MediaTrend 17 (1) 2022 p. 250-262
Media Trend
Berkala Kajian Ekonomi dan Studi Pembangunan
http://journal.trunojoyo.ac.id/mediatrend

Sources of East Java Economic Growth 2000-2010 Period: Structural Decomposition Analysis

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Article Information

History of article:
Received March 2021
Approved March 2022
Published March 2022

A B S T R A C T

The purpose of this study was to determine the sources of economic growth in East Java using structural decomposition analysis. The study period is divided into two periods, namely the initial period (2000-2006) and the final period (2006-2010). The results show in the early period indicate that changes in final demand are the main determinants of economic growth in almost all sectors of the East Java economy, while changes in production structure (technology effects) tend to have negative effects on growth in almost all sectors other than services. In the final period, improvements to the production structure in almost every sector were able to make a positive contribution to output. Among the final demand categories, the largest output growth came from exports (between provinces) in the initial period, while in the final period the main source of growth shifted to household consumption. These findings indicate that East Java has the potential for large economic growth through inter-province exports with the support of improved production structures, particularly in the manufacturing sector.

Keywords: *Structural Decomposition Analysis, input-output, East Java, output*
JEL Classification Code*: C67, F63, O18*

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DOI: http://dx.doi.org/10.21107/mediatrend.v17i1.10096

INTRODUCTION

Indonesia's economic growth after the 1997/98 crisis was dominated by commodity exports, such as coal, crude palm oil, and petroleum as an implication of the high demand for international commodities. This boom in commodity exports helped Indonesia to double its Gross Domestic Product (GDP) from US$580 billion to US$1.1 trillion between 2001 and 2012 (World Bank, 2014). Although the Indonesian economy achieved significant growth, this growth has not yet taken advantage of the potential for more significant growth through the export of value-added products.

Indonesia's dependence on raw commodity exports causes two main problems, namely the increased damage to natural resources and the risk of a middle-income trap. East Java Province itself is not a producer of Indonesia's leading export commodities, but its economic growth is able to exceed the national economic growth after 2012 (Bank Indonesia, 2014).

The sources of growth in the Gross Domestic Product (GDP) in East Java during the period 2000 to 2010 mainly came from the service sector, industry (especially the manufacturing industry), and agriculture (Bank Indonesia, 2011). The potential for much greater economic growth is possible through these three sectors by relying on household consumption and export-oriented economic development.

The process of economic transformation that occurred in the economic structure of East Java after the national economic crisis could serve as an example for the economic development planning of other provinces in Indonesia by not relying solely on the exploitation of natural resources. The purpose of this study was to determine the pattern of economic transformation in East Java during the post-crisis recovery period 1997/98 and to determine the role of agriculture during the transformation period.

Structural Decomposition Analysis is used for this purpose by using input-output data for 2000, 2006, and 2010. In this analysis, the researcher uses the effect of technological change, which describes the effect of technological change on changes in output and the effect of changes in the final demand structure effect on changes in output.

Various studies on structural decomposition analysis have been carried out. Research at the national scope, among others, was conducted by Zuhdi (2012) and Zuhdi et al. (2011) and Zuhdi (2005) who decompose the output of the information technology sector, creative industry sector, and energy sector to determine changes in the final demand structure. Jacob (2003) also uses the same analytical tool to find out the sources of changes in Indonesia's economic structure which transformed from an agrarian country to industrialization the period 1985 to 2000.

The beginning of research with this analysis can be found through the work of Martin and Holland (1992) which also decomposes changes in the United States output in determining changes in technology and the final demand structure (including changes in the structure of imports). The development of this method within the input-output framework was then further developed by Dietzenbacher et al. (2000); Dietzenbacher and Hoekstra (2000); Dietzenbacher and Los (1998). Various variations of decomposition equations also develop from an additive equation to multiplication by utilizing various indices, such as the results of studies from de Boer (2009) and many others. This structural decomposition method has many variations considering the unique form of the equation that can be used. Researchers can modify these equations according to their research objectives with ordinary algebraic matrices.

The linear nature of the input-output framework makes it easy to match with

other variables as coefficients that depend on changes in output. For example, this analytical method can be used to analyze changes in the workforce structure using labor coefficients (Doan & Long, 2019; Hoekstra & van der Bergh, 2003; Incera, 2017; Madariaga, 2018) and various environmental impact analyses (Cazcarro et al. al., 2013; Henriques et al., 2015; Wang et al., 2013).

