An Analysis Of The Industrial Development Potential Of Malaysia: A Shift-Share Approach

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ABSTRACT

The economy of Malaysia is diverse and the country is often referred to as a model of economic growth. As a young country, under able leadership and with a stable government, Malaysia soon established itself as a high growth economy of the world. The East Coast Economic Region (ECER) of Malaysia consisting of the provinces of Kelantan, Terengannu, Pahang and northern Johar has a different economic base and a unique industrial mix than other regions of the country. In addition to a plentiful endowment of natural resources, Malaysia has diversified its economy with a significant manufacturing component of high technology industries, medical technology and pharmaceuticals. The ECER in Peninsular Malaysia is rich in agricultural resources, rubber and fisheries. Additionally, tourism can be a rich contributor to the region's economic growth. The objective of this paper is to develop a Shift-Share model for analyzing the unique industrial mix of the ECER and its local competitiveness potential for economic development. The results thus obtained may shed a useful light on the potential of different economic sectors, with significant policy implications towards accelerating the economic growth of the ECER.

INTRODUCTION

Malaysia, as it is known today, was formed in 1963 when Malaya along with the then-British crown colonies of Sabah (British North Borneo), Sarawak and Singapore decided to unite in a sovereign federal state. The country's economy suffered in the early years due to conflicts against Indonesia and the Philippines, the eventual exit of Singapore from the Federation, and internal riots. In its formative years, Malaysia was known as a producer of raw materials, primarily rubber; however, since the 1970s, the country emerged into a multi-sector economy. Its government has been successful in creating a climate of domestic and foreign investments in high technology industries, medical technology, and pharmaceuticals. This has been possible because of the Government's continual efforts in boosting domestic demand to steer the economy off of its dependence on exports of raw materials. As a result, newer forms of exports, particularly of electronics have become a significant driver of the economy. Malaysia is an exporter of oil and gas, allowing the country to increase its earnings due to higher world energy prices. (https://www.cia.gov/library/publications/the-world-factbook/geos/my.html). Using the Shift-Share model, the economic performance of ECER in each of its major economic sector can be decomposed to analyze the growth occurring during a period of time. For the purpose of this research, growth in 11 economic sectors of Malaysia will be analyzed for the period 2000-2005. The choice of the beginning and end year was deliberately decided to analyze the sectoral growth of Malaysia's economy before launching of the National Development Agenda by the government in 2006. The Shift-Share model lends itself to the analysis of total growth in each economic sector as a composite of growth due to the national growth, growth due to the unique industrial mix of the region and growth attributable to the competitive share of the region. Results obtained for the 20001-2005 period may be compared to a later period growth rate with a view to evaluating the performance of the government's National Development Agenda.

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DATA AND METHODOLOGY

The Shift-Share model requires comparable data for both the national economy and the regional or local economy. This study utilizes national data of Malaysia's Gross Domestic Product (GDP) by industrial origin in 11 broad sectors and the national GDP. The following model decomposes the growth potential of GDP by industrial origin in 11 sectors. Because of the lack of regional data, growth potential is evaluated only for the national growth and unique industrial mix components. Once comparable data are available, the model may be extended to compute the local competitiveness component for comparative analysis.

THE SHIFT-SHARE APPROACH TO EMPLOYMENT GROWTH

Most studies on regional growth or employment growth typically use aggregate variables to explain the growth of GDP or employment in relation to population migration and real wages and income, yet part of the growth in an area occurs in response to local initiatives and the unique regional structure of a community. The Shift-Share approach is a relatively recent technique used in regional growth analysis which decomposes the growth of GDP, employment or income according to pre-determined characteristics. The following example provides an illustration of employment growth occurring in various communities. As Buck (1970) explains, the Shift-Share analysis recognizes that "the effect of a region's unique industrial structure on employment growth be isolated. The "shift" component of the technique measures the movement (or shift) of the local economy into faster or slower growth sectors, while the "share" component measures the larger or smaller share of the growth occurring in a given economic sector. This is done by separating the growth of employment in a particular sector into three components: the national growth (NG), the industrial mix (IM), and the competitive share (CS) components. The following definitions of the NG, the IM and the CS components, as applied to employment growth are adapted from Hustedde, Shaffer and Pulver (1984).

The national growth component measures the potential change in local employment, assuming the local economy is similar to the national economy. The national growth component is calculated by multiplying the base year employment in each sector by the national average employment growth rate, and then summing over all the sectors. The results show how many new jobs were created locally due to national economic trends, assuming the local and national economies are identical.

The second step in shift-share analysis is to compute the industrial mix component. The industrial mix component is determined by multiplying the local employment in each economic sector by the difference in the national growth rate for that sector and the growth rate for the whole economy. A positive industrial mix indicates that the majority of local employment is in sectors which are growing faster than national total employment. A negative industrial mix indicates just the opposite.

The competitive share component measures the ability of the local economy to capture an increasing (decreasing) share of a particular sector's growth. It is computed by multiplying the local employment in each economic sector by the difference in that sector's national and local growth rate. After doing this for all sectors, the results are summed to give the community share.

