The Impact of Price Changes on the Poor in Nanggroe Aceh Darussalam Province, Indonesia:

A Case Study on Oil Prices

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*In memory of my mother (**the late Hj. Nursyiah**) and father (**the late H. M. Daud. A**) who passed away in the biggest Earthquake and Tsunami Catastrophe in Aceh, December 26th, 2004 together with my sister, brother, nephew, aunt, uncle, cousins, brother in law and his family, and relatives.*

To Yossi, Azzam, Fyaniaqil

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AAF	ASEAN Aceh Fertilizer
ABRI	National Army of Republic Indonesia
ACGE-IM	Applied Computable General Equilibrium INDORANI Model
AD	Aggregate Demand
ADB	Asian Development Bank
AEP	Average Expenditure Propensity
APBN	National Income and Expenditure Budget
ALNG	Arun Liquefied Natural Gas
AS	Aggregate Supply
ASEAN	Association of South East Asia Nations
BAPPEDA	Aceh Regional Development Planning Board
BL	Backward Linkage
CBS	Central Bureau of Statistics
CD	Cobb-Douglas Production Function
CES	Constant Elasticity of Substitution
CET	Constant Elasticity of Transformation
CGE	Computable General Equilibrium
CPI	Consumer Price Index
DAA	Descriptive Analysis Approach
DAU	General Allocation Fund
DKI	Capital City of Indonesia
EMO	Exxon Mobil Oil
EIA	Energy Information Administration
FCGE	Financial Computable General Equilibrium
FL	Forward Linkage
FME	Factor Market Equilibrium
GAMS	General Algebraic Modeling System
GDP	Gross Domestic Product
GNP	Gross National Product
GOV	Balance of Government Budget
GPG	General Public Group
GRDP	Gross Regional Domestic Product
HIS	High-Scale Industry
HSDO	High-Speed Diesel Oil
IFPRI	International Food Policy Research Institute
INPRES	Presidential Instruction
KKA	Aceh Paper Mill
LM	Liquidity Preference Money Supply
LPG	Liquefied Petroleum Gas
MoU	Memorandum of understanding
MPC	Marginal Propensity to Consume
MPL	Marginal Product of Labor

MPS	Marginal Propensity to Save
NAD	Nanggroe Aceh Darussalam
NGO	Non Government Organizations
OPEC	Organization of the Petroleum Exporting Countries
OECD	Organization for Economic Cooperation and Development
ORANI-G	A General Equilibrium Model of the Australian Economy
PAD	Own Revenue Sources
PERTAMINA	State-owned oil company of Indonesia
PKPS-BBM	Compensation Program for Reduced Subsidies on Refined Fuel Oil
PLN	State-owned Electricity Company
PMT	Private Kerosene Company
PODES	Village Potential Data
PPI	Producer Price Index
ROW	Balance of Current Account with Rest of the World
SAM	Social Accounting Matrix
SDO	Subsidy for Autonomous Region
SI	Saving Investment Balance
SNA	Systems of National Account
SPBU	General Oil Filling Station
SUSENAS	National Socioeconomic Survey
TFP	Total Factor Productivity
TFP-F	Total Factor Productivity of Formal Labor
TFP-InF	Total Factor Productivity of Informal Labor
TL	Total Linkage
TP	Total Production
UNDP	United Nation Development Program
US	United State
UU	Regulation
VAR	Vector Autoregressive Model
WHO	World Health Organization

ABSTRACT

The phenomenon of oil prices increase due to oil subsidy reduction is a crucial and dilemmatic issue for developing countries such as Indonesia. This is because the magnitude of the resulting effects of rising oil prices is not merely related to the shrinkage of the government expenditure burden in the future, but also triggers off a set of negative consequences on all aspects of economic sectors. Moreover, it also directly or indirectly engenders a tricky situation on socio-economic households in term of welfare-reducing both in rural and urban regions. Most of the theoretical viewpoints are tightly highlighted that an increase in oil prices will induce elevated living cost for certain household groups in the society (the living standards of both poor and vulnerable household groups mostly at middle income households fall down). It implies that the impact of oil prices increase will concurrently push the inflation rate to a higher and higher level (spiral inflation), the purchasing power of households as indicated by the rate of households' real income worsens in the near future below a certain threshold (poverty line). At long last those with little income will be trapped into the poverty circle (vicious circle of oil prices increase). The households are openly vulnerable to be trapped into poverty and the poor who are already in the poverty trap will be the poorest (chronic poverty). There is an unambiguous relationship between oil prices increase as one of the urgent government policies and the households' real income decline. This study attempts to investigate the impact of oil prices increase on the poor at regional level in particular in Nanggroe Aceh Darussalam (NAD) province. To get an in-depth understanding of this issue, the study utilizes three approaches to capture the micro and macro impact of oil prices increase on the poor: the Descriptive Analysis Approach (DAA) supported by the primary data from field research, the Social Accounting Matrix (SAM) approach as well as the Computable General Equilibrium (CGE) model by comparing two periods of SAM data (2002 and 2005). It is also important to underline that the oil prices will be more focused on this study is solely three types of oil prices: gasoline, diesel, and kerosene prices.

Four specific conclusions of the study are as follows: (1) The main socio-economic characteristics of the poor being vulnerable to the oil prices increase are greater household size, profession as a farmer, lower education, and unskilled labor (2) Government's action to reduce subsidy on oil will generate oil stock scarcity which picks up the pace of the oil prices in the community exceeding the government oil price declaration throughout the scarcity; (3) The oil prices increase highly leads to inequality in income distribution across institutions as indicated by the different accounting multiplier and the real income alteration of institution, particularly rural and urban households which is caused by larger indirect effect than direct effect. (4) In general, the depressing shock of the oil prices increase highly affects real income of all household groups in urban areas, but at the end of the impact process it will be negatively experienced by the households in rural areas through higher inflation rate, especially the poorest and poor households. Afterwards, they are openly trapped into chronic poverty. In addition, rural middle-income households are more vulnerable to poverty than those in urban areas. Therefore, these are key reasons why the poverty rate in Aceh still remains at high level every year.

KURZFASSUNG

Steigende Rohölpreise, einhergehend mit einer Politik der Subventionskürzungen im Energiesektor, sind für Entwicklungsländer wie Indonesien ein schwerwiegendes Problem. Subventionskürzungen seitens der Regierung sind jedoch nur ein Faktor, denn die Preissteigerungen haben Auswirkungen auf alle Wirtschaftsbereiche. Weiterhin haben sie auch auf die sozioökonomische Situation von Haushalten – sowohl in ländlichen als auch in städtischen Gebieten – Auswirkungen, vor allem auf die Realeinkommen der Haushalte. Die meisten theoretischen Ansätze heben die Tatsache hervor, dass steigende Rohölpreise zu steigenden Lebenshaltungskosten für Haushalte bestimmter sozialer Schichten führen, weil der Lebensstandard armer und von Armut bedrohter Haushalte, meist Angehörige der mittleren bzw. unteren Einkommensschichten, sinkt. Höhere Rohölpreise führen zu einer immer höheren Inflationsrate (Inflationsspirale), dies wiederum führt dazu, dass die Kaufkraft der Haushalte nachlässt. Ihr reales Einkommen wird sich in der Zukunft weiter verschlechtern, bis unter das Existenzminimum. Gerade Haushalte mit unsicherem Einkommen werden so in einen Armutskreislauf geraten (Teufelskreis der steigenden Rohölpreise). Dies bedeutet, dass Haushalte zunehmend von Armut bedroht sind und gerade diejenigen, die sich bereits in der Armutsfalle befinden, noch weiter verarmen werden (chronische Armut). Es gibt einen Zusammenhang zwischen Preissteigerungen, Subventionsabbau und Realeinkommen der Haushalte (sinkende Einkommen). Ziel dieser Arbeit ist es, den Einfluss der Preissteigerungen auf arme Bevölkerungsteile in der Provinz Naggroe Aceh Darussalam (NAD) zu untersuchen. Für die eingehende Untersuchung der Zusammenhänge wurden drei theoretische Ansätze angewandt, die die Auswirkungen der Preissteigerungen sowohl auf Mikro- als auch auf Makroebene erfassen. Der *Descriptive Analyse Approach* mit Primärdaten, die während der Feldforschung aufgenommen wurden, der *Social Accounting Matrix Approach* (SAM) und das *Computable General Equilibrium Modell* (CGE) für das zwei Perioden von SAM-Daten verwendet wurden (2002 und 2005). Die in dieser Arbeit verwendeten Rohölpreise beziehen sich auf drei Preiskategorien: Benzin, Diesel und Kerosin.

Die Arbeit kommt zu folgenden vier Ergebnissen: (1) Die wichtigsten sozioökonomischen Faktoren, die arme Bevölkerungsteile anfälliger für Auswirkungen der Preissteigerungen machen, sind Haushaltsgröße, Tätigkeit als Landwirt, geringe Bildung und Ausüben von Aushilfstätigkeiten; (2) Steigende Rohölpreise verursachen eine Verknappung der Vorräte, was die Preise weiter in die Höhe treibt; (3) Steigende Rohölpreise verstärken die ungleiche Einkommensverteilung zwischen städtischen und ländlichen Haushalten; und (4) Im Allgemeinen sind die Einkommen der Haushalte in städtischen Gebieten zunächst eher von extremen Preissteigerungen betroffen. Unter der hohen Inflationsrate leiden letztendlich aber die Haushalte in ländlichen Regionen, vor allem die ärmsten unter ihnen, die dadurch in eine chronische Armut geraten. Darüber hinaus sind mittelständische Haushalte in ländlichen Regionen eher von Armut bedroht, als Haushalte in städtischen Gebieten. Dies sind die Hauptgründe für die extreme Armut in der Region Aceh.

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Bonn, August 14th, 2009
Sofyan Syahnur

1. INTRODUCTION

1.1 Research Background

Fluctuations of the world prices for crude oil increased during the more recent decades. Since crude oil – and also gas, the price of which is linked to that of oil – are very important for the economies of industrialised and less developed countries. Hence these price changes require special attention. Figure 1.1 depicts the movement of the world price of oil adjusted for inflation for the years 1940 to 2008. As it can be seen from this figure, the world oil price[1] had a period of relative stability until the early 1970s and times afterwards when it changed rather drastically. During the 1970s -1980s, the real world oil price increased. With 103.76 US Dollar/barrel, it reached a peak at the beginning of the 1980s which remained unmatched until 2008. From 1985 until the early years of the 2000s it significantly decreased and became relatively stable if one excludes the Persian Gulf crisis and the war which occurred in 1990. The real world oil price increased again and reached 103.95 US Dollar/barrel on March 3rd, 2008[2]. Moreover on April 15th, 2008 oil price surged to a new high, reaching 114 US Dollar/barrel[3]. This upsurge was probably triggered by a number of factors including an increase in oil consumption in some of the more populated less developed countries and declining oil production of some of the world's largest oil producers. Figure 1.2 illustrates that the world production of crude oil reached the lowest point at the beginning and at the end of 1980s, but it increased extremely in the middle of the1980s. Since the 1990s world oil production has been increasing slowly with the exceptions of 2001 until 2004 in which it decreased. Consequently, some countries whose economies were impacted by these oil price increases considered introducing long term policy measures such as reducing government expenditure for subsidising domestic oil use.

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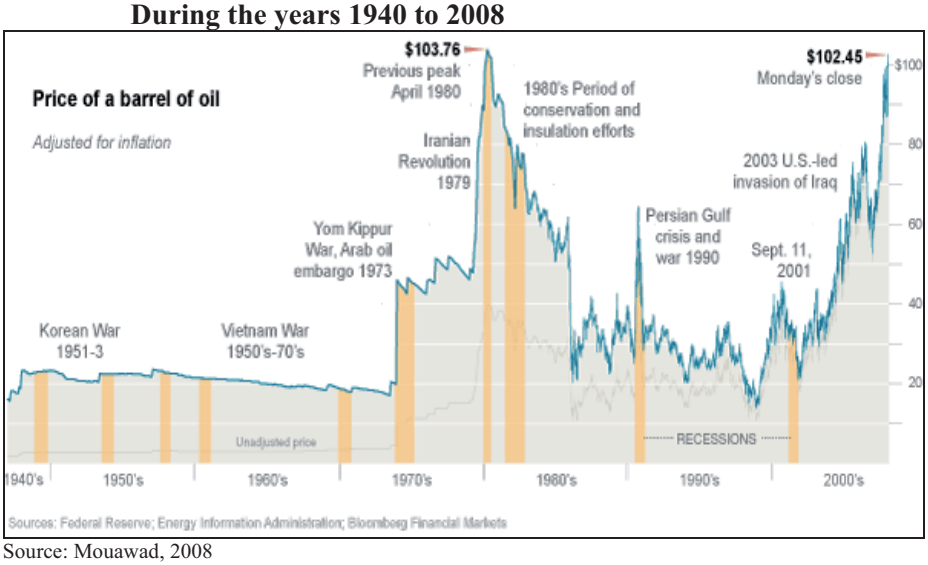
1) The price of energy is only one of many prices faced by households and firms– yet it attracts a disproportionate amount of attention in the media and from policymakers and economists. The reasons are (1) energy prices experience sharp and sustained increases at times (Hamilton, 2003); (2) these price increases matter more than in the case of other goods since the demand for energy is comparatively inelastic (Dahl and Sterner,1991), such as most workers have to drive to work every day and thus have little choice but to acquiesce to higher gasoline prices; (3) energy price fluctuations seem to be determined by forces that are exogenous to the countries' economy, such as political strife in the Middle East; and (4) major energy price increases in the past have often been followed by severe economic dislocations, suggesting a causal link from higher energy prices to recessions, higher unemployment, and possibly inflation (Kilian, 2008).

2) As illustrated by Mouawad (2008) concerning "Oil Tops Inflation – Adjusted Record Set in 1980" in Business, The New York Times, March.

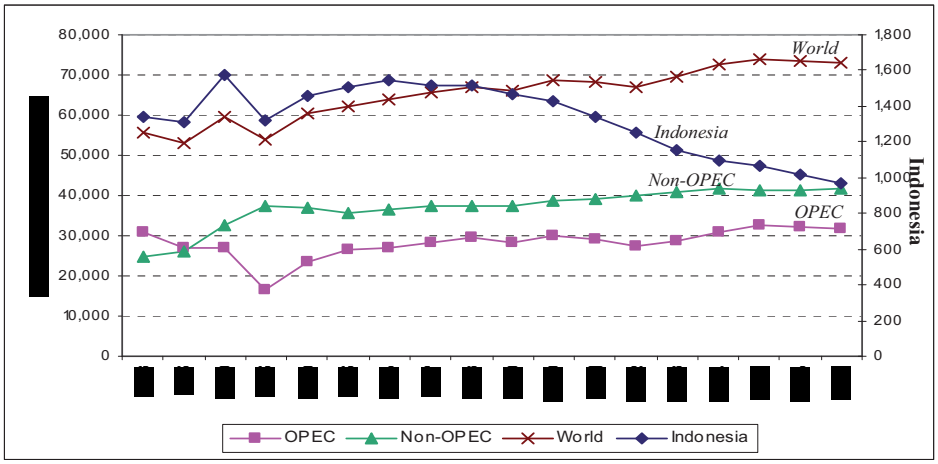
3) Mouawad (2008) enlightened relating to "Oil Prices hit a New High, and So Does a Gallon of Gas" in Business, The New York Times, April.

Figure 1.1 Fluctuations of World Oil Price Adjusted for Inflation During the years 1940 to 2008



Source: Mouawad, 2008

Figure 1.2 Annual Averages of World and Indonesian Crude Oil Production, 1973-2007 (Thousand barrels per day)



Note: Data are for crude oil and lease condensate excluding natural gas plant liquids.
Source: Own presentation based on Energy Information Administration Data (EIA), 1973-2007

As an exporter of crude oil as well as a net importer of oil, Indonesia has been confronted with significant consequences of these world oil price fluctuations which negatively affect the growth and stability of its economy[4]. These show up as depreciation of exchange rate between

4) A sustained oil price increase generated a permanent transfer of GDP from global oil importers to oil exporters, with additional transfers of income from oil consumers to oil producers within countries. Such a term of trade shock would affect the global economy through supply and demand effects as well as via second-round effects on inflation, for instance, through higher wage claims. This in turn would affect the extent to which central banks raise interest rates to offset inflationary pressures, and therefore the impact of the oil price increase on real activity. The impact on asset prices and financial markets would provide additional channels (IMF, 2000).

Rupiah and foreign currencies especially US dollar, high level of accumulated government debt, large government budget deficit, and deterioration of well-being. It is also indicated by a declining purchasing power of a certain society (the quality of living standard drops); the income of households living both in urban and rural areas goes down below the poverty line. When the world oil prices reached a peak in the 1980s, for the first time in Indonesia's history, government revenues from crude oil and petroleum products - as one of most important income sources - started to decline and later even deteriorated drastically impacting negatively on the then prevailing and future economic growth[5]. However, this decline in overall economic activities was also caused by shrinking crude oil production of Indonesia (see Figure 1.2). In 1982, crude oil production reached the peak and sharply fell until 1987. Then, it increased slowly again until 1996 and since than has been decreasing enduringly up to now. Thus, the year 1982 represented a remarkable turning point of the Indonesian economy for the first time. It was indicated by declining role of crude oil and petroleum products as the largest share of the government revenue. Unfortunately, the same pattern of causes was repeated after the economic crisis in 1997, but with relatively different effects. The fluctuations of world market oil prices shifted the role of Indonesia in and after 2004 from being a net exporter of crude oil to become a net oil importer of this raw material[6].