In an open and static input-output model, the transactions used in the preparation of the input-output table must meet three basic assumptions or principles, namely:

1. Uniformity (Homogeneity)

Uniformity is meant that output is only produced singly, which means that each economic sector only produces one type of goods and services with a single input arrangement (uniform) and there is no automatic substitution of inputs from different sector outputs.

2. Proportionality

That is the principle that the relationship between input and output in each production sector is a linear function, meaning that the increase and decrease in the output of a sector will be proportional to the increase and decrease in the input used by that sector.

3. Addition

That is an assumption that the total effect of the production activities of various sectors is the sum of the effects on each activity.

Several other limitations found in the input-output model include:

1. The input coefficient (technical coefficient) is constant during the research or projection period so that the technology used by economic sectors in production is considered constant. As a result, changes in the quantity and price of inputs will always be proportional to changes in the quantity and price of output;

2.The model is static so it is not able to capture various variations in output changes caused by effects outside the variables that make up the input-output framework,

3. The more aggregations carried out on the existing sectors, the greater the tendency to violate the homogeneity assumption, and the more detailed economic information will not be revealed in the analysis.

METHODOLOGY

This study uses additive structural decomposition by adopting the equation by Miller and Blair (2009). Changes in output that occurred during the period 2000 to 2010 will be broken down according to the determinants of technological change and changes in the final demand structure. East Java's economy in the span of ten years is divided into two periods, namely the period 2000-2006 and the period 2006-2010 according to the availability of input-output tables published by BPS East Java. Aggregation is done to equalize the differences in sector names that are always changing in each input-output table.

The decomposition equation in this study is based on equation (1) which is modified as follows:

$$\Delta \boldsymbol{X} = \tfrac{1}{2}\,\Delta \boldsymbol{L}\,(\boldsymbol{f_0} + \boldsymbol{f_1}) + \tfrac{1}{2}\,(\boldsymbol{L_0} + \boldsymbol{L_1})\Delta \boldsymbol{f} \quad (1)$$

Δx is the change in output; ΔL is the Leontief inverse matrix change; f_0 and f_1 is the demand vector at the end of the initial period and the end of the period. The first term of equation (1), that is $1/2\ \Delta L\ (f_0 + f_1)$ shows the determinants or effects of technological change contained in the ΔL. $1/2\ (L_0 + L_1)\Delta f$ shows the determinant or effect of changes in the existing final demand structure on changes in the final demand vector Δf.

Then decompose the effect of technological change and the effect of changes in final demand into smaller effects or determinants. On the determinants of technological change, the final result of the decomposition equation is as follows.

$$\frac{1}{2}\Delta L\,(f_0 + f_1) = \frac{1}{2}\,(L^1\,\Delta A^{(1)}\,L^0)(f_0 + f_1) + \ldots$$
$$+ \frac{1}{2}\,(L^1\,\Delta A^{(n)}\,L^0)(f_0 + f_1) \quad (2)$$

ΔA shows the difference that exists in the n- sector, while the elements of the other matrix A are zero.

$$\frac{1}{2}\,(L_0 + L_1)\Delta f = i'\left[\frac{1}{2}\,\Delta f\,(B^0\,\hat{d}^0 + B^1\,\hat{d}^1)\right] +$$
$$i'\left[\frac{1}{2}\,(f^0\,\Delta B\,\hat{d}^1 + f^1\,\Delta B\,\hat{d}^0)\right] +$$
$$i'[\tfrac{1}{2}\,(f^0\,B^0 + f^1\,B^1)\Delta\hat{d}] \quad (3)$$

where f is the total final demand in the form of a scalar; d is a distribution vector containing elements in the form of a ratio between the total final demand by category to f; B is a bridge matrix whose elements are the ratio between the final demand matrix F to the diagonal matrix of the total final demand by category; and i' is the addition vector.

