement can be done in a simple and straight-forward method. By the same token, using the RS component, the competitiveness of ECER as a region can be easily measured. The value of RS component shows the transition whether ECER have more regional advantages (positive values) or regional weaknesses (negative values) compared to the national economy. This is done by comparing between growth rates of output in one sector in ECER with that of the national level. For example, agriculture sector in ECER have expanded positively at the national level that caused the ECER regions getting positive regional share of RM23 million or 0.3 percent from real output achieved in 2007.

For the whole period, it was found that regional shift value is negative in mining & quarrying, and services sectors. This proves that the mining & quarrying sector, and services sectors in the ECER are experiencing deteriorating in its regional share with a negative value of about -4 percent, and -5 percent, respectively. Contradictally, the biggest positive regional share is construction (+8 percent), manufacturing (+3 percent), and agriculture (+0.3 percent). In all sub-periods of time, services sector is the only sector recording a negative regional share and losing its regional share of about -3 percent (2005 – 2006), -2 percent (2006 – 2007), and -5 percent (2005 – 2007), respectively.

Sub-period 2005 – 2006, and 2005 – 2007 experiencing the regional advantages with a positive value in RS for the three sectors (agriculture, manufacturing, and construction), while sub-period 2006 – 2007 experiencing deteriorating in RS especially in agriculture sector. In this sub-period, the regional disadvantages had caused ECER lost its regional share with a negative value of about -2 percent.

ECER regional output value in 2007 is expected to achieve the value of output as found in the RP column if the state can sustain its regional share. For example, if the agriculture sector maintained its regional share, then its output for 2007 will be RM6,977 million. If output of each sector in the ECER region is permitted to expand to the same level of the national GDP growth rate, then the level of output of 2007 is predicted as shown in column NS. For example, if agriculture sector is given to expand at a rate equal to the National GDP, its output in 2007 will be RM7,378 million.

Column NS* shows changes in sectoral output if it is assumed to expand as the national GDP growth rates. As such, agriculture sector's output will increase at about RM829 million if it is permitted to expand as the rate of national GDP growth. If the patterns in the industry mix is assumed at the national level is proportional to the ECER, output of each sector in this region in 2007 will experience positive increase or negative decline the amount found in IM column. Example, if ECER regions experienced industry mix as the national level in 2007, then the agriculture output of this region in 2007 will decline at an amount of RM402 million. The slowness of agriculture sector growth compared to national growth had caused the sector lost its regional share output and slowness of this can caused the output to decrease.

7. CONCLUSIONS AND POLICY RECOMMENDATION

The shift-share analysis is conducted to estimate whether ECER regions has an attractive location or not in the process of economic growth in the period 2005 – 2007. This is can be done by comparing the ECER regional economy with the national economy. The result shows that ECER regions are unattractive locationally to the investors in general. But, based on the results of the shift-share analysis analyzed for the period 2005 – 2007, using gross domestic product performance, it can be concluded that ECER regions was having fast economic growth and are able to be at the same level with other economic regions in Peninsular Malaysia particularly in agriculture, manufacturing, and construction sectors. This is due to the fact that these three sectors improved during the structural change at the national level.

In both sub-period 2005 – 2006, and 2006 – 2007, the results revealed that national share has the highest contribution to ECER growth, while the regional shift recorded the difference signs for both sub-periods, which is a positive value (2005 – 2006), and a negative value (2006 – 2007), respectively. On the different view, the services sector is the only sector recording a positive industrial mix for all sub-periods of time. This proves that the services sector in the ECER is experiencing an increase in output and recorded the fastest growth rate compared to national growth.

Therefore, for the planning purposes, the ECER regions need to concentrate on the low growth sector and improved the higher and potential growth sector. For instance, manufacturing sector has become main contributor to the ECER growth. Hence, the ECER's development authority should be improved infrastructure building such as roads and highways, supply of quality and quantity water that as required by manufacturing practices. Secondly, the agriculture sector should be given more attention for improvement. As a region that has resources in abundance, this sector should change its agriculture product composition through more commercial approach. This is inline with the strategies taken by ECER's development authority now to promote ECER regions particularly in manufacturing and agriculture sectors.

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