In line with these issues, fluctuation of the worldwide oil price has been urgently forcing the Indonesian government to formulate the fitting alternative policies through some regulations. In this regard, certain regulations, such as reducing oil subsidies can be useful instrument to help keep up government income and fiscal health as represented by the performance of the National Income and Expenditure Budget (APBN) in the recent years[7]. Consistent with the

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5) Two key features of the Indonesian economy made it potentially vulnerable to shocks originating abroad because of a significantly more dependent on foreign trade (the share of imports to GDP at current prices rose higher than exports, 26.3 % compared to 22.4%, respectively) and an extreme reliance on non-renewable exports such as crude oil, liquefied natural gas, timber products, metals and minerals which accounted for roughly three-fourths of the value of total exports as clarified by Thorbecke (1991 and 1992) and Downey and Thorbecke (1992), according to their publication on Adjustment and Equity in Indonesia.

6) Indonesia became a net petroleum importer on a monthly basis in July 2004 and the configuration of an energy switch in connection with the country's energy mix with respects to oil subsidy will be become a crucial agenda in the future as stated by Anshory and Resosudarmo (2007).

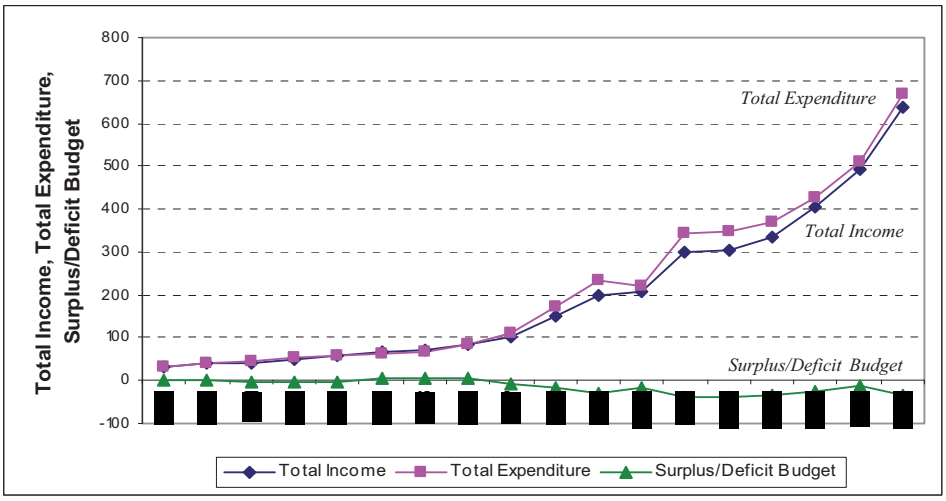
7) Based on the daily reports of Economic Research, Finance, and International Cooperation Bureau, Indonesian Department of Finance regarding economic indicators and National Income and Expenditure Budget (APBN) reports guided by Law No. 36/2005 concerning Financial Memorandum.

financial reports published by the Financial Department of Indonesia, government subsidy on oil prices had increased since the fiscal year 1997/1998. Before the economic crisis occurred and hit almost the entire economy of the ASEAN countries in 1997, Indonesian government spending on oil subsidies accomplished just around 1.42 trillion Rupiah (595.89 million US dollars) and non-oil subsidies consisting of fertilizer, basic food items, electricity, the credit interest of programs, and others were approximately 0.24 trillion Rupiah (100.71 million US dollars). Nevertheless, in 1998, the oil subsidies significantly augmented to be 28.61 trillion Rupiah (3,565.11 million US dollars) along with the increase in non-oil subsidies that were equal to 7.18 trillion Rupiah (894.70 million US dollars). The highest increase of government oil subsidies recorded 68.38 trillion Rupiah (6,575.00 million US dollars) occurred in the year 2001 during the last four years (1997-2000). Conversely, the non-oil subsidies degenerated until the amount of 9.06 trillion Rupiah (871.15 million US dollar). Nonetheless, in 2003, both oil and non-oil price subsidies decreased drastically reaching 30.04 and 13.86 trillion Rupiah (3,548.73 and 1,637.33 million US dollars), respectively.

Declining government oil subsidy did not last in the long-term time because government budget burden swelled over again in 2005, even more than the foregoing years, including the year 2001 when the budget burden was 68.38 trillion Rupiah (6,575.00 million US dollars). Hence, the year 2005 constitutes the zenith of the oil price subsidy during the last 10 years in which it reached the highest level in the amount of 121.08 trillion Rupiah. Actually, the oil price subsidies which amounted 95.06 trillion covered the implicit subsidy to the state public electricity company (PLN) by 21 trillion Rupiah as well as non-oil price subsidies of approximately 26.02 trillion Rupiah including 13 trillion for surviving the state public electricity company. As a result, the whole subsidy of oil prices and public electricity provided by the Indonesian government were more than 90 percent of the total subsidy[8]. Figures 1.3 and 1.4 provide the conditions of the Indonesian government income and expenditure in conjunction with the macroeconomic outlook of the Indonesian economy such as oil subsidy, non oil subsidy, debt, and exchange rate for the duration of the years 1989-2006.

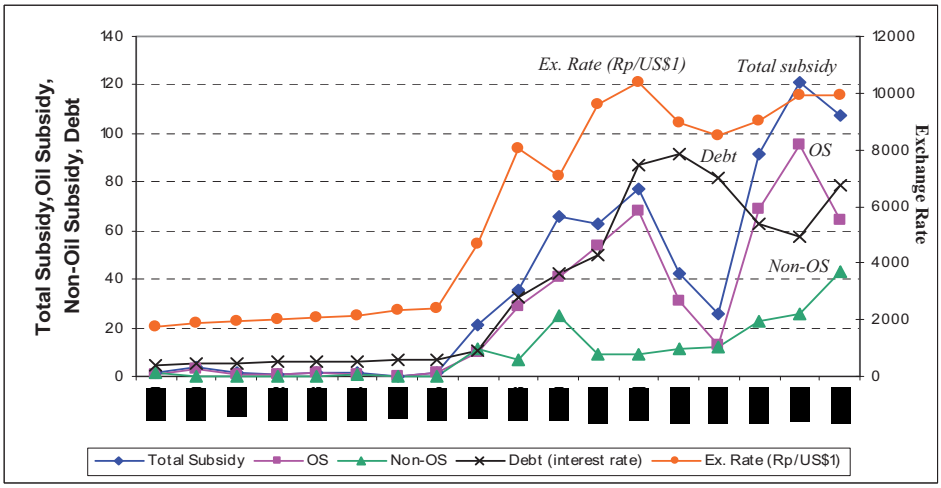
8) According to The World Bank's report with reference to public expenditure assessment of Indonesia towards maximizing a new opportunity (2007).

Figure 1.3 Realization of Government Income and Expenditure of Indonesia, 1989-2006 (in Trillion Rupiah)



Source: Own presentation based on Data from the Indonesian Financial Department, 1989-2006

Figure 1.4 Total Subsidy, Oil Subsidy, Non-Oil Subsidy, Debt, and Exchange Rate of Indonesia, 1989-2006 (in Trillion Rupiah)



Note: Non oil subsidy (Non-OS) consisted of fertilizer, basic food items, electricity, and credit interest of programs, and others.

Source: Own presentation based on Data from the Indonesian Financial Department, 1989-2006

In response to a sharp increase in government budget burden in 2005[9], the Indonesian government immediately increased the oil prices in March and October that was considered as a prominent policy as strengthened by issuing the Presidential Decree Number 55/2005. Consequently, the year 2005 constitutes a shocking period in which the government launched an increase in oil prices twofold within the same year which focused more on three types of

9) In fact, petroleum price subsidies have also resulted in economic distortions such as over consumption, largely benefit the consumption of upper income groups, and high smuggling out of country, Clements et al (2003).

oil prices: gasoline, diesel, and kerosene prices. In March 1st, 2005; gasoline price was raised from 1810 Rupiah to 2400[10] Rupiah (32.6%) as well as diesel price increased starting 1630 Rupiah to 2100 Rupiah (27.3%), but kerosene price was still subsidized by the government. In subsequent phase that is in October 1st, 2005 gasoline, diesel, and kerosene prices simultaneously increased again in significant percentage by 87.5 percent (from 2400 Rupiah to 4500 Rupiah), 104.8 percent (from 2100 Rupiah to 4300 Rupiah), and 185.7 percent (700 Rupiah to 2000 Rupiah), respectively (see Figure 1.5). In line with carrying out of the oil prices increase policy in 2005, the Indonesian government positively enabled to induce the saved money expansion to be 89.2 trillion Rupiah (8.99 billion US dollar) in the fiscal year 2005. Then, it was complemented with pressuring down on the government deficit budget to 24.9 trillion Rupiah (2.51 billion US dollar) or approximately 0.9 percent of the Gross Domestic Product (GDP)[11]. In a little while, May 24th, 2008 founded on the Indonesian Minister Regulation of Energy and Mineral Resources Number 16, 2008, these oil prices increased over again on average 28.75 percent consisting of gasoline (33.3% or 6000 Rupiah), diesel (27.9% or 5500 Rupiah), and kerosene (25% or 2500 Rupiah). It was resulted from the increase of world oil prices reaching 145 US Dollar/barrel.

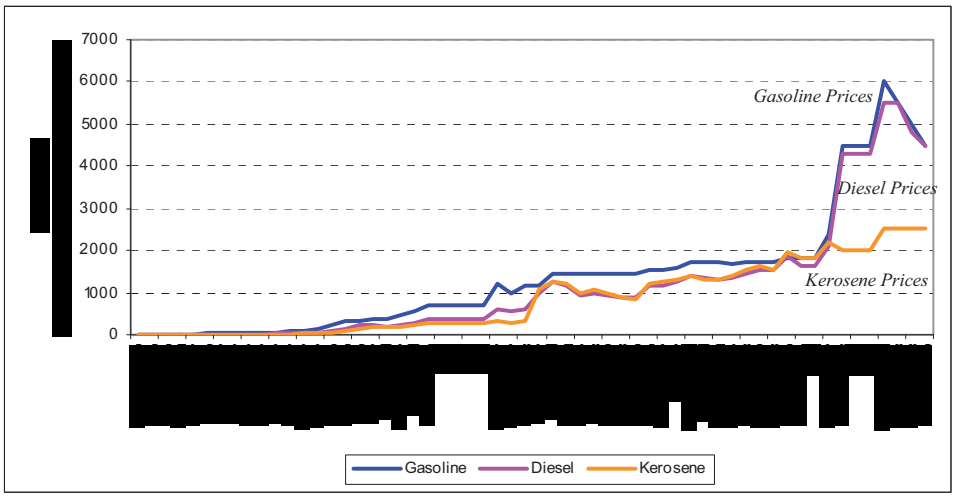
In fact, the Indonesian government has been embarking a gradually restructuring program on performing some policy adjustments, particularly in determining the domestic oil prices. It was aimed to advance the efficiency of government expenditure due to significantly rising world oil prices since the economic crisis in1997. Earlier than the year 1999, all oil prices in Indonesia were seriously subsidized. Nonetheless, since January 1999, the Indonesian government initiated to allow the variation of the oil prices free in favour of market mechanism. At that time, consequently, the price of Avtur and Avgas were around 1700 Rupiah and 1080 Rupiah, respectively. Afterwards, the following year, in 2001, the government implemented some well thought-out adjustments of oil prices; firstly, on April 1st, 2001, oil price was classified into three types: (a) oil consumed by public society was still subsidized; (b) oil for industries as input of the production activities was set up to be 50

10) According to Central Bank of Indonesia (BI) in relation to the exchange rate in 2005, US$1 is equal to 9,926 Rupiah.

11) The development of oil prices is reported by PERTAMINA in 2005 (state-owned oil company of Indonesia) based on the Presidential Decree (Perpres) Number 55/2005.

percent of the market price (mean of Platt Singapore of the previous month plus 5%), and would be recurrently increased; (c) oil for international business activities was 100 percent of market price. Secondly, on June 16th, 2001, the oil price for industries would be accustomed with the vacillation of a worldwide price. In 2002, there were two noteworthy occurrences of oil pricing policy; January 6th, 2002, gasoline price was equalized with the international prices by 100 percent, kerosene price for the public was augmented to be 600 Rupiah. Then, oil for industries was fiddled with 75 percent of the market price. In this opportunity, the government also threw up a declaration of ceiling price system as indicated by maximum and minimum retail price depending on the international crude oil prices. In March 1st, 2002, PERTAMINA (State-owned Oil Company of Indonesia) settled on monthly retail prices excluding kerosene in proportion to average market price after delegating by the Indonesian government. These modifications were continually carried out in April until December 2002. On January 1st, 2003, the government bumped up kerosene price from 600 Rupiah to be 700 Rupiah and the others increased every month since this month. Conversely, an increase in diesel price 21.9 percent invigorated by public complaint in that time and consequently reduced it again 6.5 percent, especially in February 2003[12] (see Figure 1.5 below).

Figure 1.5 The Oil Prices Policies of Indonesian Government on Gasoline, Diesel, and Kerosene (in Rupiah), 1965-2009



Note: Kerosene price subsidized by the government before October 1, 2005 reaching 700/litre Rupiah and June 16, 2001it was around 400/litre Rupiah.
Source: Own presentation based on PERTAMINA data (State-owned Oil Company of Indonesia, 1965-2009)

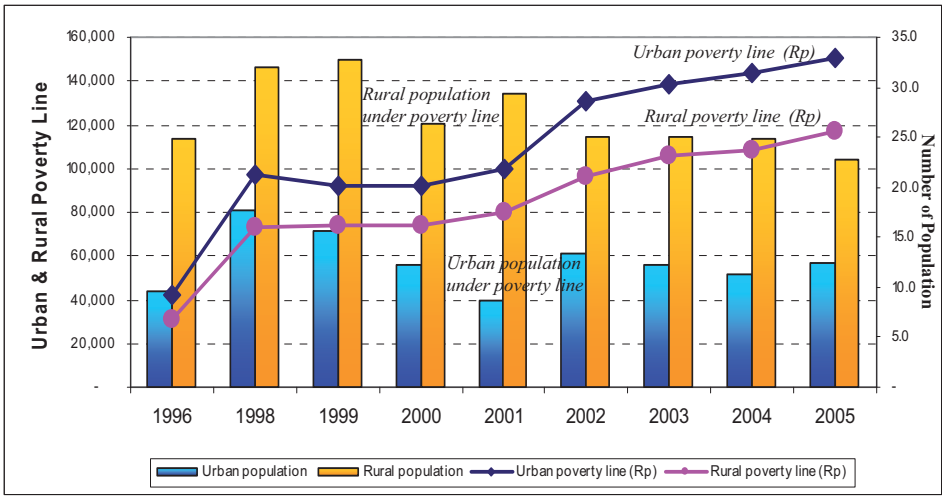
12) Timeline of Indonesian Oil Pricing Policy in Searching for Equitable Energy Price Reform for Indonesia was discussed by Anshory and Resosudarmo (2007) and PERTAMINA (2005).

Based on the previous description of the implementation of increasing oil prices strategy in Indonesia, there is an important point that must be noted. Beforehand, the main purpose of providing subsidies in a straight line on oil prices performed by the Indonesian government was aimed to accomplish cheaper oil prices domestically. As a result, the societies with a certain income level, especially the poor, were able to pay money for the oil products with lower prices and alongside to uphold national stability of lower inflation rate. Nonetheless, the burden of government expenditure highly increased after the economic crisis hit the Indonesian economy in 1997. Consequently, the government had been taking on transforming energy strategy by means of the subsidy reduction on oil. Its impact has fuelled the domestic oil prices drastically getting a higher level. In fact, the essential expectancy from carrying out the lessening in oil subsidy is not only to trim down the spending burden of the Indonesian government, but also to reallocate a significant proportion of oil subsidy reduction for improving the living standard of certain households. They are thoroughly affected by oil prices increase, particularly the poorest, poor, and middle-income households. In other words, there is a shifting purpose of the Indonesian government policies in connection with the subsidy reduction on oil. It changes from directly subsidizing on oil prices towards decreasing in oil subsidy. This is aimed at enlarging government financial assistances in picking up directly human well-being of society (human being-improved intention) through special programs i.e. the Compensation Program for Reduced Subsidies on Refined Fuel Oil or PKPS-BBM. The programs are exclusively financed by the Indonesian government through the National Income and Expenditure Budget (APBN) from reducing subsidy on oil.