The first term is the final demand level effect which explains changes in output that occur due to changes in the quantity of final expenditure. In general, economic sectors will tend to have a large level-effect value than other effect values. This indicates that a sector is very sensitive to changes in the final quantity demanded (Dietzenbacher & Hoekstra, 2000). The second term shows the final demand mix effect, which is a vector value that will explain how the combination in the final demand category will affect the amount of output produced. For example, for the household final demand category, the combined size of household consumption of computer use and computer repair services will affect the output of the computer-producing sector and the service sector. While the third term shows the final demand distribution effect, which is a vector of values that explains the effect of changes in the proportion of expenditures in each category of final demand on changes in output that occur.

The data used in this study is a table of input-output East Java total transactions based on producer prices in 2000, 2006, and 2010 published by the Central Statistics Agency (BPS) of East Java.

RESULT AND DISCUSSION

East Java has experienced a significant increase in GRDP between 2000 and 2010, although it experienced a slowdown in 2008-2009 as a result of the global financial crisis that occurred in the same year. East Java showed rapid economic improvement in line with the improving global economy, where this growth was also driven by an increase in domestic consumption and absorption of provincial and regional government budgets (East Java Provincial Statistics Center, 2012). Until 2014, the economic structure of East Java was still dominated by the manufacturing, services, and agriculture sectors in 2000, while the source of East Java's GRDP growth in 2014 came from the processing industry, services (wholesale and retail trade as well as car and motorcycle repair) as well as the construction sector (Central Bureau of Statistics, 2015).

A comparison of changes in output during the study period explains that the industry-based sector grew rapidly in the 2006-2010 period where the food and beverage industry sector (code 7) grew 150 trillion rupiahs, other industrial sectors (code 10) grew 193.4 trillion rupiahs, the construction sector (code 10) grew code 14) grew 120.18 trillion rupiahs, and oil and mining (code 16) grew 40.51 trillion rupiahs, and the food crops sector (code 1) grew 50.94 trillion rupiahs. This growth rate exceeds the achievement of sectoral output growth for the period 2000-2006. Meanwhile, the service sector (code 13) and trade (code 15) experienced slower growth in the second period, after previously leading economic growth in the 2000-2006 period.

East Java's output growth by final demand category in the first period (2000-

2006) came from an increase in inter-provincial exports (174.406 trillion rupiahs), followed by the household consumption category (124.757 trillion rupiahs). The decline in output in the overseas export category was caused by weak demand in East Java's main markets, such as China, India, the United States, and other importing countries (East Java Provincial Government, 2006). Export dependence of several importing countries needs to be addressed through market expansion to other countries in addition to increasing the diversification of export goods, given the risk of weakening export demand that could exacerbate output growth in East Java. Meanwhile, during the 2000-2006 period, East Java also experienced a decline in investment (both foreign and domestic), as indicated by the contribution of changes in output to minus 17.18 trillion rupiahs from the Gross Fixed Capital Formation category.

This condition then changed in the second period when the source of East Java's output growth shifted from previously being based on inter-provincial exports to household consumption as the main source of growth, with a total value of 379,342 trillion rupiahs. the increase in household consumption to output growth cannot be separated from the increase in GDP per capita since 2000 in East Java (East Java Provincial Government, 2014). Meanwhile, the weakening of inter-provincial exports in this period stemmed from a decrease in the final demand group expenditure ratio, namely the ratio of inter-provincial exports to total aggregate final demand in East Java. Foreign exports alone increased their contribution to output growth in the second period, but have not been able to increase the increase in output from inter-provincial exports. The decline in foreign export performance stemmed from a decrease in consumption of final demand variations in this category, which was around minus 10.29 trillion rupiah due to several significant impacts from the global economic crisis in 2008. However, state investment in East Java itself increased during this period. This increase in output contributed to 215.47 trillion rupiahs.

The findings on a sector-by-sector basis in the initial period show that the services and trade sectors are the main sectors driving economic growth in Java (Table 1). the growth of the sector itself is dominated by the plant sector in line with East Java's efforts to become a national food barn (World Bank, 2012a). Other industrial sectors were also identified as key to economic growth during this period, along with the cigarette and tobacco industry, while the food and beverage industry experienced a decline in output in the first period due to household consumption in East Java and weak performance in foreign exports, which was a negative determinant of change. the final mix-effect demand in this sector. The output that occurs in the industrial sector in a broad sense (including agro-industry and manufacturing) actually experiences a decrease in changes in final consumption (shown by the same negative determinant), but most sectors are able to increase this growth by increasing other determinants of changes in final demand (level-effect and distribution-effect).