A positive competitive share indicates that the community gained additional jobs over those due to national growth and its industrial structure. This gain suggests that the community is more competitive (efficient) in securing additional employment than is the rest of the nation. It is important to examine the competitive share for both the community and particular sectors. Each yields different information. Symbolically,

$SS=NG+IM+CS$, and

$NG=\Sigma[(E_{oi})\delta]$;

where,

E_{oi} =Base year local employment in sector i;

i=1,2…k (number of sectors)
δ=National average employment growth rate;
$IM=\Sigma[(E_{oi})(\Omega_i-\delta]$;

where,

Ω_i =National employment growth rate in sector i;

and

$CS=\Sigma[(E_{oi})(\Omega_i-\beta_i)]$;

where,

β_I=local employment growth rate in sector i.

Leser (1951) had introduced the SS technique to analyze Scotland's industrial structure. Further works by Dunn (1960) and Perloff, et al. (1960) encouraged policy makers to use the tool in regional employment growth analysis. Some of the early applications of the shift-share analysis are found in Thirlwall (1967) and Brown (1968). Curtis (1972) has provided a somewhat modified version of the technique to suit rural development analysis. The technique is an empirical device which lends itself to further analysis after the components of employment growth have been isolated (e.g. Mondal, 1991; Mondal and Aki, 1986).

As an illustration, Mondal (2002-03) analyzed the growth of employment in California after the recession of the early 1990s with a view to decomposing the growth rate. In order to accomplish this objective, *County Business Patterns* data were collected for the years 1992 through 1998. Because of change of definitions of the data, the analysis was conducted for a five-year period from 1993 to 1997. The model works in the following way. Total employment growth of a county during 1993-1997 is decomposed into three components, namely NG + IM +CS. When added, the three components equal the growth of employment in a county. For example, Alameda County gained a total of 74,783 jobs during 1993 and 1997. This gain is decomposed as follows:

- Gain of 55,656 jobs due to national growth (average employment in the U.S. grew by 11.09% during 1993-1997)
- Loss of 16,411 jobs due to lower average growth rate of California's employment (on an average, California's total employment grew by 7.82% during 1993-97)
- Gain of 35,538 jobs due to local growth of Alameda County's employment attributable to the growth of its economy through local initiatives.

It should be noted here that because California's average employment grew at a lower rate than the national average employment growth, the IM component for all counties was negative. The focus, therefore, was on the CS component. Using the shift-share results, counties were identified on the basis of their growth of the CS component. It was hypothesized that some counties were more successful than other counties in attracting industries and creating employment. The results of the shift-share components demonstrated differential growth rate and the type of industries that created such employment.

GDP BY INDUSTRIAL ORIGIN: MALAYSIA, 2000-2005

The Government of Malaysia publishes annual GDP statistics by industrial origin. The national economy is divided into 11 sectors or industries: Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; Construction; Services; Electricity, gas and water; Wholesale and retail trade, hotels and restaurants; Transport, storage and communication; Finance, insurance, real estate and business services; Other services (includes community, social and personal services, private non-profit services of households and domestic service of households); and Government services. For accounting purposes, the GDP calculation also incorporates imputed

bank services, which are subtracted from the industrial contributions, and import duties, which are added to the industrial contributions. The total GDP of Malaysia thus computed was 210,557 million RM in 2000 which grew to 262,175 million RM in 2005, a growth of 24.51 percent in 5 years. The national economy grew at a healthy rate each year, except for 2001-2002, when the growth rate was a meager 0.3 percent. Services constituted the largest component of Malaysia's economy in 2000 contributing 54 percent to the GDP. Its contribution to Malaysia's GDP remained steady during 2000 and 2005 growing at an annual rate of between 6 and 7 percent, while the national GDP grew at an average annual rate of 4.9 percent during the same period. A number of industries grew at a rate which was lower than the national average GDP growth rate. During 2000-2005, the highest growth rate by industry was posted by the Finance, insurance, real estate and business services sector, which grew at an average annual rate of 10.08 percent, followed by Government services, which grew at an average annual rate of 7.9 percent; and Transport, storage and communications, which grew at an average annual rate of 7.34 percent. Sectors which posted a growth rate which was lower than the national average growth rate of GDP included Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; and Construction. Sectors which grew at or near the level of average annual national growth rate included Other services (community, social and personal services, private non-profit services of households and domestic service of households); and Wholesale and retail trade, hotels and restaurants.

The foregoing analysis provides a good description of Malaysia's economy in relation to the contributions made by the broad economics sectors. However, such an analysis does not lend itself to the decomposition of the growth based on the contributions of a region, a province, or an administrative division. One can intuitively infer that if an economic sector's annual growth rate is lower than the national average growth rate, that particular sector's potential contribution to the national GDP would be negative. Assuming that the growth rate in each sector emulates national growth, yet the performance of a particular sector or industry is negative, we can infer that the slack was taken up by the local economy, or that the local economy's competitive share more than offset the negative contribution in a certain sector. This type of analysis can only be performed when the national data are compared to the regional or provincial data.