By and large, the implementation of surging oil prices has been a principal policy choice for the Indonesian government in the recent years after the economic crisis in 1997. Unfortunately, the option of this policy do not purely endorse some significant consequences towards reducing a mounting pressure on government budget burden as indicated by the healthy financial performance of the government in the next periods, but also deteriorates the stability of macroeconomic performance and socio-economic welfare of certain society. Also, it worsens the equality of income distribution and increases the poverty rate together with the vulnerability of households to poverty which tends to increase. Moreover, Figure 1.6

illustrates that the poverty line in Indonesia significantly went up not only in urban regions but also in rural regions for the period of 1996-2005. Nevertheless, the urban poverty line was higher than rural poverty line measured by monthly income per capita of households in urban and rural regions in Indonesia during 1996-2005. In line with the rising poverty line both in urban and rural areas indicates that a number of poor people in Indonesia increased, especially in urban areas from 11.3 million in 2004 to be 12.4 million in 2005. In contrast, a number of poor people in rural regions considerably decreased from 24.8 million in 2004 to be 22.7 million in 2005. Despite the poor in rural areas tended to decline, a number of the poor were still twofold higher than those in urban areas. For the duration of years 1996-2005, a number of poor people in rural areas reached on average by 27.0 million and in urban areas around 12.6 million.

Figure 1.6 Poverty Line (Rupiah) and Number of Population below the Poverty Line (Million) in Indonesia, 1996-2005



Source: Own presentation based on Data from the Central Bureau of Statistics of Indonesia, 1996-2005

The reduction of oil subsidy is considered as a crucial quandary for the Indonesian government. On one hand, the valuable consequences of decreasing oil subsidy provide a favourable outcome in terms of curtailing government expenditure burden in the next periods as indicated by the healthier fiscal expenditure. On the other hand, at the same time, it generates higher production costs of certain economic sectors which directly utilize oil as the inherent inputs in production activities[13]. In addition, it also brings into being a set of impacts

13) Given wages, an increase in the price of oil increases the cost of production, forcing firms to increase prices, as stated by Blanchard (2003).

on welfare reduction and engenders a number of drawbacks towards certain households' socio-economic conditions both in rural and urban regions which experience directly or indirectly of its impact. It is highlighted by the purchasing power of the households which severely worsens owing to a rising higher inflation rate[14]. As a result, it stimulates depressing influences through an increase in the living costs of certain household groups in society, particularly the poor and vulnerable household groups. In other words, the consequent effects of declining oil subsidies are concurrently followed by a higher inflation rate through increasing input prices of particular economic production sectors. Chronologically, it will firstly generate higher tariffs on transportation services in addition to rising input prices and then induce upper prices of the industrial commodities due to production costs sharply increase. In conclusion, these conditions will simultaneously raise a higher inflation rate which is called cost-push inflation. Afterwards, it directly or indirectly affects on the households at the middle and lower income level. In this case, the households have to disburse at the advanced prices of the consumption goods and services from the economic sectors which are affected by the oil prices increases. The vicious circle of increasing oil prices as a consequence of declining subsidies on oil will austerely formulate higher prices of consumption goods and services at the end of impact which is called a spiral effect. Thereafter, the effects of increasing oil prices will be directly or indirectly experienced and struck down the real income of certain household at lower level (i.e. purchasing power drop) which is affected by going up a higher and higher inflation rate in general. This is well-known called spiral inflation[15].

Hence, the reductions of government oil subsidies which induce the escalating oil prices positively provide an important implication towards maintaining the efficiency of government

14) Inflation is the cruellest tax of all and hurts the poor relatively more than the rich, Easterly and Fischer (2000).

15) Cost-push inflation or supply-shock inflation is inflation induced by a rise in the costs of production of goods and services. Such cost increases arise abroad and be transmitted through higher prices of imported raw materials where no suitable alternative is available. It is argued that this inflation resulted from the rapid escalation in oil prices (the cost of petroleum imposed by the member states of OPEC). Since petroleum is so important to industrialized economies, a large increase in its price can lead to the increase of most products, raising the inflation rate. This can raise the normal or built-in inflation rate, reflecting adaptive expectations and the price/wage spiral, so that a supply shock can have persistent effects, Bannock, Baxter, and Davis (1999).

expenditure burden on one hand. On the contrary, it depressingly affects living standards of specific household groups and some particular economic sectors which directly or indirectly utilize oil as a substantial input within economic production activities for instance transportation sectors and industrial sectors[16]. In general, this situation not only generates a complicated problem on the whole economic dimension of production activities, but also deteriorates human living standards coupled with the instability of social conditions of the society. Therefore, in short, these phenomena bring about a crucial indication in terms of increasing poverty rate at national level as well as at regional level. The poor are openly susceptible to be trapped into poverty[17] or will be being the poorest who is well-known called a chronic poverty[18]. Implicitly, higher vulnerability to poverty of the households at the medium and lower income level results in increasing the poverty rate in the society. Therefore, the increase in oil prices is an important phenomenon of the economic shocks which significantly affect the real income or consumption level of poor household to fall down below the threshold level (i.e. the poverty line) through higher inflation rate. The vulnerability of household to poverty is highly correlated with this condition and even generates poverty trap-permanent alterations in income, (Alderman, 2002).

In view of phenomena discussed previously, this study makes an effort to investigate the impact of the oil prices increases on the poor at regional level[19] in particular Nanggroe Aceh Darussalam (NAD) province. The most important reason why Aceh will be particularly focused on this study is Aceh enriched with natural resources such as tropical forest, oil, gas, and other underground minerals and has been producing a large amount of oil and natural gas since 1975. Therefore, some giant industries such as Exxon Mobil Oil/Arun Liquefied Natural

16) Clements, et al (2003) clarified that the subsidy reduction directly increases petroleum prices and indirectly increases the prices of the commodities and services produced by the other sectors with the magnitude of indirect price rises in other sectors relying on the strength of production linkages with the petroleum sector.

17) Dercon, 2003 emphasized that poverty trap is which people may fall relatively easily but can not as easily emerge from caused by serious market failures combined with asset inequalities.

18) The chronic poverty as a state in which income is less than needs during a long and continuous period of time, Rodgers R. and Rodgers L (1993), Hulme and Shepherd, (2003).

19) Each province has own economic characteristics. The differences across provinces are caused by geographical location, economic growth (key economic sectors), public infrastructures, and telecommunication facilities, Kuznets, (1955), Williamson, (1965), Amos, (1988), Mathur, (1983), Lyons, (1991), Das and Alokesh, (1996), Martin, (1999), Demurger, (2001), Gil, et al, (2004), Barrios and Strobl, (2005), and Ezcurra, et al, (2005). Hence, an increase in oil prices generates a difference effect across provinces in Indonesia.

Gas (Arun LNG), ASEAN Aceh Fertilizer (AAF)/ Pupuk Iskandar Muda (PIM), and Aceh Paper Mill/Kertas Kraft Aceh (KKA)) have been playing an important role in determining most socio-economic aspects of Aceh. Along the lines of the large endowment of natural resources, the share of fiscal income and expenditure of the local government of Aceh both province and districts from its natural value also remarkably increased yearly[20]. In 1999, the portion of provincial government expenditure on the development expenditure was higher than the routine expenditure. The following year, in 2001, percentage of government expenditures between routine and development was relatively equal. In the course of the years 2002 until 2005, however, percentage of the development expenditure became a superior proportion over again proportionate to the routine expenditure. Table 1.1 portrays the performance of income and expenditure of the local government of Aceh during 1999-2005.

Table 1.1 Provincial and Districts' Government Income, Expenditure and Deconcentration of Aceh, 1999-2005 (in Billion Rupiah)

Description	1999		2001		2002		2003		2004		2005		% Average
Province	10^9 Rupiah	%	10^9 Rupiah	%	10^9 Rupiah	%	10^9 Rupiah	%	10^9 Rupiah	%	10^9 Rupiah	%	1999-2005
Income	596	24.6	961	14.8	2615	30.0	3103	30.7	3473	33.3	3376	37.2	28.4
Expenditure	583	24.9	849	14.2	2322	27.9	1594	20.2	1630	19.6	1358	18.0	20.8
Routine	*229*	*39.3*	*407*	*47.9*	*469*	*20.2*	*400*	*25.1*	*405*	*24.8*	*353*	*26.0*	*30.6*
Development	*354*	*60.7*	*442*	*52.1*	*1853*	*79.8*	*1194*	*74.9*	*1225*	*75.2*	*1005*	*74.0*	*69.4*
Districts		%		%		%		%		%		%	
Income	1829	75.4	5515	85.2	6098	70.0	7019	69.3	6960	66.7	5705	62.8	71.6
Expenditure	1756	75.1	5127	85.8	6015	72.1	6309	79.8	6671	80.4	6198	82.0	79.2
Routine	*985*	*56.1*	*2537*	*49.5*	*3000*	*49.9*	*3672*	*58.2*	*4027*	*60.4*	*3632*	*58.6*	*55.4*
Development	*771*	*43.9*	*2590*	*50.5*	*3016*	*50.1*	*2637*	*41.8*	*2644*	*39.6*	*2566*	*41.4*	*44.6*
Province + Districts		%		%		%		%		%		%	
Income	2425		6476		8713		10122		10433		9081		
PAD	*185*	*7.6*	*194*	*3.0*	*306*	*3.5*	*349*	*3.4*	*502*	*4.8*	*331*	*3.6*	*4.3*
Financial share (non tax)	*26*	*1.1*	*1453*	*22.4*	*3413*	*39.2*	*2618*	*25.9*	*4034*	*38.7*	*3681*	*40.5*	*28.0*
DAU			*4059*	*62.7*	*3842*	*44.1*	*3368*	*33.3*	*3891*	*37.3*	*3825*	*42.1*	*36.6*
Others	*2214*	*92.3*	*770*	*11.9*	*1152.0*	*13.2*	*3787*	*37.4*	*2006*	*19.2*	*1244*	*13.8*	*31.3*
Expenditure	2339	42.4	5976	75.7	8337	84.6	7903	78.8	8301	83.8	7556	80.1	
Routine	1214		2944		3469		4072		4432		3985		
Gov. Official exp.	*826*	*68.0*	-	-	*2349*	*67.7*	*2806*	*68.9*	*3098*	*69.9*	*2686*	*67.4*	*57.0*
Others	*388*	*32.0*	-	-	*1120*	*32.3*	*1266*	*31.1*	*1334*	*30.1*	*1299*	*32.6*	*26.4*
Development	1125		3032		4868		3832		3869		3571		
Government office	*139*	*12.4*	*404*	*13.3*	-	-	*1143*	*29.8*	*1465*	*37.9*	*1240*	*34.7*	*21.4*
Education & culture	*140*	*12.4*	*495*	*16.3*	-	-	*1061*	*27.7*	*880*	*22.7*	*748*	*21.0*	*16.7*
Infrastructure	*561*	*49.9*	*1211*	*39.9*	-	-	*1020*	*26.6*	*893*	*23.1*	*1001*	*28.0*	*27.9*
Transp., water, irrigation	*351*	*31.2*	*781*	*25.8*	-	-	*796*	*20.8*	*641*	*16.6*	*863*	*24.2*	*19.8*
Agriculture	*65*	*5.8*	*287*	*9.5*	-	-	*217*	*5.7*	*198*	*5.1*	*203*	*5.7*	*5.3*
Deconcentration Exp.	3178	57.6	1917	24.3	1522	15.4	2124	21.2	1602	16.2	1873	19.9	
Total Expenditure	5517		7893		9859		10027		9902		9430		

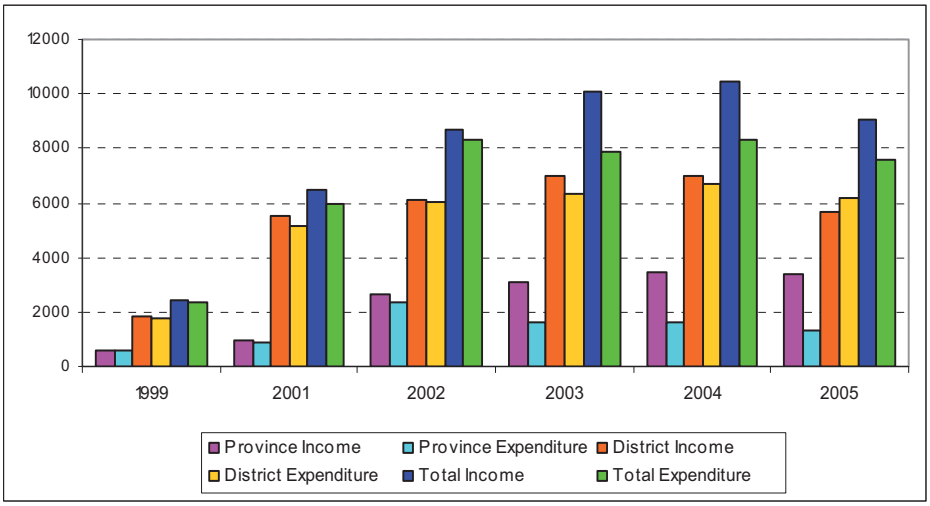
Note: - PAD (Own Revenue Sources) and DAU (General Allocation Fund)
- Before the Law 22/1999, INPRES (Presidential Instruction) and SDO (Subsidy for Autonomous Region) have played big roles in generating Aceh government revenue during that time.

Source: Own calculation based on The World Bank Data, 1999-2005

20) Aceh is one of wealthier regions in Indonesia as indicated by the capacity of fiscal revenues since 1999 which increase sharply. On the contrary it has the fourth largest number of the poor in Indonesia as emphasized by The World Bank's report in terms of Public Expenditure Assessment of Aceh: Expenditures for Reconstructing and Poverty Alleviation (2006).

Besides, the district government expenditures were spent more on the routine expenditure than the development expenditures. The general outlook of the local government income of Aceh shows that the higher contribution of government income comes from DAU (General Allocation Fund) on average 36.6 percent for the period of 1999-2005. In addition, the largest portion of the routine expenditure was spent mostly on government official salary on average 57 percent during 1999-2005. Moreover, the biggest part of the development expenditure of the local government income was expended for infrastructure and government office on average 27.9 and 21.4 percent during 1999-2005, respectively. This situation shows that there is a different performance of fiscal and expenditure of each district government in Aceh. It is highly emphasized by the maturity and orientation of the development planning of each region in the light of the implemented law of regional decentralization[21]. Figure 1.7 obviously shows the development of both province and each district governments' income and expenditure of Aceh for the period of 1999-2005.

Figure 1.7 Realizations of Provincial and District Government Income and Expenditure in Aceh, 1999-2005 at constant price 2006 (in Billion Rupiah)



Source: Own presentation based on The World Bank Data, 1999-2005[22]

21) Regional autonomy regulations were strengthened by the Law No. 22/1999 concerning on regional governments and the Law No. 18/2001 relating to the Special Autonomy for Nanggroe Aceh Darussalam Province. Furthermore, the Law No. 18/2001 is replaced by the Law No 11/2006 about the Aceh government.

22) The calculation based on merely regular fiscal revenues of local government as result of decentralization law excluding the reconstruction fund for the impact of tsunami on December 26th, 2004 around 16.4 trillion Rupiah (2005-2009) and a new administrative provincial law (UU No. 11/2006) that will be stated in 2008, The World Bank (2006).

Unfortunately, so far, Aceh still faces a higher poverty rate as indicated by the yearly poverty rate recorded by the Central Bureau of Statistics of Aceh (CBS, 2005). According to the CBS of Aceh, a number of the poor in Aceh reached 426 thousands (10.79%) of the total population 3.93 million in 1996. Then, in 2000, a number of the poor sharply increased from 1.10 million (26.5% of the entire Aceh population 4.16 million) to 1.22 million (30.43% of total population 4.02 million) in 2001. In 2003, a number of the poor were 1.25 million (40.39% of total population 4.21 million). Thereafter, in the period of 2004-2005, a number of the poor increased from 1.16 million to 1.90 million which are generated by increasing vulnerability of households to poverty. This situation was affected by the tsunami catastrophe at the end of December 2004 together with the oil prices increases in March and October 2005. An increase in the oil prices, as triggered by the cutback of the oil subsidies, induced higher prices of goods and services in general. This had considerable impacts on certain households in particular on poor and middle-income households. The impact of higher consumer prices on households is that their purchasing power expressed as real income decreases and, in general, also consumption level declines. The more pronounced such changes in consumer prices are the more negative is their impact on households. In other words, inflation – measured at the level of consumer prices – causes consumer welfare to be reduced if the income is not compensated by e.g. transfer payments or other means.

Derived from the research background of this study comprehensively discussed above, the effects of reducing oil subsidies which induce the increasing oil prices will negatively encroach on the welfare-dropping of certain households, particularly the poor through the real income decrease. Therefore, this study will basically lay emphasis more on investigating the impact of the oil prices increases (i.e. especially gasoline, diesel, and kerosene prices) on account of the oil subsidy reduction on the poor in Nanggroe Aceh Darussalam (NAD) Province.

1.2 Research Question, Study Objective and Hypothesis

1.2.1 *Central Research Question*

How large is the impact of the oil prices increases on poor households in Nanggroe Aceh Darussalam Province?

1.2.2 *Sub Research Question*

1. What are the main characteristics of the poor being vulnerable to the oil prices increases in Nanggroe Aceh Darussalam?