During this period, the central government decided to increase the price of fuel oil (BBM) in 2005 which led to an increase in various basic commodities followed by a policy of increasing cigarette prices (East Java Provincial Government, 2006). The increase in fuel prices is the reason why all non-service sectors experience a decline in performance on their respective inputs, as was done in these sectors, it is necessary to make adjustments to production costs, while the service sector is easier to make price adjustments. The service and trade sectors as well as the non-industrial and non-agricultural sectors have positive inputs to output (techno-

logical effects) amid government policies that have raised several prices for fuel oil (BBM). Although the agricultural and industrial sector groups (including agro-industry) tend to be under pressure from the performance of the growth in the input structure, the source of output growth from changes in the final demand structure still provides the largest contribution.

If we look at changes in the sectoral output according to each category of final demand, it can be seen that the output growth in the services sector (code 13) and trade (code 15) was driven by strong domestic consumption and exports, particularly exports between provinces (Table 2). It can be seen that when Indonesia began to recover after the 1997/98 crisis, East Java gained momentum to recover its regional economy by expanding domestic trade between provinces. This is possible because East Java has a comparative and competitive advantage in meeting the needs of the inter-provincial market, especially for food products. When East Java began to experience economic improvement from the inter-provincial trade category, growth in the PMTB category experienced a significant decline due to investment preferences at that time being focused on West Java and Jakarta.

On the other hand, the agricultural sector group (sector codes 1 to 6 in Table 2) generally experienced growth in output originating from household consumption and inter-provincial exports. Among the agricultural sector groups that produce positive output from inter-provincial exports, it is known that the plantation sector in East Java is the sector with the largest output contribution in this category (10.5 trillion rupiah) followed by the livestock sector (5.09 trillion rupiah). Meanwhile, the output value based on foreign export categories mostly decreased due to non-tariff barriers with high product quality standards required in several export destination countries (East Java Provincial Government, 2006).

The large role of exports, especially inter-provincial exports in East Java's final demand structure, is the main factor supporting economic growth. Jacob (2003) explained that the Indonesian economy, which previously relied on economic growth by strengthening export-based industries, was able to release its dependence on oil exports and encourage higher economic growth compared to relying solely on exports of crude oil. This is in line with Hill's (2001) observation which emphasizes the importance of inter-regional (provincial) trade for the sake of strong economic integration, while also supporting the economic growth of each region. It is the same with Indonesia, which in the early days of its recovery relied heavily on export commodities to support early economic growth.

In the second period (2006-2010), improvements in the sectoral input structure of East Java can be seen from the positive values for each of the determinants of technological change that have contributed to output growth (Table 3). Most of the industrial sector groups along with the agricultural sector experienced improvements in their input structure in line with adjustments in production costs as a result of the increase in fuel prices, while the service sector (excluding trade) experienced a decline in its input structure, causing a decline in service sector output compared to the previous period. amounting to 66.86 trillion rupiahs. The economic condition of East Java also seems to have made some progress, which can be seen from the increase in the average number of sectoral output contributions compared to the period 2000-2006. The global economic slowdown due to the 2008 crisis had an impact on East Java's economic performance so that foreign exports were not yet fully optimal (East Java Provincial Government, 2014).

The construction sector itself in this period experienced a significant change in output compared to growth in the pre-

vious period. This sector has transformed into the third-largest economic driver in East Java with a growth achievement of up to 120.18 trillion rupiahs. This growth is driven by the positive influence of all existing determinants, but the biggest trigger comes from the high ratio of final demand expenditure in this sector (44.18%) where Gross Fixed Capital Formation (PMTB) is the main source of growth. The increase in PMTB during this period stemmed from the provincial government's policy of starting the expansion of regional development by improving and developing its infrastructure, especially for roads and government facilities.

The service sector (code 13) and trade (code 15) experienced weakening output growth due to the decline in the export performance of the two sectors, as shown in Table 4. Despite pressure from the export group, the changes in the output of the two sectors received appreciation from the impact of the increase. household consumption. Government consumption also contributed to the service sector amounting to 22.07 trillion rupiahs, where this influence stemmed from an increase in total expenditure in line with an increase in the proportion of government spending. Since 2006 and 2010, the provincial government also does not consume sectoral products in various amounts, so the mixed effect value becomes 0 (zero). Nevertheless, infrastructure development which continues to grow along with the improvement in government performance in public services since the implementation of regional autonomy has been able to maintain output growth in East Java (World Bank, 2012b).