The Shift-Share model discussed above was applied as a special case to the 11 economic sectors of Malaysia's national economy. In the absence of comparable data for disaggregated industry or the regional or provincial data, we are able to compute only two of the three components of the model, namely, the NG and the IM component. As will be shown below, the total growth in each sector will be a composite of the growth of the two components. The decomposition of the national data into these two components and the results are provided in Table 1:

Table 1: Malaysia's NG and IM Components by Industrial Origin, 2000-2005

Sector	Base Year (2000) GDP[1]	Growth Rate (%)	NG	IM
Agriculture, forestry and fisheries	18,662	15.88	4,574.06	-1610.53
Mining and quarrying	15,385	13.77	3,770.86	-1,652.35
Manufacturing	67,250	23.01	16,482.98	-1,008.75
Construction	6,964	2.43	1,706.88	-1,537.65
Services	113,408	34.53	27,796.30	11,363.48
Electricity, gas and water	8,278	31.35	2,028.94	566.22
Wholesale and retail trade, hotels and restaurant	31,116	23.60	7,626.53	-283.16
Transport, storage and communications	16,858	36.70	4,131.90	2,054.99
Finance, insurance, real estate and business services	26,755	50.42	6,557.65	6,932.22
Other services[2]	16,070	26.61	3,938.76	337.47
Government services	14,331	39.48	3,512.53	2,145.35

[1.] In 1987 constant prices (RM million)

[2.] Community, social and personal services, private non-profit services of households and domestic service of households

Source of GDP data: Ministry of Finance and Department of Statistics, Malaysia

The NG and IM components of Table 1 may be interpreted as "potential contributions" of the respective sectors to the GDP of Malaysia due to national growth and the unique industrial structure of a particular sector. As discussed above, of the 11 sectors, the IM component is negative in 5 sectors. It is because the growth rate of those 5 sectors was lower than the national average growth rate. The NG component is always positive since we assume that part of the growth in any sector is attributable to the national growth. Let us take 2 examples.

Example 1: During 2000-2005, the Finance, insurance, real estate and business services sector contributed 13,490 million RM to the GDP of Malaysia. Of this amount, 6,557.65 million RM was contributed by this sector due to national growth of the economy and 6,932.22 million RM was contributed by the unique industrial mix of the sector. These two components together account for the total growth. Because the third data point, either a disaggregated industry (such as insurance or real estate) or a regional or provincial economy component is absent, we could not compute the CS component.

Example 2: During 2000-2005, the Manufacturing sector contributed 15,474 million RM to the GDP of Malaysia. Of this amount, 16,482.98 million RM was contributed by this sector due to national growth of the economy, but the sector lost -1,008.75 million RM due to the industrial mix of the aggregated sector. These two components together account for the total growth. Because the third data point, either a disaggregated industry (such as automobile tire manufacturing) or a regional or provincial economy component is absent, we could not compute the CS component.

The CS component of the Shift-Share model is frequently interpreted as the "competitive advantage" of a region in its contribution to the national GDP, or the competitive advantage of a sub-sector within a broad sector to the total growth of that sector. For example, the above decomposition of Malaysia's GDP could be conducted for each of its 13 states and/or the federal territory with three components, city of Kuala Lumpur, Labuan, and Putrajaya. Alternatively, if the objective is to evaluate the employment or income growth in any of the five cities of Kelantan province (Kota Bharu, Kuala Krai, Gua Musang, Rantau Panjang, Tanah Merah and Tumpat), comparable data may be collected so that the income or employment in these cities are decomposed with a view to evaluating the local initiatives in each of these cities.

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

Using the Shift-Share model, this paper developed a model to decompose the growth of income or employment in the East Coast Economic Region of Malaysia consisting of the provinces of Kelantan, Terengannu, Pahang and Northern Johar. The author was able to obtain only the annual GDP data of 11 broad sectors of Malaysia. The objective was to demonstrate how growth of income or employment in a defined period might be decomposed into the National Growth, Industrial Mix and Competitive Share components. The shift-Share model requires data points for a beginning period and an end period for two comparables such as the national and regional economy, or the aggregated and the disaggregated industry. In the absence of data for either the regional economy or the disaggregated industry, the model was applied as a special case to decompose the GDP of Malaysia originating in 11 economic sectors. The Government of Malaysia has launched a National Development Agenda in 2006. An analysis of income and employment growth in the ECER immediately prior to the launching of the National Development Agenda will have profound policy implications towards understanding the growth process of the ECER. The results thus obtained may be compared to a similar study that may be conducted after the National Development Agenda terminates in 2011. The author recommends collection of disaggregated data for such a study.

AUTHOR INFORMATION

Dr. Wali I. Mondal is a Professor of Business at National University in San Diego, California where he also served as Interim Dean during March 2007 to June 2008. He obtained his Ph.D. from The Ohio State University and has been a full time faculty member for over 27 years. Professor Mondal has worked and consulted for many national and international organizations including the United Nations Development Program and the World Bank. He has taught in a number of universities in the United States, Bangladesh and New Zealand. During 1993-96, he was Chair of the Accounting, Economics and Business Education Department at Henderson State University in Arkansas. Professor Mondal's research areas include microcredit, entrepreneurship, microentrepreneurship and economic

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