2. Whether a direct or indirect effect is the most severe in striking down the poor into the adverse circumstances if the policy of increasing oil prices is implemented?

3. Whether poor households in urban regions or in rural regions are most affected by the oil prices increases?

4. What courses of action can be implemented to reduce the poverty rate and the vulnerability of the poor to higher oil prices, both in the short run and in the long run?

1.2.3 *Research Objective*

1. To identify the main characteristics of the poor being vulnerable to the oil prices increases descriptively.

2. To investigate a direct and indirect effect of the oil prices increases on the poor both in urban areas and in rural areas.

3. To examine the real impact of the oil prices increases on the poor and the vulnerability of the poor to the oil prices increases whether in urban regions or in rural regions.

4. To derive a set of feasible strategies aimed at reducing the impact of higher oil prices on the poor and the vulnerability of the poor, both in the short run and in the long run.

1.2.4 *Hypothesis*

In line with theoretical reviews and correlated previous researches with respect to the impact of the oil prices increases on the poor, the study undertakes to formulate some hypotheses as follows:

1. There is a positive relationship between the effect of increasing oil prices as a result of diminishing government oil subsidies and increasing poverty rate together with the vulnerability of the households to poverty in Nanggroe Aceh Darussalam Province whether a direct or indirect impact.

2. The increase in oil prices as a consequence of reducing government oil subsidies give significant impact on poor households, both in urban and in rural regions together with the vulnerability of the households to poverty in Nanggroe Aceh Darussalam Province.

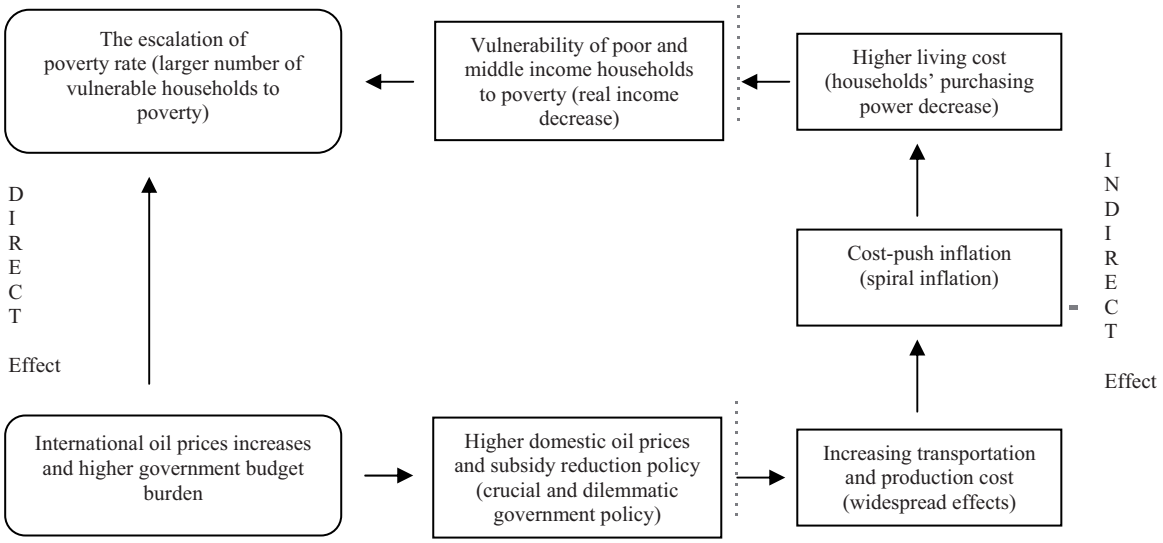
1.3 Structure of the Study

The specific discussions of this study are simply explained by presenting Figure 1.8. It is intended to capture the main relationship among elements from the analytical scheme and to illustrate the key mappings of the shocks of the oil prices increases on the poor. Also, it is followed by the investigation on the vulnerability of households to poverty as a consequence of the oil prices increases. In chapter 1, this study starts on an enlightenment of the relationship between the effects of rising oil prices and poverty along with the vulnerability of certain households related to poverty in Aceh. In the following chapter 2, this study embarks on describing a wide-ranging overview on the geographical and demographical settings accompanied by the socio-economic structure of Aceh. Moreover, the debates of the previous studies and theoretical concept concerning the correlation of the oil prices increases, inflation rate, and poverty as well as the description of the oil subsidy reduction impact on the whole economy through general equilibrium concept, particularly on the poor are explained in the subsequent chapter 3. The modelling concepts are employed by the study consisting of the Descriptive Analysis Approach (DAA), the SAM-based model alongside accounting multiplier decomposition analysis, and the CGE-based model in addition to the compilations of the involved data set are clarified in chapter 4. Afterwards, in chapter 5 will discuss and analyze the results of three approaches utilized by the study comprehensively.

Specifically, at the first stage of chapter 5, in section 5.1, this empirical study embarks on exploring the picture of pragmatic conditions of each household group by using a descriptive analysis approach. It is supported by primary data conducted through field study. Some particular information explored at the beginning of this observation is focused more on the characteristics of households relating to socio-economic conditions in addition to the behaviour of the oil prices increases in the society. Based on this information, the study undertakes to enlighten the basic stumbling block with respect to poverty analysis together with the investigation of the vulnerability of households to poverty through a simple framework analysis such as graphs and tabulations. At the second stage, in section 5.2, the study attempts to take a look at the impact of the oil prices increases on the poor along with the vulnerable households to poverty comprehensively by means of the SAM-based model.

The expected intention will be primarily cracked down on nominal and real income distribution across institutions[23] in Aceh, both direct and indirect accounting multipliers effect as a consequence of harmful effects of rising oil prices in 2005. Moreover, these analyses are also strengthened by global accounting multipliers effect which provides direct and indirect accounting multipliers effect in chorus. The SAM-based model utilized at the second phase of this study makes use of two periods of SAM data set in 2002 and 2005 and then the results will enable to be compared each other in line with obtaining the fundamental pattern of the income distribution issues extensively.

Figure 1.8 Schematic Relationships of the Major Elements of the Impact of the Oil Prices Increases on the Poor



Source: Own presentation

Lastly, in section 5.3, this study takes a crack at investigating the impact of the oil prices increases on the poor in addition to the vulnerability of households to poverty. To capture this purpose, the first step, it compares between the values of the CGE results at the initial level of

23) The term "institutional" in the Systems of National Account (SNA) or The Social Accounting Matrix (SAM) is to stress formal and organizational features of transactors and, to a lesser extent, transactions. Thus an institutional definition of transactors emphasizes the units that make decisions and an institutional definition of transactions is the formal appearance of theses transactions. As a consequence institutional definitions and classifications remain close to the actual experience of the economic agents (Bochove and Tuinen, 2005) and (Pyatt, 1991). Therefore, institutions employed in this study are represented by households, firms and the government (see section 4.2.2 relating to Simplified Schematic Social Accounting Matrix (SAM) Table).

the years 2002 and 2005 in order to illustrate the preliminary conditions of the whole economy of Aceh of these years. Afterwards, the second step, the primary values of the CGE results of the year 2005 are compared by the outcomes of the CGE simulations derived from SAM 2005 base. This is examined to portray the real impact of the oil prices increases on the poor. Last but not least, the third step, the study compares between the preliminary values of the CGE results of the year 2002 and the values of the CGE simulations derived from SAM 2005 base. This is aimed to illustrate the conditions of the vulnerability of households to poverty in Aceh. Specifically, the substantial investigations which will be highly expected from this third approach are able to illustrate undoubtedly the impact of the oil prices increases on the poorest, poor and middle-income households in addition to the vulnerable households to poverty. This is highlighted by presenting the variation of household income and expenditure; the saving performance of each household group; the factor income of household; the economy-wide wage (rent) for formal and informal labour[24] as well as capital; the local government issues with regard to the local government income and expenditure; and finally the performance of economic sectors in Aceh.

[24] Informal labour is a concept used extensively to describe insecure forms of economic activity. Such activity may include self-employment or own-account work, employment in fragile micro-businesses or family-run activity, as well as employment where the employer fails to provide appropriate access to social protection or formal registration of any contractual relationship (Galli and Kucera, 2004 and Henley et al, 2009).

2. PROVINCIAL BACKGROUND

2.1 Geographical Outlook of Aceh

The Republic of Indonesia is one of nations in Southeast Asia, which is well known as the world's largest archipelagic country extending 5,120 kilometres from the east to the west and 1,760 kilometres from the north to the south. It is inhabited with a number of population 218,868,791 people in 2005 and the annual rate of population growth during the years 2000-2005 amounting to 1.30 percent (CBS, 2005). The total territorial area of Indonesia is 9.8 million square kilometres and brings Indonesia as generally recognized territorial country which covers land and sea. The largest part of territorial area is sea approximately 7.9 million square kilometres (81%) and then 1.9 million square kilometres (19%) constitutes land area. The country divides up land borders with Papua New Guinea, East Timor and Malaysia. Other neighbouring countries take account of Singapore, the Philippines, Australia, and the Indian territory of the Andaman and Nicobar Islands.

Furthermore, Indonesia consists of 17,508 islands including small and bigger islands and only 6,000 of which are occupied and sprinkled over both sides of the equator. From a large number of islands, Indonesia has five main islands and two large groupings of smaller islands such as Maluku and Nusa Tenggara. Then, the five largest islands are Sumatera has area 425,606 square kilometres and is settled by 21.0 percent of total population, Sulawesi is lived in by 7.2 of total population which spread over 174,219 square kilometres of Indonesia's total land area, and Java has area 129,187 square kilometres of Indonesia's total land area and is populated by 58.8 percent of total population. Furthermore, two of the islands are carved up with other nations i.e. (i) Kalimantan (the Indonesian part of Borneo) which is the largest island as compared to the others shared with Malaysia and Brunei which has 539,460 square kilometres of Indonesia's total land area and is dwelled in by 5.5 percent of total population, and (ii) Irian Jaya shared with Papua New Guinea in addition to two major archipelagos such as Nusa Tenggara and the Maluku Islands. It has 421,981 square kilometres of Indonesia's total land area and is inhabited by only 7.5 percent of Indonesia’s total population. Moreover, Indonesia convincingly has a tropical climate with two dissimilar seasons such as wet and dry season cause of lying along the equator.

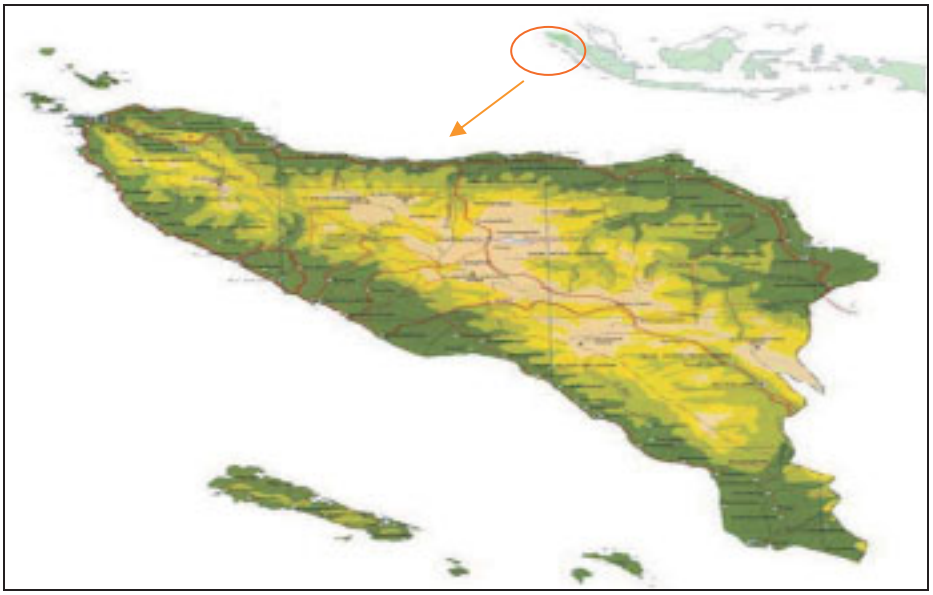
Indonesia encompasses 33 provinces administratively (CBS, 2005). Each province has its own political legislature and governor. The provinces are subdivided into two regencies: district (*kabupaten)* and city (*kota)*, which are further subdivided into sub-districts (*kecamatan*), and then into village groupings either *desa* or *kelurahan*. Following the implementation of regional autonomy regulation in 2001 (the Law No. 22/1999), the regencies and cities have become the key administrative units that are responsible for providing most government services to society. The village administration level which is supervised by an elected *lurah* or *kepala desa* (village chief) is really influential role on a citizen's daily life, and handles matters of a village or neighbourhood.

Aceh is one of the five provinces of which has greater legislative privileges and an advanced degree of autonomy from the central government including Jakarta (the capital city of Indonesia), Yogyakarta, Papua, and West Papua provinces. For instance, the government of Aceh has the right to formulate an independent legal system i.e. a form of Syariat Islam (Islamic law) as strengthened by the Law No. 11/ 2006 in connection with Aceh provincial government administration. In fact, the Law No. 11/2006 also involves to the other fundamental issues on the subject of economic aspects in which the largest proportion of gas and petroleum share of a main industry (Arun LNG) approximately 70 percent is organized by Aceh government itself as a strategic regional income source. Besides, the existence of the local politics party in Aceh is lawfully permitted by the central government based on the Law No. 11/2006.

Aceh Province which capital city is Banda Aceh (legitimately Nanggroe Aceh Darussalam) located geographically on the northern tip of the island of Sumatera as special territory of Indonesia. Aceh is the most western provinces of Indonesia with the Indian Ocean to the west, the Malacca strait region to the east, and Sumatera Utara province to the south and with the Malacca strait and Andaman Sea to the north. It covers an area of 57,365.57 square kilometres or covered 12.26 percent of Sumatera Island consisting of the protected forest area 26,440.81 square kilometres, the cultivated forest area 30,924.76 square kilometres and Leuser Mountain Ecosystem 17.900 square kilometres that has the highest peak 3,466 meter above

sea surface. Aceh encompasses 119 islands, 35 mountains, 73 big rivers and some of them running into the straits of Malacca such as Krueng Aceh in the Greater Aceh regency, Krueng Peusangan, Krueng Peureulak, Krueng Tamiang and running to the Indian Ocean such as Krueng Teunom, Krueng Meureubo, Krueng Simpang Kanan and Simpang Kiri. Finally, there are 3 lakes such as Laut Tawar in Central Aceh, Aneuk Laot in Pulau Weh and Laut Bangko in South Aceh[25]. Governmentally, Aceh has 21 regencies (Aceh Barat, Aceh Barat Daya, Aceh Besar, Aceh Jaya, Aceh Selatan, Aceh Singkil, Aceh Tamiang, Aceh Tengah, Aceh Tenggara, Aceh Timur, Aceh Utara, Banda Aceh, Bener Meriah, Bireuen, Gayo Lues, Langsa, Lhokseumawe, Nagan Raya, Pidie, Sabang, and Simeulue), 228 districts (Kecamatan), 642 places of residence (Mukim), 111 Subdistricts (Kelurahan), and 5947 villages (Desa), (Aceh Regional Development Planning Board, 2006).

Figure 2.1 Topographical Map of Nanggroe Aceh Darussalam Province, Indonesia



Source: The Aceh Regional Development Planning Board (BAPPEDA of Aceh), 2006

During the years 1998-2005, the population growth in Aceh was moderately very small increase. In 1999, the population of Aceh was equal to 4,083,300 as indicated by the population increase around 0.002 percent. Subsequently, in 2000, the growth of population reached relatively significant number by 0.018 percent. The highest growth of population in

25) This is comprehensively illustrated by the Central Bureau of Statistics of Aceh (2006) and the Aceh Regional Development Planning Board (2006).

Aceh was experienced in 2000 by adding up to 0.036 percent. Nevertheless, the growth of population was negative occurred in 2001, 2004 and 2005 reaching 0.032, 0.033, and 0.009 percent, respectively. These phenomena were made happen by appalling conflict between the Free Aceh Movement and the Indonesian National Army (central government) for along time in the past until on August 15th, 2005 accompanied by signing a Memorandum of Understanding (MoU) in Helsinki. Moreover, at the end of the year 2004 exactly December 26th, 2004 Aceh was destroyed by the biggest earthquake together with a horrible tsunami wave that killed a number of Aceh people. It also devastated much of the western coast of the regions of Aceh, including most part of the capital of Nanggroe Aceh Darussalam Province as so-called Banda Aceh. Consequently, these conditions provided a considerable negative impact on declining the population growth in Aceh for the duration of 8 years. This was indicated by averaging the population growth for these periods by -0.0096 percent per annum.