The agricultural sector group also experienced output growth thanks to the improving performance of foreign exports during this second period, although exports between provinces apparently put pressure on output growth, especially in the food crops sector (code 1), plantations (code 2), horticulture (code 3), and forestry (code 5). Household consumption itself still plays an important role in output growth in this sector group, but in the food crops sector, there is a decrease in the effect of changes in output relative to the same effect in this category in the first period, reaching 48.003 trillion rupiahs. A further review of inter-provincial export performance for the agricultural sector group shows that there is pressure from a decrease in the variation in consumption of export products between provinces in this sector, but this decline is dominated by the effect of a decrease in the proportion of exports between provinces along with a decrease in the same effect in the household consumption category.

The food and beverage industry sector (code 7) experienced an increase in output from the household consumption and export categories (inter-provincial and overseas), which was the largest increase after the first period. The output growth of the cigarette and tobacco sector itself (code 8) experienced a shift from the 2000-2006 period, were in this period household consumption dominated its sectoral growth in line with foreign exports which increased significantly. The performance of exports between provinces itself experienced a decline so it suppressed output to minus 44.033 trillion rupiahs.

CONCLUSIONS

In general, East Java was able to achieve higher output growth in the second period compared to its output growth in the initial period. There are several notes to note that the source of East Java's economic growth in the second period is highly dependent on household consumption. Total export share declined during this period, but has shifted to positive overseas exports with a significant decline in exports between provinces. Compared to the initial period, total exports, especially inter-provincial exports, became the main source of

economic growth, followed by household consumption. The overall analysis concludes that East Java did not fully exploit its economic potential during the study period. This can be seen from the discrepancy of each of the determinants of growth as in the initial period. While exports are the main source of growth, the majority of input structures do not fully support this opportunity (with negative technological determinants in almost all non-service sectors). In the following period, when the production structure made a positive contribution to output, inter-provincial exports declined while foreign exports were still unable to offset the decline. The agro-industrial and manufacturing sectors need to be encouraged because East Java has great potential to develop its economy as a trade center for Eastern Indonesia and Western Indonesia.

REFERENCE

Badan Pusat Statistik. (2015). Laju Pertumbuhan PDB/PDRB. Sistem Informasi Rujukan Statistik (SIRUSA). http://sirusa.bps.go.id/sirusa2012/index.php?r=indikator/view&id=3

Badan Pusat Statistik Provinsi Jawa Timur. (2012). Produk Domestik Regional Bruto Jawa Timur Menurut Lapangan Usaha.

Bank Dunia. (2012a). Analisa Pengeluaran Publik Jawa Timur 2011.

Bank Dunia. (2012b). Analisis Keuangan Publik Jawa Timur 2011: Mengoptimalkan Pengelolaan Keuangan Daerah untuk Pertumbuhan yang Inklusif.

Bank Dunia. (2014). Indonesia: Menghindari Perangkap.

Bank Indonesia. (2011). Kajian Ekonomi Regional Jawa Timur Triwulan III - 2011. Bank Indonesia Wilayah IV.

Bank Indonesia. (2014). Kajian Ekonomi Regional Jawa Timur Triwulan I - 2014. Bank Indonesia Wilayah IV.

Cazcarro, I., Duarte, R., & Sánchez-Chóliz, J. (2013). Economic growth and the evolution of water consumption in Spain: A structural decomposition analysis. Ecological Economics, 96(June), 51–61. https://doi.org/10.1016/j.ecolecon.2013.09.010

de Boer, P. (2009). Multiplicative decomposition and index number theory: An empirical application of the Sato - Vartia decomposition. Economic Systems Research, 21(2), 163–174. https://doi.org/10.1080/09535310902937638

Dietzenbacher, E., & Hoekstra, R. (2000). The RAS Structural Decomposition Approach. 1–33.

Dietzenbacher, E., Hoen, A. R., & Los, B. (2000). Labor productivity in Western Europe 1975-1985: An intercountry, interindustry analysis. Journal of Regional Science, 40(3), 425–452. https://doi.org/10.1111/0022-4146.00182

Dietzenbacher, E., & Los, B. (1998). Structural Decomposition Techniques: Sense and Sensitivity. Economic Systems Research, 10(4), 307–324. https://doi.org/10.1080/09535319800000023

Doan, H. T. T., & Long, T. Q. (2019). Technical Change, Exports, and Employment Growth in China: A Structural Decomposition Analysis. Asian Economic Papers, 18(2), 28–46. https://doi.org/10.1162/asep_a_00690

Henriques, C. O., Coelho, D. H., & Cassidy, N. L. (2015). Employment Effects of Electricity Production From Renewable Energy in Portugal – An IO LCAApproach.

Hill, H. (2001). Ekonomi Indonesia (T. W. B. Santoso & H. Susilo (eds.); Edisi Kedu). PT. Raja Grafindo Persada.

Hoekstra, R., & van der Bergh, J. J. C. J.

M. (2003). Comparing Structural and Index Decomposition Analysis. Energy Economics, 25(1), 39–64. https://doi.org/10.1016/S0140-9883(02)00059-2

Incera, A. C. (2017). Drivers of change in the European youth employment: a comparative structural decomposition analysis. Economic Systems Research, 29(4), 463–485. https://doi.org/10.1080/09535314.2017.1316708

Jacob, J. (2003). Structural Change , Liberalisation and Growth : The Indonesian Experience in an Input-Output. October, 31–40.

Madariaga, R. (2018). Factors driving sectoral and occupational employment changes during the Spanish boom (1995–2005). Economic Systems Research, 30(3), 400–421. https://doi.org/10.1080/09535314.2018.1474182

Martin, R. P., & Holland, D. (1992). Sources of Output Change in the U.S. Economy. Growth and Change, 23(4), 446–468. https://doi.org/10.1111/j.1468-2257.1992.tb00944.x

Miller, R. E., & Blair, P. D. (2009). Input-Output Analysis: Foundations and Extensions (2nd ed.). Cambridge University Press.

Pemerintah Provinsi Jawa Timur. (2006). Rencana Pembangunan Jangka Menengah Daerah (RPJMD) Provinsi Jawa Timur Tahun 2006-2008.

Pemerintah Provinsi Jawa Timur. (2014). Rencana Pembangunan Jangka Menengah Daerah (RPJMD) Provinsi Jawa Timur 2014-2019.

Wang, Y., Zhao, H., Li, L., Liu, Z., & Liang, S. (2013). Carbon dioxide emission drivers for a typical metropolis using input–output structural decomposition analysis. Energy Policy, 58, 312–318. https://doi.org/10.1016/j.enpol.2013.03.022

Zuhdi, U. (2005). Analyzing the Gross Output Change of Energy Sector Industry in Indonesia between 1990 and 2005 by Decomposition Analysis Tokyo University of Science , Japan. 1–10.

Zuhdi, U. (2012). Analyzing the Influence of Creative Industry Sector to the National Economic Structural Changes by Decomposition Analysis: The Case of Indonesia. Procedia - Social and Behavioral Sciences, 65, 980–985. https://doi.org/10.1016/j.sbspro.2012.11.230

Zuhdi, U., Utomo, D. S., & Alamanda, D. T. (2011). Analyzing the Role of ICT Sector to the National Economic Structural Changes: the Case of Indonesia. Jurnal Manajemen Teknologi, 10(3).