2.2 Socio-economic View of Aceh

Viewing the economic structure of Aceh throughout period of 2000-2005, the economy of Aceh was tightly supported by a significant contribution of oil and natural gas production. It was indicated by the average per annum for six years in the amount of 43.56 percent from the whole gross production of Aceh based on current prices. Specifically, the percentage of oil and natural gas sector contributed to the Gross Regional Domestic product (GRDP) of Aceh in 2000 by the highest contribution for a period of six years equal to 50.32 percent. But, during the years 2001-2005, the share of this sector had been decreasing gradually. At the end of the year 2005 its contribution to the GRDP only amounted to 38.87 percent (sees Table 2.1). It portrays that the role of oil and natural gas sector, essentially crude oil and natural gas mining sector together with oil and natural gas manufacturing industries, have a large influence in determining the conjuncture of economic activities counting the development process of Aceh. In general, this was pointed out through its dominant contribution yearly to the GRDP. Therefore, the stability of its involvement in reality of development process encourages substantial effect on the sustainable economic development of Aceh. On the contrary, the participation of the other sectors excluding oil and natural gas in stimulating the economic development process of Aceh has been also increasing progressively from year to year. In the year 2000, all these sectors contributed about 50 percent to the GRDP and

increased by 61.14 percent in year 2005. Among these economic sectors, agriculture sector provided the greatest share to the GRDP of Aceh which on average over the last six years around 21.48 percent was measured in current prices. According to yearly detailed information of its involvement specifies that agricultural sector has provided a moderately large contribution in the amount of 17.68 percent in 2000. In the following year, in 2004, its share significantly increased in the amount of 24.76 percent in spite of the fact that its contribution slightly declined by 22.83 percent in 2005.

Moreover, the agricultural contribution to the GRDP of Aceh founded on non oil and gas sector at current prices was exceedingly higher than the other non oil and natural gas sectors by 37.98 percent per year. Actually, increasing its contribution of agricultural sector was caused by decreasing share of the oil and gas mining and refinery sector in contributing to the GRDP of Aceh as indicated by yearly reduction, especially after the years 2001-2005. This situation implies that the agricultural sector still plays an important role in determining on the entire economy of Aceh. Hence, the participation of the agricultural sector in the economy must be considered as a fundamental sector by Aceh government as its contribution per year to the GRDP of Aceh considerably increases. The structural description of economic performance of Aceh based on the current prices is illustrated exclusively in Table 2.1 both the GRDP with oil and gas as well as without oil and gas sectors.

The further examination will be dissimilar, if the economic structure of Aceh is relied on the GRDP including oil and gas as well as non oil and gas sectors anchored in the constant price in 2000. Since the year 2000, the economic growth of NAD province was enormously depended on the swelling share of oil and gas mining sector based on the GRDP with oil and gas at constant price in 2000. In 2000, the contribution of oil and natural gas sector to the GRDP of NAD Province reached 50.32 percent. In contrast, agricultural sector simply contributed by 17.68 percent to the GRDP in that time. So, in the interval of six years (2000-2005), oil and natural gas sector had considerably provided a large share to the GRDP of NAD Province on average 45.24 percent. At that time, the agricultural sector's share was just about 18.93 percent during this period (see Table 2.2). However, the pragmatic development

of the economy of Aceh for the period of 2000-2005 based on constant price in 2000 without involving the role of oil and natural gas sector illustrates that the contribution of agricultural sector was above 35 percent every year as compared to the other economic sectors. They are mining and quarrying sectors; manufacturing sectors; electricity and water supply sectors; construction sectors; trade, hotel, and restaurant sectors; transportation and communication sectors; financing, real estate, business services sectors; and services sectors (CBS, 2006).

Table 2.1 Economic Structure of Nanggroe Aceh Darussalam Province Including and Excluding Oil-Gas, 2000-2005 at Current Prices (in percentage)

Economic Sectors Including Oil and Gas	2000	2001	2002	2003	2004	2005
1. Agriculture, Livestock, Forestry & Fishery	*17.68*	*21.80*	*20.86*	*20.95*	*24.76*	*22.83*
2. Mining & Quarrying	*30.95*	*22.20*	*29.08*	*30.03*	*24.28*	*22.56*
a. Crude Oil & Natural Gas	*30.53*	*21.70*	*28.58*	*29.54*	*23.72*	*21.87*
b. Quarrying	*0.42*	*0.50*	*0 .50*	*0.49*	*0 .56*	*0.69*
3. Manufacturing Industries	*24.70*	*25.68*	*20.82*	*19.93*	*19.46*	*20.04*
a. Oil & Gas Manufacturing	*19.79*	*21.92*	*15.39*	*14.90*	*16.41*	*17.00*
b. Non oil & Gas Manufacturing	*4.92*	*3.76*	*5.44*	*5.03*	*3.05*	*3.04*
4. Electricity & Water Supply	*0.11*	*0.14*	*0.16*	*0.21*	*0.24*	*0.22*
5. Construction	*4.43*	*3.88*	*4.01*	*3.85*	*4.16*	*2.59*
6.Trade, Hotel & Restaurant	*10.86*	*13.20*	*11.89*	*11.08*	*11.22*	*12.22*
7. Transportation & Communication	*3.21*	*3.77*	*3.82*	*3.83*	*4.30*	*6.57*
8. Financing, Real estate,& Business Services	*0.59*	*0.71*	*0.88*	*1.01*	*1.15*	*2.04*
9. Services	*7.48*	*8.61*	*8.47*	*9.12*	*10.43*	*10.92*
Gross Regional Domestic Product (Oil and Gas)	100.00	100.00	100.00	100.00	100.00	100.00
Percentage GRDP non-Oil & Gas (at current prices)	49.69	56.38	56.03	55.56	59.87	61.14
Percentage GRDP Oil & Gas (at current prices)	50.32	43.62	43.97	44.44	40.13	38.87
Economic Sectors Excluding Oil and Gas	2000	2001	2002	2003	2004	2005
1. Agriculture, Livestock, Forestry & Fishery	*35.58*	*38.67*	*37.24*	*37.71*	*41.35*	*37.34*
2. Mining & Quarrying	*0.85*	*0.89*	*0.88*	*0.87*	*0.94*	*1.13*
a. Crude Oil & Natural Gas	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
b. Quarrying	*0.85*	*0.89*	*0.88*	*0.87*	*0.94*	*1.13*
3. Manufacturing Industries	*9.90*	*6.67*	*9.70*	*9.05*	*5.09*	*4.98*
a. Oil & Gas Manufacturing	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
b. Non oil & Gas Manufacturing	*9.90*	*6.67*	*9.70*	*9.05*	*5.09*	*4.98*
4. Electricity & Water Supply	*0.22*	*0.24*	*0.28*	*0.37*	*0.40*	*0.37*
5. Construction	*8.91*	*6.89*	*7.16*	*6.93*	*6.95*	*4.24*
6.Trade, Hotel & Restaurant	*21.85*	*23.41*	*21.21*	*19.94*	*18.74*	*19.99*
7. Transportation & Communication	*6.46*	*6.69*	*6.82*	*6.89*	*7.18*	*10.75*
8. Financing, Real estate,& Business Services	*1.18*	*1.26*	*1.57*	*1.81*	*1.92*	*3.34*
9. Services	*15.05*	*15.27*	*15.12*	*16.41*	*17.42*	*17.87*
Gross Regional Domestic Product (Non-Oil and Gas)	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculation based on the Central Bureau of Statistics Data of Aceh, 2000-2005

Table 2.2 Economic Structure of Nanggroe Aceh Darussalam Province Including and Excluding Oil-Gas, 2000-2005 at Constant Price 2000 (in percentage)

Economic Sectors Including Oil and Gas	2000	2001	2002	2003	2004	2005
1. Agriculture, Livestock, Forestry & Fishery	*17.68*	*20.46*	*17.40*	*17.03*	*19.99*	*21.04*
2. Mining & Quarrying	*30.95*	*24.99*	*34.72*	*36.14*	*30.38*	*23.32*
a. Crude Oil & Natural Gas	*30.53*	*24.52*	*34.31*	*35.74*	*29.90*	*22.78*
b. Quarrying	*0.42*	*0.47*	*0.41*	*0.40*	*0.47*	*0.55*
3. Manufacturing Industries	*24.70*	*23.83*	*20.93*	*20.19*	*18.35*	*16.85*
a. Oil & Gas Manufacturing	*19.79*	*20.07*	*15.86*	*15.29*	*14.96*	*12.76*
b. Non oil & Gas Manufacturing	*4.92*	*3.76*	*5.07*	*4.88*	*3.38*	*4.08*
4. Electricity & Water Supply	*0.11*	*0.13*	*0.10*	*0.11*	*0.15*	*0.17*
5. Construction	*4.43*	*3.72*	*3.51*	*3.36*	*3.75*	*3.30*
6.Trade, Hotel & Restaurant	*10.86*	*13.54*	*11.52*	*11.19*	*12.05*	*15.06*
7. Transportation & Communication	*3.21*	*3.83*	*3.33*	*3.27*	*3.76*	*6.31*
8. Financing, Real estate,& Business Services	*0.59*	*0.71*	*0.74*	*0.91*	*1.21*	*1.49*
9. Services	*7.48*	*8.78*	*7.75*	*7.81*	*10.38*	*11.91*
Gross Regional Domestic Product (Oil and Gas)	100.00	100.00	100.00	100.00	100.00	100.00
Percentage GRDP non-Oil & Gas (at constant price)	49.68	55.41	49.83	48.97	55.14	64.46
Percentage GRDP Oil & Gas (at constant price)	50.32	44.59	50.17	51.03	44.86	35.54
Economic Sectors Excluding Oil and Gas	2000	2001	2002	2003	2004	2005
1. Agriculture, Livestock, Forestry & Fishery	*35.58*	*36.92*	*34.93*	*34.78*	*36.25*	*32.64*
2. Mining & Quarrying	*0.85*	*0.85*	*0.82*	*0.82*	*0.66*	*0.86*
a. Crude Oil & Natural Gas	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
b. Quarrying	*0.85*	*0.85*	*0.82*	*0.82*	*0.66*	*0.86*
3. Manufacturing Industries	*9.90*	*6.79*	*10.17*	*9.96*	*6.14*	*6.34*
a. Oil & Gas Manufacturing	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
b. Non oil & Gas Manufacturing	*9.90*	*6.79*	*10.17*	*9.96*	*6.14*	*6.34*
4. Electricity & Water Supply	*0.22*	*0.23*	*0.20*	*0.23*	*0.27*	*0.26*
5. Construction	*8.91*	*6.72*	*7.05*	*6.86*	*6.80*	*5.11*
6.Trade, Hotel & Restaurant	*21.85*	*24.43*	*23.12*	*22.85*	*21.85*	*24.23*
7. Transportation & Communication	*6.46*	*6.92*	*6.68*	*6.69*	*6.81*	*9.78*
8. Financing, Real estate,& Business Services	*1.18*	*1.29*	*1.48*	*1.87*	*2.19*	*2.30*
9. Services	*15.05*	*15.85*	*15.55*	*15.95*	*18.83*	*18.48*
Gross Regional Domestic Product (Non-Oil and Gas)	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculation based on the Central Bureau of Statistics Data of Aceh, 2000-2005

In point of fact, historically, since 1969 agricultural sector has been being as a fundamental economic sector in NAD Province even though its contribution moderately decreased per annum derived from the GRDP at constant price devoid of the role of oil and natural gas sector[26]. During 1969-1974 the contribution of agricultural sector was approximately 60

26) The transformation of structural economy of Aceh was investigated specifically by Syahnur (2003) through using a traditional Shift-Share analysis.

percent annually. But year by year its share tends to dwindle regularly because of increasing oil and natural gas sector's share such as crude oil-natural gas mining and quarrying sector and oil-natural gas manufacturing sectors at that time. It was started during the years 1975-1993 reaching 40 percent. For the period of 1994-1997 its contribution reached around 37-40 percent. In history, it was precisely instigated by discovering natural gas at Arun Area (Lhokseumawe) in 1971 which has been manufactured for the first time in 1975. And the following year 1977 produced the condensate form as preliminary production. Consequently, it has been creating a central attention of the economic activities and aroused the emergences of some new basic industries in Aceh for instance Exxon Mobil Oil/Arun Liquefied Natural Gas (Arun LNG); ASEAN Aceh Fertilizer (AAF)/ Pupuk Iskandar Muda (PIM); and Aceh Paper Mill/Kertas Kraft Aceh (KKA); using highly technology and capital intensive-oriented economic activities (Hasan, 1992).

Despite the agricultural contribution has the tendency decline year on year, but it still takes part as a primary sector in providing for the economic development process in Aceh. This was strengthened by a significant absorption of labour as accumulated by this sector in the year 2002 more than half of the total number of labour by 57.35 percent. It was widely spread out in rural regions with a higher number of labours around 92.23 percent than in urban regions approximately 6.75 percent. Moreover, the largest number of labour in agricultural sector worked at the informal economic activities about 88.30 percent and formal activities solely around 11.70 percent. In 2005, the labour absorption in agricultural sector tended to increase considerably in the amount of 57.73 percent which widely disseminated in rural regions about 93.25 percent and in urban regions just around 6.75 percent. In this period the proportion number of labour who worked at the informal activities was approximately 88.58 percent and formal activities added up to 11.42 percent. There were other economic sectors which absorbed quite larger number of labour such as trade, hotel, and restaurant sector by 18.06 percent. The largest number of labour worked in rural areas around 63.99 percent and urban areas about 36.02 percent. But, the proportion of labours worked at the formal and informal activities with relative similar number by 45.73 percent and 54.27 percent, respectively. Another sector was services sector with labour absorption reaching 11.85 percent. The largest

number of labour worked at formal activities by 77.07 percent and informal activities only 22.94 percent. They were mostly at rural areas around 52.13 percent and at urban areas just around 47.87 percent. Tables 2.3 and 2.4 specifically represent the labour structure of Aceh by economic sectors for the period of 2002 and 2005.

Table 2.3 The Proportion of Labour Structure by Economic Sectors in Nanggroe Aceh Darussalam Province in 2002

Economic Sectors	Sectors (%)	Labour by regions (%)		Sectors (%)	Labour by types (%)	
		Village	City		Formal	Informal
1. Agriculture, Livestock, Forestry & Fishery	*57.35*	*92.23*	*7.77*	*57.35*	*11.70*	*88.30*
2. Mining & Quarrying	*1.22*	*50.25*	*49.75*	*1.22*	*95.76*	*4.24*
3. Manufacturing Industries	*4.32*	*69.55*	*30.45*	*4.32*	*59.10*	*40.90*
4. Electricity & Water Supply	*0.10*	*25.80*	*74.20*	*0.10*	*57.06*	*42.94*
5. Construction	*2.69*	*50.24*	*49.76*	*2.69*	*62.46*	*37.54*
6.Trade, Hotel & Restaurant	*18.06*	*63.98*	*36.02*	*18.06*	*45.73*	*54.27*
7. Transportation & Communication	*3.78*	*70.99*	*29.01*	*3.78*	*48.08*	*51.92*
8. Financing, Real estate,& Business Services	*0.64*	*9.54*	*90.46*	*0.64*	*72.53*	*27.47*
9. Services	*11.85*	*52.13*	*47.87*	*11.85*	*77.07*	*22.93*
Total	100.00	78.36	21.64	100.00	31.83	68.17

Source: Own calculation based on the Central Bureau of Statistics Data of Indonesia, 2002

Table 2.4 The Proportion of Labour Structure by Economic Sectors in Nanggroe Aceh Darussalam Province in 2005

Economic Sectors	Sectors (%)	Labour by regions (%)		Sectors (%)	Labour by types (%)	
		Village	City		Formal	Informal
1. Agriculture, Livestock, Forestry & Fishery	*57.73*	*93.25*	*6.75*	*57.73*	*11.42*	*88.58*
2. Mining & Quarrying	*0.78*	*59.87*	*40.13*	*0.78*	*95.76*	*4.24*
3. Manufacturing Industries	*1.55*	*77.23*	*22.77*	*1.55*	*61.73*	*38.27*
4. Electricity & Water Supply	*0.08*	*18.32*	*81.68*	*0.08*	*57.06*	*42.94*
5. Construction	*2.99*	*62.41*	*37.59*	*2.99*	*62.46*	*37.54*
6.Trade, Hotel & Restaurant	*17.90*	*51.28*	*48.72*	*17.90*	*45.73*	*54.27*
7. Transportation & Communication	*4.44*	*46.94*	*53.06*	*4.44*	*48.08*	*51.92*
8. Financing, Real estate,& Business Services	*0.60*	*84.40*	*15.60*	*0.60*	*72.53*	*27.47*
9. Services	*13.93*	*47.87*	*52.13*	*13.93*	*75.73*	*24.27*
Total	100.00	75.81	24.19	100.00	31.52	68.48

Source: Own calculation based on the Central Bureau of Statistics Data of Indonesia, 2005

To make out how much formal and informal labour's contribution precisely within enhancing the economic development of Nanggroe Aceh Darussalam Province for the duration of the years 2002-2005 can be investigated by the identification of how much the aggregate labour's share and capital' share in association with the total factors productivity by using the Cobb-

Douglas production function. It is commonly represented by equation $Y = A L^{\alpha} K^{1-\alpha}$, where Y is the Gross Regional Domestic Product (GRDP)[27], A is a constant, L and K are labour and capital respectively, α is a parameter that measures the relative importance of labour and capital in producing a unit of output. If the production function contains a complete description of all of the relevant inputs to the production process then this process should be reproducible at any scale. In other words, if all of the inputs to the production function are increased by a fixed multiple, then output should increase by this same multiple. This property is called constant returns to scale. Hence, it really important to know the labour and capital elasticity of production functions because they determine the relationship between the growth rate of output and the growth rate of factors inputs in Aceh[28]. In general, the Cobb-Douglas production function is widely used and it can successfully account for a number of features of the data. Its major properties are Y is non-decreasing in inputs or $\frac{\delta Y}{\delta L} \geq 0; \frac{\delta Y}{\delta K} \geq 0$, marginal productivities are non-increasing in inputs or $\frac{\delta^2 Y}{\delta L^2} \leq 0; \frac{\delta^2 Y}{\delta K^2} \leq 0$, and the production function is symmetric or $\frac{\delta^2 Y}{\delta L \delta K} = \frac{\delta^2 Y}{\delta K \delta L}$. Nevertheless, this production function has a definite elasticity of substitution between inputs that is always 1.