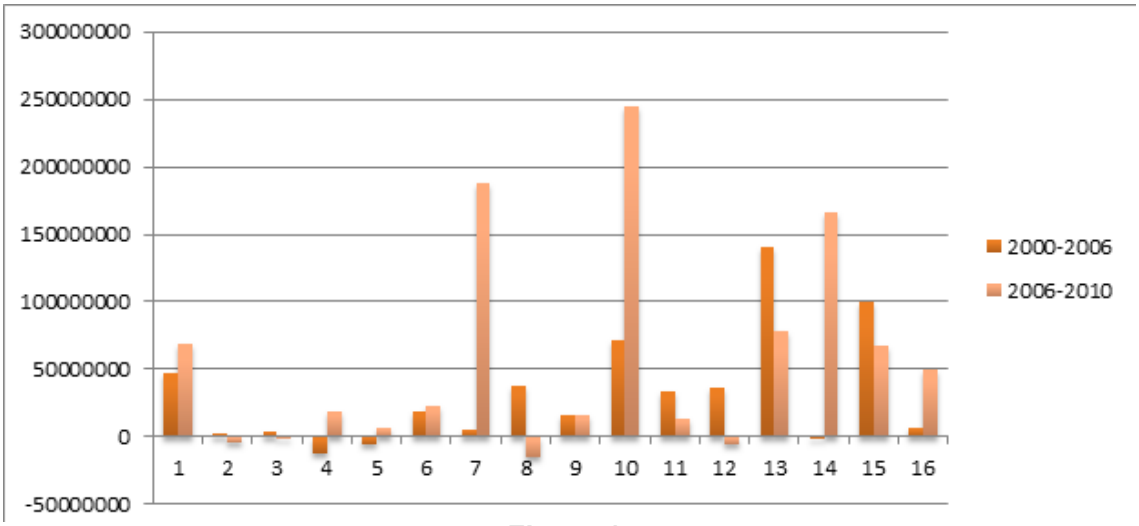

Figure 1.
Comparison of changes in sectoral output in the two study periods.

Table 1.
Decomposition results for the period 2000-2006

Code	Sector	Δ Output	Lev-Effect	Mix-Effect	Dis-Effect	Tech-Effect
1	Crops	41,330,803.56	33.13%	21.40%	29.96%	15.51%
2	Plantation	6,107,831.75	204.76%	-220.99%	107.18%	9.05%
3	Horticulture	3,400,888.47	71.42%	33.45%	22.06%	-26.93%
4	Livestock	-13,768,756.29	73.25%	-77.09%	-7.60%	-88.56%
5	Forestry	-10,137,906.54	33.29%	-49.16%	-1.68%	-82.45%
6	Fishery	12,906,706.58	35.31%	77.28%	9.15%	-21.74%
7	Food and beverage industry	-6,437,564.55	340.72%	-525.93%	26.89%	58.31%
8	Tobacco industry	19,696,568.41	128.10%	-34.31%	73.71%	-67.50%
9	Other agro industry	4,905,123.06	527.08%	-98.93%	-162.22%	-165.93%
10	Other industries	43,096,686.05	124.89%	-30.16%	-31.01%	36.28%
11	Transportation	22,145,448.34	41.19%	93.50%	-1.59%	-33.11%
12	Finance	29,634,770.06	14.19%	27.01%	0.40%	58.41%
13	Service	110,762,000.50	38.02%	32.77%	-0.98%	30.18%
14	Construction	-3,435,089.70	355.16%	-283.80%	-443.71%	272.35%
15	Trade	90,239,411.39	36.63%	39.24%	-5.67%	29.80%
16	Mining and oil and gas	4,349,224.83	129.42%	-181.41%	31.34%	120.65%

Table 2.
Changes in output originating from changes in the demand structure at the end of the 2000-2006 period

Code	Household Consumption	Government Consumption	PMTB	Stock Change	Export LN	Export AP
1	48,003,080.70	349,535.50	26,956.66	-17,244,994.18	-530,625.92	4,316,681.54
2	-4,227,295.39	400,076.84	-14,551.64	1,424,119.15	-2,528,046.27	10,500,903.53
3	4,663,056.37	219,993.22	20,516.13	-105,404.38	57,801.75	-539,158.23
4	-10,019,661.50	975,120.41	4,117,501.41	-671,153.63	-1,067,745.51	5,091,278.53
5	222,095.34	-63,336.00	-517,985.82	1,218,000.90	-1,746,617.43	-891,039.81
6	11,641,333.18	212,988.67	-17,407.26	295,624.47	-72,027.92	3,651,965.31
7	-3,539,557.20	415,527.67	66,684.97	6,930,257.83	-12,426,738.16	-1,637,776.59
8	-2,136,857.81	80,201.91	5,892.27	1,613,842.04	-684,547.96	34,112,430.88
9	155,589.64	-622,082.56	-5,171,925.74	8,542,123.12	-9,217,350.38	19,357,946.52
10	4,990,319.30	-1,996,319.56	-16,329,093.42	39,794,770.26	-26,564,986.45	27,567,835.01
11	17,929,485.84	-198,071.64	1,377,682.38	1,039,891.32	-115,502.20	9,443,948.86
12	8,771,225.47	226,521.96	71,051.12	392,057.84	-513,582.26	3,379,072.55
13	18,325,302.29	20,657,576.09	1,718,511.57	1,769,620.14	5,501,983.62	29,356,967.25
14	-3,201,398.18	-1,335,102.03	-9,078,955.83	96,389.98	-93,433.00	821,790.00
15	35,710,568.61	103,372.04	7,296,409.91	274,964.53	-9,078,572.65	29,040,901.13
16	-2,529,287.34	-12,379.27	-751,260.20	2,676,158.86	-1,114,454.35	832,913.78

Table 3.
Decomposition results for the period 2006-20106

Code	Sector	Δ Output	Lev-Effect	Mix-Effect	Dis-Effect	Tech-Effect
1	Crops	50,940,608.43	76.86%	-44.87%	5.06%	62.95%
2	Plantation	-7,199,589.03	271.61%	-338.75%	-106.49%	73.63%
3	Horticulture	-1,136,223.74	378.01%	-542.38%	54.88%	9.50%
4	Livestock	11,418,390.16	124.56%	-15.55%	33.88%	-42.90%
5	Forestry	4,134,964.18	88.33%	20.02%	-30.62%	22.27%
6	Fishery	19,814,568.43	65.12%	-5.44%	2.82%	37.51%
7	Food and beverage industry	150,062,191.00	37.02%	49.70%	-3.32%	16.60%
8	Tobacco industry	-11,358,826.66	365.93%	-252.94%	-237.25%	24.26%
9	Other agro industry	12,214,982.37	342.66%	-217.00%	-166.63%	140.98%
10	Other industries	193,408,242.70	63.26%	40.02%	-7.45%	4.18%
11	Transportation	24,141,384.72	94.49%	-48.09%	4.20%	49.40%
12	Finance	-4,575,218.43	267.63%	-128.31%	14.78%	-254.10%
13	Service	66,860,731.97	149.61%	-10.58%	17.02%	-56.06%
14	Construction	120,180,721.20	30.77%	22.86%	44.18%	2.19%
15	Trade	47,238,706.62	165.65%	-90.37%	18.09%	6.64%
16	Mining and oil and gas	40,510,806.29	37.87%	16.82%	-2.15%	47.46%

Table 4.
Changes in output originating from changes in the demand structure at the end of the 2006-2010 period

Code	Household Consumption	Government Consumption	PMTB	Stock Change	Export LN	Export AP
1	17,886,450.91	859,705.80	513,982.66	3,444,688.15	253,279.08	-4,083,138.77
2	5,250,762.32	296,335.91	339,234.10	-1,533,459.55	1,642,651.14	-18,496,043.66
3	-1,007,431.08	141,873.68	53,258.12	63,040.28	304,593.53	-799,501.22
4	4,970,428.96	486,812.47	5,347,135.80	1,642,352.73	1,428,596.25	2,441,779.02
5	4,078,186.78	59,448.60	704,479.52	-535,760.58	-523,742.96	-568,598.66
6	3,051,229.34	317,952.35	123,794.79	-176,930.62	7,095,023.83	1,971,628.48
7	79,865,930.51	1,144,578.44	874,166.09	-4,754,868.90	17,753,930.66	30,262,275.43
8	26,820,010.91	83,011.83	28,090.72	-970,859.11	3,958,976.60	-44,033,390.21
9	8,769,893.30	802,295.87	10,023,678.53	-5,864,763.40	-15,819,744.30	-2,916,475.11
10	84,269,534.89	2,500,537.01	44,047,748.74	-26,267,888.29	49,306,436.13	31,472,621.50
11	6,441,025.40	614,390.35	3,577,499.79	-718,195.40	2,667,283.95	-367,063.95
12	5,336,095.25	489,815.00	2,710,004.09	-409,143.67	572,478.06	-1,648,789.75
13	95,380,935.49	22,073,601.22	7,024,819.55	-1,304,240.41	-6,691,813.48	-12,140,443.95
14	10,852,036.18	547,130.05	106,483,890.17	-182,065.55	419,584.79	-573,796.30
15	21,301,114.28	1,823,152.17	24,478,952.43	-1,791,734.63	8,459,291.79	-10,167,007.99
16	6,075,894.72	272,600.66	9,144,684.84	-2,330,074.76	11,790,310.70	-3,668,741.48