Detailed information of these major issues is represented by Table 2.5 with reference to the relationship between the growth rate of output and the growth rate of factor inputs (aggregate labour and capital) employing the Cobb-Douglas production function. Relying on Table 2.5, the labour' share of total income in Aceh was 0.29 units (29%) and the capital's share of total income was 0.71 units (71%) in 2002, while the total factors productivity in 2002 reached by 05.16 units. This expression explains that amount of 29 percent and 71 percent increase in output will be gained by one percentage of increase in labour and capital inputs, respectively.

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27) GDP is related to aggregate capital and labour through a production function as explained by Farmer (1997).

28) The labour elasticity, e_L, of the production function is the proportional change in Y for a given proportional change in L, that is $e_L = \frac{\Delta Y/Y}{\Delta L/L}$, which can also be written as $MPL \frac{L}{Y}$. If $MPL \frac{L}{Y} = \alpha = \frac{wL}{PY}$ is equal labour's share of total income (for the Cobb-Douglas function, labour's share of total income is a constant equal to α, where *w* is price of aggregate labour and *p* is price of aggregate output as discussed by Farmer (1997).

In addition, the total factors productivity of inputs in 2005 experienced an increase in productivity of inputs approximately 105.35 units as compared to the total productivity of factor inputs in 2002. Nevertheless, labour's share endured a relative reduction in the amount of 0.27 units (27%) and the capital's share put up with an increase around 0.73 units (73%). This situation clarifies that there is a moderately structural composition change of factor inputs' share between labour and capital for the period of 2002-2005.

Table 2.5 Labour's Share, Capital's Share, and Total Factor Productivity in Nanggroe Aceh Darussalam Province by Economic Sectors in 2002 and 2005

Economic Sectors	Parameters in 2002			Parameters in 2005		
	αL	αK	TFP	αL	αK	TFP
1. Agriculture, Livestock, Forestry & Fishery	*0.29*	*0.71*	*115.02*	*0.41*	*0.59*	*57.34*
2. Mining & Quarrying	*0.20*	*0.80*	*224.47*	*0.16*	*0.84*	*216.31*
3. Manufacturing Industries	*0.36*	*0.64*	*184.96*	*0.24*	*0.76*	*204.54*
4. Electricity & Water Supply	*0.22*	*0.78*	*338.13*	*0.21*	*0.79*	*138.77*
5. Construction	*0.35*	*0.65*	*63.12*	*0.39*	*0.61*	*81.54*
6.Trade, Hotel & Restaurant	*0.26*	*0.74*	*52.62*	*0.19*	*0.81*	*110.57*
7. Transportation & Communication	*0.25*	*0.75*	*154.68*	*0.28*	*0.72*	*115.00*
8. Financing, Real estate,& Business Services	*0.25*	*0.75*	*160.49*	*0.14*	*0.86*	*154.72*
9. Services	*0.86*	*0.14*	*9.06*	*0.31*	*0.69*	*91.12*
Aggregate L, K, and TFP	0.29	0.71	105.16	0.27	0.73	105.35
Economic Sectors by using Formal Labour	αL-F	αK	TFP-F	αL-F	αK	TFP-F
1. Agriculture, Livestock, Forestry & Fishery	*0.06*	*0.94*	*120.59*	*0.08*	*0.92*	*102.69*
2. Mining & Quarrying	*0.19*	*0.81*	*191.42*	*0.16*	*0.84*	*215.58*
3. Manufacturing Industries	*0.29*	*0.71*	*150.39*	*0.20*	*0.80*	*204.03*
4. Electricity & Water Supply	*0.16*	*0.84*	*206.29*	*0.15*	*0.85*	*145.51*
5. Construction	*0.26*	*0.74*	*72.20*	*0.30*	*0.70*	*96.53*
6.Trade, Hotel & Restaurant	*0.16*	*0.84*	*45.39*	*0.11*	*0.89*	*129.93*
7. Transportation & Communication	*0.15*	*0.85*	*80.56*	*0.17*	*0.83*	*129.56*
8. Financing, Real estate,& Business Services	*0.20*	*0.80*	*63.11*	*0.11*	*0.89*	*157.46*
9. Services	*0.83*	*0.17*	*9.09*	*0.26*	*0.74*	*100.37*
Aggregate L, K, and TFP	0.19	0.81	98.34	0.16	0.84	132.51
Economic Sectors by using Informal Labour	αL-InF	αK	TFP-InF	αL-InF	αK	TFP-InF
1. Agriculture, Livestock, Forestry & Fishery	*0.26*	*0.74*	*84.16*	*0.37*	*0.63*	*61.89*
2. Mining & Quarrying	*0.01*	*0.99*	*121.84*	*0.00*	*1.00*	*141.19*
3. Manufacturing Industries	*0.13*	*0.87*	*119.54*	*0.07*	*0.93*	*152.33*
4. Electricity & Water Supply	*0.09*	*0.91*	*205.74*	*0.09*	*0.91*	*140.59*
5. Construction	*0.16*	*0.84*	*77.61*	*0.17*	*0.83*	*106.09*
6.Trade, Hotel & Restaurant	*0.15*	*0.85*	*44.30*	*0.10*	*0.90*	*127.81*
7. Transportation & Communication	*0.13*	*0.87*	*78.39*	*0.16*	*0.84*	*127.72*
8. Financing, Real estate,& Business Services	*0.08*	*0.92*	*60.73*	*0.04*	*0.96*	*151.75*
9. Services	*0.55*	*0.45*	*12.69*	*0.08*	*0.92*	*118.94*
Aggregate L, K, and TFP	0.15	0.85	84.80	0.15	0.85	116.95

Note: αL (labour share = wL/GDP_f), αK (capital share = rK/GDP_f), TFP (total factor productivity = $GDP_m/L^{\alpha}K^{1-\alpha}$) where GDP_f and GDP_m are Gross Domestic Product at factor cost and at market prices respectively, αL-F & InF (Formal & Informal labour share), TFP-F & InF (total factor productivity based on Formal & Informal Labour).

Source: Own calculation by using calibration of the Cobb Douglas Production Function based on SAM Data and the Central Bureau of Statistics Data of Indonesia, 2002 & 2005.

Table 2.5 also provides some critical points on the subject of formal and informal labour's share of total income as well as the total factor productivity of factor inputs consistent with economic sectors in 2002 and 2005. For instance, the formal labour's share in the agricultural sector reasonably grew from 6 percent to 8 percent. However, the informal labour's share increased a quite high in the order of 26 percent to 37 percent in 2005. It means that one unit percentage of change on the increase in formal labour input has some impact on enlarging approximately 6 until 8 percent in output. And, an increase in output about 26 percent until 37 percent was caused by informal labour throughout the years 2002-2005. Implicitly, the informal labour's share exceedingly contributed on increasing output as compared to the formal labour in agricultural sector. In contrast, the total factor productivity of formal labour and capital moderately declined during this period from 120.59 to be 102.69 units. Also, the total productivity of informal labour and capital was approximately 84.16 units in 2002 and 61.89 units in 2005. Generally, the formal and informal labour's share in the course of the years 2002 and 2005 quietly had the same values of elasticity around 15 percent, but the total productivity of factor inputs such as formal labour and capital had a greater value than the total productivity of informal labour and capital during this period of time. In 2002, the total productivity of formal labour and capital was 98.34 units and augmented by 132.51 units. Then, the total productivity of informal labour and capital were 84.80 units in 2002 and 116.95 units in 2005. Deriving from a structural depiction of economic analysis, the proportion of labour absorption together with the formal-informal labour and capital elasticity of production function which was dispersed by the economic sectors in Aceh provided an important note. That is, agricultural sector still takes part in an important role on the whole economy of Aceh as compared to the other economic sectors. It indicates that the economic dependency rate of society in Aceh towards the agricultural activities is extremely high which is strengthened by the highest absorption of labour. In spite of the fact that its economic contribution of this sector to the GRDP of Aceh was relatively lower than oil and natural gas sector because of inferior total factor productivity of labour in agricultural sector.

In actual fact, for some periods of development phases, the economic performance of Aceh has been facing a huge obstacle in maintaining the strongly sustainable economic development process. The reason is the failures of the local government policies to promote

the inter-linkages of the economic sectors each other in particular between the role of the agricultural sector and the oil and natural gas sector, especially crude petroleum and natural gas mining sector as well as oil and natural gas manufacturing industries. Consequently, the disparity rate in these sectors' role strappingly, in turn, creates a big gap among these economic sectors. It was as indicated by highly depending on the contribution of crude oil and natural gas sector as indispensable sources of economic development of Aceh for the length of period of years. Ignoring the role of agricultural sector on one hand and merely promoting the growth of oil and natural gas sector has been stimulating a significant unconstructive impact on the economic development consequences in Aceh on the other hand. This is strengthened by higher inequality of income distribution[29] between the poor and the rich and in turn persevere consistently a higher number of poor households for along time[30]. In line with the linkage issues of the economic sectors in Aceh, there are two critical points of economic configuration regarding the sustainable economic development process in Aceh. Firstly, Aceh unsurprisingly has a prospective economic sector which is called key sector[31] in which has inter-linkages among economics sectors in keeping with the highest values of backward linkage effect ($BL_j = \sum_{i=1}^{n} X_{ij} / X_j$, where X_{ij} is total unit of commodity $_i$ used in producing X_j unit of commodity $_j$); forward linkage effect ($FL_i = \sum_{j=1}^{n} X_{ij} / Z_i$, where Z_i is total inter-industry demand for i ($\Sigma_j X_{ij}$) and final demand for i (Z_i); and total linkage effect constitutes the compilation of direct and indirect linkages from final demand increase obtained from the Leontief inverse matrix ($TL_j = \sum_i a_{ij}$ *, where a_{ij}* = $(1\text{-}a_{ij})^{-1}$ is Leontief

29) Inequality illustrates the degree to which the distribution of economic welfare generated in an economy differs from that of equal shares among its inhabitants. In practice, the measure most commonly adopted is that of the distribution of income but other measures also employed include expenditure and wealth. Accordingly, the income distribution is a frequency distribution showing numbers of persons, taxpayers or households classified by levels of annual income as stated by Bannock, Baxter, and Davis (1999).

30) Poor households have typically larger families, relatively more children, less education, work longer hours, change jobs more frequently, agriculture as a main source of income, and non-agricultural activities (rural areas) according to Downey and Thorbecke, 1992.

31) Sadoulet and Janvry (1995) highlighted clearly that choice of the strategic sectors in which to invest is based on their capacity to generate forward linkages (which may encourage investment in sectors that require their production as input) or backward linkages (which may encourage investment in sectors producing the inputs that they demand).

inverse matrix and $a_{ij} = X_{ij} / TP_j$, where TP_j is total production of commodity $_j$) such as agro-industry (food and beverage industry). This condition provides a stronger reason that agricultural sector still dominates in encouraging the whole economic activities in Aceh as indicated by its considerable contribution to the GRDP of Aceh[32].

Moreover, they are some prospective economic sectors if the analysis will be emphasized on the framework of backward, forward, and total linkages indices for instance trading sector; petroleum refinery sector; construction sector; food and beverage industry; wood product and other industry; communication sector, electricity sector, the milling rice, flour, and various sort of seed industry; and cooking oil industry. It seems that all of those considerably have a big power over promoting the powerfully economic development of Aceh. Secondly, in accelerating economic development process in Aceh must be done through generating net capital formation, improving efficiency of production activities and gaining over the quantity and quality exports of the agricultural-industrial products in particular agro-industry. In these issues, the local government has to pay more attention with respect to the development framework policies on supporting the inter-linkages of economic sectors in favour of societal fundamental needs. Afterwards, the local government has to initiate consistently with the improvements of these potential economic sectors through increasing the quality of human resources and public infrastructures generally (i.e. public goods and services). Besides, the consequences of the feeble spot on the direction of implementing the sustainable development policies in Aceh relating to inter-linkages of potential economic sectors have been putting forward reducing a dissimilarity of opportunity in the economic activities. Additionally, in turn, these conditions are considered to create some dualisms on the whole aspects of societal living between rich and poor households or between the well-off and the deprived regions. There were some essential upshots of income distribution in Aceh based on ahead of study conducted before the implementation of autonomy regulation. If the local government injected the subsidies (i.e. rising government expenditure) in one of economic sectors, it would merely generate a large enough income increase of certain institutions in particular firms through the highest accounting multipliers. The other institutions, especially

[32] According to the empirical study on the subject of the analysis of the linkages among economic sectors in Nanggroe Aceh Darusslam Province using an Input-Output model, Syahnur (2004).

households, would receive the huge advantages from the escalation of the government subsidy effect which were experienced by non-agricultural urban households and agricultural households. Nevertheless, the constructive impact was not as much as the firms' achievement. Additionally, non-agricultural rural households received the smallest improvement from the injection of the local government subsidies than the others, particularly the firms.

In keeping with the results of accounting multiplier decomposition analysis, the structural path analysis represented some specific conclusions that if the local government carried out the subsidies injection focused on one of economic sectors, the most of transmission path would have took shape a direct path by way of increasing income of households without affecting an increase in output of definite economic sectors. This represents that the impact courses of actions of the subsidies injection were not accompanied by higher accounting multipliers effect on the whole economic activities[33]. These phenomena unambiguously figured out the performances of economic development of Aceh at the previous period in which most economic development policies implemented by the government solely took sides some people in society, not for all societies. As a result, this situation significantly provided a high disparity in income distribution across institutions in Aceh. Therefore, so far, it was still as one of the crucial issues in which the society will be significantly forced to the vulnerability to poverty[34] and even suppressed them to topple into the poverty trap[35], if some

33) This is illustrated by Syahnur (2001) in his investigation on the inequality of income distribution of households in Aceh in particular comparing non agricultural households with agricultural ones by means of a SAM-based model. The investigation was deepened by an accounting multiplier decomposition analysis and a structural path assessment. This study was conducted before Aceh was granted special autonomy starting in 2001.

34) The term vulnerability has been widely utilized in the context of the academic literature to assess the risk of damage caused by uncertain events. Guimaraes (2007) argued that risk as uncertain consequences, particularly exposure to unfavourable consequences. It is discussed comprehensively by Guimaraes with regard to a review of the literature on vulnerability related to poverty.

35) Bannock, Baxter, and Davis (1999) defined that poverty is the situation facing people whose material needs are less satisfied. Poverty can be defined by absolute measure which indicates the earnings below some specified minimum level i.e. poverty line (absolute poverty) or in relative terms which represents the number of the poorest 10 per cent of households, for example (relative poverty). Afterward, poverty trap illustrates the combination of losing state-benefit entitlement and paying tax that can ensure that poor families keep very little of any extra money they earn or which people may fall relatively easily but can not as easily emerge from caused by serious market failures combined with asset inequalities (Dercon, 2003).

shocks impinged on their lives as indicated by real income reduction underneath the threshold level such as an increase in the oil prices through wage-price spiral effect (spiral inflation).

In the context of the vulnerability to poverty, Dercon (2001) basically underlined that poverty is acknowledged to be multidimensional[36]. There is no reason to limit a concept and measurement of vulnerability to income, consumption or other money-metric dimensions only, even when using quantitative means. Vulnerability related to dimensions such as educational opportunities, mortality, nutrition and health could be measured as well. It means that vulnerability closely correlates with the risk of damage caused by uncertain events in which the events possibly occurring, beyond the direct control of individuals and households. According to Dercon, types of risk can be categorized into three groups i.e. (i) risks affecting individual or household (idiosyncratic risk); (ii) risks affecting groups of households or communities (covariant risks (a wider range of people risk)) such as unemployment, resettlement, harvest failure; and (iii) risks affecting regions or nations i.e. type of economic risk consisting of changes in food prices; growth collapse; hyperinflation; Balance of payments, financial or currency crisis; technology shocks; terms of trade shock; and transition costs of economic costs. As a final point, Dercon also highlighted that well-being and poverty are the ex-post outcome of complicated decision process of individuals and households over assets and incomes, faced with risk. Vulnerability to poverty is the ex-ante situation, i.e. before one has knowledge of the actual shocks that will occur. Vulnerability is determined by the options available to households and individuals to make a living, the risks they face and their ability to handle this risk. Consistent with the perspectives of the vulnerability to poverty, this study starts by looking into the impact of oil price increases on the poor and followed by capturing the issues of the vulnerability of households to poverty as a last investigation. These issues are analyzed by utilizing three approaches separately consisting of the Descriptive Analysis Approach (DAA), the SAM-based model together with accounting multiplier decomposition analysis as well as direct, indirect, and global accounting multiplier analyses. Afterwards, the CGE-based model will be extensively discussed in the next section, particularly in chapter 4.

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36) Kakwani and Silber, 2008 highlighted that " ….general theories of human flourishing are not final, because life always turns up new cases, and we must preserve the flexibility to respond to them."

3. PREVIOUS STUDIES AND THEORETICAL REVIEW

3.1 Oil Prices Increase, Inflation, and Poverty

In general, inflation[37] is defined as an increase in a certain set of prices, e.g. for goods and services. It can be seen as a devaluing of the worth of money (Bannock, Baxter, and Davis, 1999). Inflation is usually measured by using three main price indexes consisting of the gross domestic product deflator (GDP deflator), the producer price index (PPI) and the consumer price index (CPI). The GDP deflator is the ratio of nominal GDP in a given year to real GDP[38] of that year. It highlights that the calculation involves all the goods and services produced in the economy. Therefore, it is a widely based price index that is frequently used to measure inflation as change in prices that has occurred between the base year and the current year. In addition, the PPI is designed to measure prices at an early stage of the distribution system in which it is a measure of the cost of a given basket of goods including raw materials and semi finished goods. So, it covers the prices at the first level of essential commercial transaction that can be as one of the business cycle indicators such as the index of "sensitive materials". These are closely watched by policymakers.

Last but not least, the CPI measures the cost of buying a fixed basket of goods and services representative of the purchases of consumers, usually in urban areas, at the retail level and the cost of a given basket of goods which is the same from year to year taking into account not only goods being produced domestically for consumption but also imported ones, Dornbusch, et al (2004). In this regard, the CPI can be computed by using two methods in general. First, unweighted price indexes only compare prices between two periods such as unweighted

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37) There is a distinction between inflation and inflation rate. Inflation is increase in a certain set of prices and inflation rate is the level of increase in a certain set of prices between two periods, expressed usually in percentage of the price level of the base period. In this study, the term inflation rate will be frequently used as a main indicator to provide the robust analysis of this study (see subsection 5.1.3 in chapter 5).

38) GDP is the value of goods and services produced in a particular period by all resident producers minus the value of intermediate consumption. GDP less consumption of fixed capital (depreciation) is net domestic product. There are also two additional ways to arrive at GDP; one is using factor income (i.e. compensation of employees, gross operating surplus and gross mixed income) and net taxes on production and imports, the other one is using the sum of all final expenditures by residents (final consumption expenditure and gross fixed capital formation), changes in inventories and exports less imports of goods and services. Furthermore, GDP measured using current prices is called nominal GDP and GDP measured using base year prices is called real GDP as discussed by Farmer (1997).

aggregate price index ($\frac{\sum Pn}{\sum Po} x100$, where *Pn* is the current price and *Po* is the base price) or unweighted relative average price index ($\frac{\sum[(Pn/Po)x100]}{i}$, where *i* is the number of goods). Unfortunately, the unweighted price indexes do not consider the role of the produced goods which also determine price changes. Second, weighted price indexes illustrates a weighted average of prices for a given bundle of goods and services in a certain region and interval of time such as Laspeyres [$CPI_L = \frac{\sum Pn.Qo}{\sum Po.Qo} x100$], Paasche [$CPI_P = \frac{\sum Pn.Qn}{\sum Po.Qn} x100$], and Fisher [$CPI_F = \sqrt{\left(\frac{\sum Pn.Qo}{Po.Qo}\right)\left(\frac{\sum Pn.Qn}{Po.Qn}\right)}$] where *Pn* is the current price, *Qn* is the current quantity, *Po* is the base price, and *Qo* is the base quantity. The Fisher index is a special weighted average of Laspeyres and Paasche. From the appearances of formulas, Paasche and Laspeyres indexes differ from each other considering weighted quantity in determining the index measurement. Laspeyres indexes utilize the weighted quantity in the base period and Paasche indexes employ the weighted quantity in the current period. However, Paasche indexes are able to show up to date price indexes because the weighted quantity in the current period is applied in calculating its price index. Furthermore, if the data of prices and weighted quantity in the base period and in the current period are sufficient provided in one region, Fisher indexes (Fisher's Ideal Index) will demonstrate a better configuration of the living cost of society because it holds time reversal test[39] ($I_o^n . I_n^o = 1$, where *I* is price indexes, n is current prices, and o is the base price) and factor reversal test ($PxQ = \frac{\sum Pn.Qn}{\sum PoQo}$, where *P* is price index and Q is quantity index).

39) Time reversal test is a test that may be used under the axiomatic approach which requires that is the prices and quantities in the two periods being compared are interchanged the resulting price index is the reciprocal of the original price index. Then, factor reversal test requires that multiplying a price index and a volume index of the same type should be equal to the proportionate change in the current values (OECD, 2005).

In this study, it uses the CPI data provided by the CBS of Aceh from the years 1997- 2006 calculated by using Laspeyres method. The existence of the CPI will be frequently referred to as an important determinant in analyzing real income of households for both the qualitative and quantitative analyses. The reason is that the CPI is still as a vital indicator used to point out the cost of living or cost of living index of society in Indonesia. Therefore, the main purpose of the CPI is to determine the price change of consumer goods and services purchased by households. The percentage of change either increase or decrease in the level of prices as indicated by the CPI represents inflation or deflation rate by means of the formula: Inflation/Deflation is equal to $\left[\left(\frac{CPI_t}{CPI_o}\right)-1)x100\right]$ or $\left[\left(\frac{CPI_t - CPI_o}{CPI_o}\right)x100\right]$, where CPI_t is the *CPI* in period t, CPI_o is the base period (usually year or month) of the CPI (usually equal to 100), discussed lengthily in subsection 5.1.3 in chapter 5.

Discussing the impact of inflation is greatly enhanced if first the causes of inflation are hypothesised and then substantiated by empirical test. Because identifying the crucial sources of inflation makes it more straightforward to connect it with other important components in the economy. Actually, two main causes of inflation are usually identified; demand-pull inflation and cost-push inflation. Some of the sources of demand-pull inflation are found to be an increase in the nominal money stock in the economy, an increasing government spending which exceeds its revenue and, hence, leads to printing of more money or borrowing, the reduction of indirect and direct taxes, and a depreciation of the exchange rate. Those expansionary policies shift the aggregate demand curve to the right and directly generate an increase in the price level which goes beyond the capacity of producers to respond with an adequate increase in output. It implies that for a given level of money, higher prices imply a reduction of the quantity of the basket goods which can be bought because the value of available cash is reduced. The sources of cost-push inflation may also be manifold; an adverse supply shock such as an increase in factors prices e.g. the oil prices increases, rising labour costs exceeding any increase in productivity, and higher indirect taxation or the removal of subsidies. The immediate effect of the supply shock is thus a rise in the price level and a reduction in the level of output. Therefore, an adverse supply shock is undoubtedly an

unfortunate occurrence: it causes higher prices together with lower output as indicated by shifting the aggregate supply curve to the left. The demand-pull inflation and cost-push inflation are shown in Figures 3.1a and 3.1b, respectively.

Figure 3.1a Demand-Pull Inflation

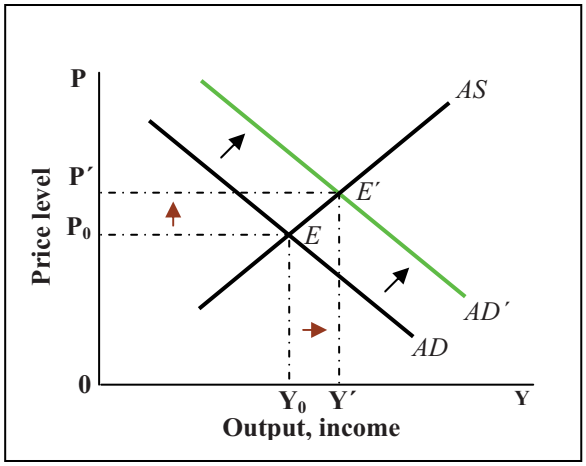
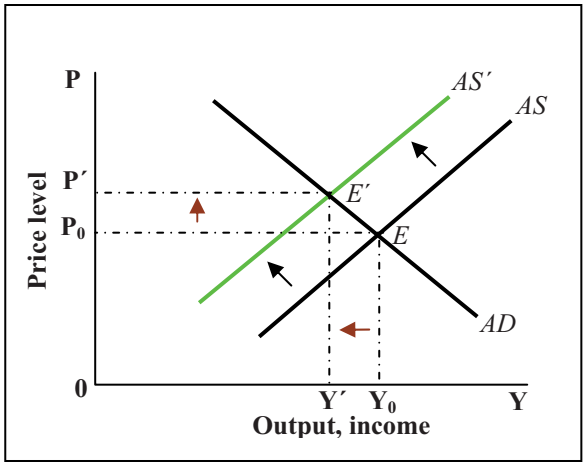


Figure 3.1b Cost-Push Inflation



Source: Dornbusch, et al, 2004

There is a very close relationship between the oil prices increases due to the reduction in subsidies on oil causing an adverse supply shock and an escalation of inflation rate by so-called cost-push inflation. Deaton (1989) brought to light that the reform of prices[40] and taxes, whether agricultural prices, consumer taxes, subsidies, or tariffs, have consequences for individual welfare through the distribution of real income, levels of production and consumption in addition to government revenues. This means that the price change affects consumers and producers in proportion to the amount of the commodity that they consume or produce, with net consumers losing from a price increase and net producers gaining. Government revenues and expenditures are also affected, directly if the price change is a change in a tax or subsidy and indirectly as consumers and producers react to the price change by altering their purchases and sales of items that carry taxes and subsidies. The gainers and losers from price changes can be identified, and the magnitudes of their gains and losses

40) Poor people are more vulnerable to policy changes and shocks than non poor people, Skoufias (2003). Therefore, the adverse shocks both natural disaster and economic crises lead to very sharp increases in poverty. Moreover, he underlined that natural disaster affect household welfare through the destruction of physical and human capital stock. In contrast, economic crises can affect household welfare through a variety of additional channels such as a slowdown in economic activity, changes in relative prices or the removal of price subsidies, cutbacks in the level of public transfer, and changes in the value of and returns to assets.

measured by utilizing nonparametric estimation techniques[41] to provide a straightforward and convenient way of displaying information. He concluded that real prices reforms sometimes involve quite large price changes, and these will generate important additional effects on production and consumption in Thailand. Estimates of the welfare effects of price reforms are harder to obtain because of supply and demand elasticities are not easily attained for many developing countries. Afterwards, he used spatial price variation[42] as recorded in household survey data to measure price elasticities, which was implemented for Cote d`Ivoire, Indonesia, Morocco, and the United States. However, he suggested that the appropriate treatment of quality variations and measurement error must be considered as the main innovations. In line with an approach used in exploring this relation, the following subsections provide some studies both micro and macroeconomics perspectives with a variety of economic models.

3.1.1 Previous Studies Using Econometric Models and Other Approaches

A number of preceding empirical studies demonstrated the correlation of the oil prices increases and inflation considerably by means of some different approaches such as Hooker (2002), Hunt et al (2002), LeBlanc and Chinn (2004), Cologni and Manera (2005), Barwell et al, (2007), Blanchard and Gali (2007), and Chen (2008). Hooker (2002) emphasized that since around 1980, oil price changes in the U.S. economy seem to affect inflation only through their direct share in a price index, with little or no pass-through into core measures, while before 1980 oil shocks contributed substantially to core inflation[43]. In addition, LeBlanc and Chinn (2004) highlighted that current oil price increases are likely to have only a modest effect on inflation in the U.S, Japan, and Europe. Additionally, Cologni and Manera (2005) examined the direct effects of oil price shocks on output and prices and the reaction of monetary variables to external shocks by using a structural cointegrated VAR model for the G-7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) for the period of 1980(1) to 2003(4). Their empirical results showed that for most of

41) see Jelliffe et al (2001) who illustrated the strengths and weaknesses of parametric and non parametric models with regard to population pharmacokinetic and dynamic models as well as Deaton and Serena (1997) regarding parametric and non-parametric approaches to price and tax reform.

42) see Deaton (1987) who estimated prices elasticities from cross-sectional data with spatial variation of price.

43) Core inflation is typically viewed as aggregate inflation excluding the contribution of price changes from volatile components such as food (due to weather conditions) and energy (due to supply shock), Roger (2000); Rich and Steindel (2005); and Silver (2006).

the countries considered, an unexpected oil price shock is followed by an increase in inflation rate and decline in output growth. The response of some central banks has been directed to reduce – through lower interest rates – the impact of the shock on output growth rate. In contrast, monetary authorities of most countries reacted by raising interest rates, suggesting a contractionary monetary policy directed to fight inflation.

Hunt et al (2002) investigated the macroeconomic effects of oil price shocks through distinguishing between temporary, more persistent and permanent shocks and the channels mechanism of them in United States, Euro area, Japan, and United Kingdom. Their specific attention emphasized the channels through which oil price increases can pass through into core inflation, a possible explanation of the asymmetric relationship[44] between oil prices and economic activity, the role of monetary policy credibility, the implications of delayed policy responses, and the relative merits of leaning in different directions when the correct policy response is uncertain. Three perspectives deserved particular emphasis consisting of (i) experience during the 1980s and 1990s does not provide a valid basis for diminishing the risk that persistent oil-price increases will pass through into core inflation; (ii) delay in responding to a persistent oil-price increase can have high macroeconomic costs if it leads to an erosion of monetary policy credibility; and (iii) in the face of significant uncertainties about behavioural relationships, monetary policy makers should interpret the data in a manner that errs in the direction of a more aggregative policy response to oil-price increases. Furthermore, Barwell et al (2007) explained that a rise in energy prices puts upward pressure on the prices of energy-intensive goods and services as well as affects both aggregate demand and potential supply side of the economy. The adjustment of wages and employment is particularly important in this regard that have allowed a more muted impact of higher energy prices on the economy than previously in the UK economy. Ultimately the impact on inflation will depend on monetary policy and the expectations of inflation. And the latest energy price increases

44) The economic activity is adversely affected by the negative oil price increases. It means that rising oil prices are indicative of the reduced availability of a basic input to production (slowing output growth and rising inflation) in United State as illustrated by Brown and Yücel (2002). Furthermore, Lardic and Mignon (2006) and Kilian (2008a) also concluded that rising oil prices seem to retard aggregate economic activity by more than falling oil prices stimulate it in United State, the G7, Europe and Euro area countries.

will require further adjustment in real consumption wages[45]–measured in terms of purchasing power over consumption goods– which may have implications for wage increase pressure if employees resist further erosions in their real take-home pay.

Blanchard and Gali (2007) characterized the macroeconomic performance of a set of industrialized economies in the aftermath of the oil price shocks of the 1970s and of the last decade for the 2000s on inflation and economic activity. They concluded that (i) the effects of oil price shocks must have coincided in time with large shocks of a different nature; (ii) the effects of oil price shocks have changed over time, with steadily smaller effects on prices and wages, as well as on output and employment; (iii) the response of the consumption wage to the marginal rate of substitution, and thus to employment, appears to have increased over time; (iv) the response of expected inflation to oil shocks has substantially decreased over time; and (v) the decrease in the share of oil in consumption and in production is large enough to have quantitatively significant implications. Furthermore, Chen (2008) examined the oil price shocks pass-through into inflation across countries and over time from 19 industrialized countries. The disaggregated CPI data was utilized to investigate the inflationary effects of oil price changes across different goods. A time-varying pass-through coefficient was estimated and the determinants of the recent declining effects oil shocks on inflation are investigated. A low inflation environment and decreasing energy intensity could explain the declining pass-through, whereas other factors such as exchange rate movements, trade openness, and monetary policy had played a minor role in the evolution of pass-through over time. His study showed that most of the inflationary effects of oil price changes fall on energy goods. The effects on other goods such as food, services, housing, and rents (non-energy consumptive goods and services) are modest and negligible. Moreover, Chen classified eight categories of energy goods such as fuel oil, gasoline, motor fuel, energy commodities, other household fuels, fuels, fuel and utility, and gas and electricity to know which type of energy price is most sensitive to the movements in crude oil prices. By using the energy-related disaggregated CPI data, all the estimates were large in magnitude and statistically significant.

45) Real consumption wages rise with an expansionary fiscal policy and fall with an adverse oil shock, but in neither case is labour supply much affected in OECD countries i.e. Canada, France, Germany, Japan, The United Kingdom, and the United States as highlighted by Hickman and Klein (1984).

However, among the eight energy goods, fuel oil, gasoline, and motor fuel were most affected by crude oil price changes. By and large, the oil shocks seemed to have modest effects on the aggregate CPI. But, investigating the disaggregated data revealed that the impacts of oil shocks on energy goods had become severe since the 1990s. Before that, for energy commodities i.e. gasoline and motor fuel, the pass-through increased from the 1970s, and afterwards began to decline after the 1980s. Therefore, the investigation of energy-related goods showed that the oil price pass-through to energy goods had indeed increased rather than decreased over time.

It is understandable prototype of relationship between the effects of adverse supply shock and on poverty caused by increasing the level of prices through inflation (Cardoso, 1992; Easterly and Fischer, 2000; Braumann, 2001, and Kpodar, 2006). Cardoso (1992) emphasized that inflation affects poverty mainly through its impact on real wages with specific disposition such as wages increase more slowly than prices of consumer goods in the time of rising inflation. Moreover, to reduce the impact of inflation by the implementation of income policy has not helped the poor. In line with this issue, Easterly and Fischer (2000) underlined that the poor suffer more from inflation than the rich[46] based on pooling data for 31869 households in 38 countries. In addition, they underlined with regards to direct measures of improvements in well-being for the poor-the change in their share of national income, the percentage decline in poverty, and the percentage change in the real minimum wage- are negatively correlated with inflation. It means that high inflation tends to lower the share of the bottom quintile and the real minimum wage which tends to increase poverty. Moreover, another comprehensive elucidation of this relation investigated by Braumann (2001) using a CGE model as main instrument brought to light that real wages fall sharply during periods of high inflation in Latin America (Argentina, Brazil, Costa Rica, Mexico, Peru, and Uruguay). Inflation reduces real wages through (1) a decline of the capital stock and (2) a shift in relative prices. The two

46) The rich are better able to protect themselves against, or benefit from, the effect of inflation than are the poor because they have better access to financial instruments for hedging against inflation in some way, while the small portfolios of the poor are likely to need a larger share of cash. The poor may also depend more than the rich on government-determined income (pension, subsidies, or direct transfers) that is not, if at all fully indexed to inflation. So, inflation will directly reduce their real income, Easterly and Fischer (2000).

effects are additive and make the decline in real wages exceed the decline in per capita GDP. This mechanism may contribute to rising poverty during periods of high inflation. Using an input-output approach, Kpodar (2006)[47] assessed the distributional effects of a rise in various petroleum product prices in Mali. The results show that although rising gasoline and diesel prices affect mainly non poor households, rising kerosene prices are most harmful to the poor. Overall, the impact of fuel prices on household budgets displays a U-shaped relationship to expenditures per capita. Regardless of the oil product considered, high income households would benefit disproportionately from oil price subsidies. This suggests that petroleum price subsidies are an ineffective mechanism for protecting the income of poor households if these support measures are not targeted.

The studies discussed above point out that high inflation due to oil price shocks are unpredictable events which can generate risky and uncertainty conditions with respect to gains and losses of households' well-being in the future. Therefore, the risky and uncertain events are highly related to the vulnerability of households to poverty - real wage decline - brought into being by inflation through oil price shocks as highlighted by Dercon (2001), Morduch (1994), Pritchett, et al (2000), Suryahadi and Sumarto (2001), and Chaudhuri, et al (2002). Dercon (2001) underlined that large economic shocks are passed on relatively fast via relative price changes. Morduch (1994) identified three sets of factors that contribute to greater vulnerability to poverty in low-income countries. The first ones are factors related to poor in low-income countries really depend on agriculture, weather and price variability. They are responsible for a large part of income fluctuations and, thus, poverty. The second set of factors: poorly developed financial institutions are responsible for lack of access to protection against risk such as credit, savings, or insurance. A final factor is the weakness of social insurance institutions. These factors stimulate the poor to utilize informal risk management strategies such as risk mitigation (ex-ante) and risk coping (ex-post). In spite of their informal mechanisms they have many limitations, like protecting the poor against small income shocks, but not big or persistence shocks, implying a trade off between risk mitigation

47) Almon, et al (1979) also accentuated that soaring oil prices, large increases in agricultural prices, and rising cost of physical materials and finished goods on world markets have set in motion major changes in the economy. To model these changes, it has been necessary to use input-output analysis since input-output models have the necessary detail to trace these effects.

and efficient production. Mitigating risk through crop diversification typically lowers the expected profit (Morduch, 1994), and provides ineffective protection concerning covariate shocks that affect everybody in the community. Moreover, it also relies on the local rules (no authentication) which emerge as big problem in the future.

Pritchett, et al (2000) examined the vulnerability in Indonesia using sets of panel data which indicate that, if the poverty line is set so that the headcount poverty rate is 20 percent, the proportion of households being vulnerable to poverty is around 30 to 50 percent. Besides the 20 percent which are currently poor, an additional 10 to 30 percent of the population is at substantial risk of poverty. Moreover, many "social protection" or "social insurance" schemes (e.g. unemployment insurance, disability benefits, and health insurance) attempt to reduce the variability of income by providing transfers not to the poor but to those that have experienced shocks. That is, while often both are referred to as "safety nets", there is an analytic distinction between social insurance programs in which the beneficiaries are contingent on the realization of some events- unemployment, flood, fire, health shock, old age, disability- and poverty programs in which the beneficiaries or participants are intended to be contingent on expenditure (income) level (safety nets). It may well be that insurance programs will be as important as poverty programs in reducing vulnerability. They argued that insurance programs act more as a mountain climber's "safety rope" (a rope that fixed at a progressively higher level and protects the climber from a fall of more than a fixed distance) than as a trapeze artists "safety nets" that catches only at the bottom[48]. Finally, vulnerability may alter the target groups for poverty or social insurance programs. Certain occupational groups such as landless rural workers, urban informal sector workers (e.g. scavenger), fishermen, certain social economic groups (e.g. widow) may have quite highly variable incomes and hence merit attention even if their average level of expenditures is not on average too much different from others.

Another empirical research conducted by Suryahadi and Sumarto (2001) which is based on cross-section data from household surveys from a combination of the National Socio

48) see Suryahadi et al (2000) who discussed noticeably with regard to who benefited from two Indonesian crisis programs i.e. safety nets and safety ropes on the poor or the shocked.

Economic Survey (SUSENAS) and the Village Potential (PODES) data set for the years 1996 and 1999, which are both collected by the CBS of Indonesia. It provides significant results that the level of vulnerability to poverty among Indonesian households after the crisis unambiguously increased from the pre-crisis levels. Furthermore, not only did the poverty rate in Indonesia increase significantly due to the crisis, but also much of this increase was due to a rise in chronic poverty. Likewise, the number of households with high vulnerability to poverty has almost tripled. As a result, the total number of households in the vulnerable category has jumped from 18 percent of the population in 1996 to more than one third of the population in 1999.

In another study on Indonesia's poor, Chaudhuri, et al (2002) assessed the household vulnerability to poverty by using cross-sectional data from Indonesia, particularly The Mini-SUSENAS survey which was first conducted in December 1998 and again in August 1999, and reached three main conclusions. First, the fraction of the population facing a non-negligible risk to poverty was considerably greater than the fraction that is observed to be poor. While 22% of the Indonesian population was observed to be poor in December 1998, they estimated that 45% of the population was vulnerable. Second, the distribution of vulnerability across various segments of the population can deviate markedly from that of poverty. They argued that this fact highlights the need for differentiating among various poverty prevention programs; i.e. between those aimed at reducing vulnerability and those with the objective of alleviating poverty. At the same time, it also calls for differential targeting of the two. Third, these authors found striking deviations among the sources of vulnerability for different segments of the population. For rural as well as for less-educated households, the main source of vulnerability appears to be low mean consumption prospects; for urban and for more highly educated households, on the other hand, vulnerability to poverty stems primarily from consumption volatility. This also has important implications for the types of poverty prevention programs that are needed to address the vulnerability of different groups within the population.

The evidences of some empirical studies discussed above in terms of households' level of and vulnerability to poverty is mainly obtained by emphasizing microeconomic perspectives. Especially, consumption expenditure or real income of households is used as important variables to investigate the vulnerability to poverty. However, results of such a microeconomic approach are difficult to be used for formulating policies with a macroeconomic perspective because it offers only a limited description regarding consumption expenditure or real income of households in the context of vulnerability to poverty. This condition highlights that micro and macroeconomic variables are highly correlated with each other. Hence, a complementary study is needed about Indonesia particularly the Aceh Province which offers clues to more comprehensive perspectives; especially with regard to the impact of oil price increases on real income of households on solving the essential problem; i.e. reducing households' level of and vulnerability to poverty during the years 2002 and 2005[49]. With respect to obtaining like-minded perspectives from the analysis both micro and macro assessments will be considerably useful to put all investigations together as a comprehensive investigation of the issues[50].

3.1.2 Previous Studies Using CGE Models

The relationship among the government policies on diminishing subsidies on oil, inflation rate, and poverty rate as well as vulnerability to poverty is not very simple. It takes a complex configuration in connection with the resulting impact on all markets in the economy; commodity, factors, financial, as well as foreign markets. A number of empirical investigations were undertaken to provide a better framework of the relation of macro and microeconomic effects. The former are analyzed using the general equilibrium approach which takes into account the impact of oil price increases on all segments of the economy including macroeconomic and microeconomic indicators such as poverty and income distribution issues by disaggregating household income level both rural and urban regions by

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49) In this study, the classifications of household levels (income) in the structural SAM framework of Aceh are determined by the poverty line which was published by Central Bureau Statistics of Indonesia in the year 2002 and 2005.

50) An estimate of total vulnerability (the covariance of idiosyncratic and covariant shocks) can be captured by a multi-year panel or some other device of measuring the interaction of the two trough time as emphasized by Thomas (2003).

means of applying the CGE-based model as a primary model. The foremost purposes of some studies are to recognize the impact of magnitudes of higher oil prices, particularly on the income distribution and the poor for instance Löfgren, 1995, UNDP, 2005, and Essama-Nssah, et al 2007. Löfgren (1995) concluded that there were two critical points by using different simulations in the short-run equilibrium effects in view of raising the price of domestic oil products to an international level and the impact of removing consumer subsidies influenced on slimming down in terms of the strongest fall in real GDP, household income diminution, the household consumption fall was relatively limited for food due to low income and price elasticity; most of the consumption cut affected other industrial goods and services, as well as employment.

In 2005, UNDP investigated the impact of higher oil prices on low-income countries and on the poor. Their findings showed that a sustained US$10 a barrel price increase would deliver a shock equivalent to a loss of the GDP 1.47 percent for the poorest countries (those with the GDP per capita less than US$300). Even the highest income group (over US$9000 per capita GDP) would suffer a loss of the GDP 0.44 percent. Some low-income countries suffer a shock of up to 4 percent of the GDP, and if oil prices were to stay at US$20 a barrel higher, the effect on the GDP would be doubled. Besides, households, which are consumers of certain petroleum products (kerosene, LPG and gasoline) and who also purchase other goods whose costs are impacted by oil product prices (diesel for transportation), will feel the effect of higher oil prices in their household expenditure, unless the government controls product prices and does not let them rise (thus increasing any subsidy element). In line with these issues, small- and medium-size enterprises are also likely to suffer from higher fuel costs, and the size of the price rise, coupled with the volatility of oil prices in general, points to a possible barrier to the sustainable development of these sources of growth. Finally, in countries where petroleum products are subsidized, the impact of higher oil prices will not be directly felt by households, but the worsening of the government fiscal position.

Furthermore, Essama-Nssah et al, 2007 investigated the structural and distributional consequences of a significant external shock-an increase in the world price of oil-on the South

African economy within a macro-microeconomics framework, particularly growth and poverty or income distribution. They concluded that a 125 percent increase in the price of the crude oil and refined petroleum reduces employment and GDP by approximately 2 percent, and reduces household consumption by approximately 7 percent. The oil price shock tends to increase the disparity between the rich and the poor, who are generally low skilled households. The adverse impact of the oil price shock is felt by the poorer segment of the formal labour market in the form of declining wages and increased unemployment. Moreover, unemployment hits mostly low and medium-skilled workers in the services sectors. But, high-skilled households, on average, gain from the oil price shock. Their income rises and their spending basket is less skewed toward food and other goods that are most affected by changes in oil prices.

Moreover, some other empirical studies conducted within the general equilibrium framework with reference to the impact investigation of increasing oil prices on the macro economy, employments, poverty, as well as on environment in Indonesia are Fatai et al, 2004; Hope and Singh, 1995; Handoko and Susilo, 2000; Hartono, 2002; Clements, et al., 2003; Azis, 2006; Eskeland et al, 1994; Resosudarmo, 2003; and Anshory and Resosudarmo, 2007. Fatai et al. (2004) investigated the causal relationships between energy consumption and the GDP in New Zealand, Australia as well as Asian countries including India, Indonesia, The Philippines, and Thailand. They summarized that there were a unidirectional link from real GDP to aggregate final energy consumption and a unidirectional link from real GDP to industrial and commercial energy consumption in New Zealand and also in Australia. However, in the case of the four Asian economies considered, a unidirectional link from energy to income was established for India and Indonesia and a bidirectional link for Thailand and The Philippines.

The different results between the more developed countries and the Asian developing economies may have resulted due to the different role that energy plays in each of the respective economies. Energy consumption is relatively low in New Zealand and Australia compared to the energy consumption level in the Asian countries. Furthermore, there is more

energy consumed by energy-intensive industries in the Asian economies than in New Zealand and Australia. Therefore, there is a significant indication that energy-intensive industries played a larger role in production than in New Zealand and Australia. This means that production increases follow lags in energy consumption in the Asian economies and it is opposite for New Zealand and Australia. Generally, energy conservation policies may not have significant impacts on real GDP growth in industrialized countries such as New Zealand and Australia compared to some Asian economies. Finally, their study strongly suggests using the computable general equilibrium model to avoid the limitation in capturing more disaggregated data such as data at the industry level.

Hope and Singh (1995) analyzed the effects of domestic energy price increases and the economic consequences on the poor, inflation, growth, public revenues, and industrial competitiveness in developing countries consisting of Colombia, Ghana, Indonesia, Malaysia, Turkey, and Zimbabwe. This study draws on the effect on households in various income classes dependent upon the energy commodity's share in the household budget and the price elasticity of demand. Thus, the effect on industry is generally modest, since the cost shares for energy typically range from 0.5 to 3 percent (with the typical value being 1.5). In addition, many industries are flexible enough to substitute when energy prices increases so that industrial output usually increases even with the higher energy prices. Alternatively, energy price increases reduce the drain on public resources significantly. The effects on inflation will generally not be severe and inflation may even be reduced in the intermediate to long run, through lowered public deficit. And income growth rates were higher during the years of price increases than before in about half of the case-study countries.

Handoko and Susilo (2000) observed the impact of oil subsidy reduction on the economic sectors (industries) and regional economic performances in Indonesia with respect to the short-run and the long-term analysis by using the Applied Computable General Equilibrium Indorani Model (ACGE-IM). This empirical study utilizes value added, domestic price, energy price, and employment as prominent variables to depict the performance of economic sectors in terms of the aggregate output as well as employment as the regional economic

performance indicator. The results of the study concluded that if oil subsidy reduces 40 percent, it will give a greater negative effect on the economic sectors and regional economic performance in the long-run. Oil subsidy reduction decreases value-added and employment performance, but increases the domestic price in almost all economic sectors. Moreover, refinery sector, transportation, as well as medium- and big-scale manufacturers received a greater influence than many others. According to regional economic performance as indicated by the Gross Regional Domestic Product (GRDP), South Sumatra, Riau, and East Kalimantan provinces received the greatest negative impact of oil subsidy reduction in the short-run in the amount of 2.33 percent, 1.82 percent, and 2.53 percent, respectively. However, in the long-run these provinces got the subsidy reduction effect approximately 4.48 percent, 3.40 percent, and 4.53 percent, respectively. Nevertheless, the smallest impact (0.3 percent) impinged on DKI Jakarta (the capital city of Indonesia) in the short-run and 2.49 percent in the long-run. More specific analysis relating to the policy impact of pricing energy on the economy and income distribution for DKI Jakarta was investigated by Hartono (2002) using Applied Computable General Equilibrium model. He concluded that the impact of pricing energy policy had affected some economic sectors seriously, particularly over the output and value-added of the economic sectors such as food, beverages, and tobacco industry; textile, convection, and leather products industry; and electricity, gas, and water supply industry. Sequentially, these effects impinged on the income of production factors i.e. informal labours belong to the poorest and poor households compared to other households. Afterwards, the income distribution across households worsened considerably. In addition, the poorest and poor households also faced the second round consequences of the pricing energy impact over higher consumption cost pattern and concurrently lower saving rate which generated the new serious problems for both these households.

Furthermore, Clements, et al. (2003) looked into the impact of higher petroleum prices on the aggregate price level, real growth, and income distribution appraised using the multisectoral CGE model in which applied and calibrated for Indonesia with the Keynesian and non-Keynesian scenarios. The results showed that although petroleum production will be unaffected ─assuming higher exports replace falling domestic production─ the output of other

sectors declines, owing to falling incomes and higher prices spurred by the reduction in subsidies. As expected, the impact on household consumption and poverty is much greater under the Keynesian scenario. Under that scenario, about two-thirds of the impact of subsidy reform on household consumption is due to second-round effects, underscoring the need to consider the impact of subsidy reform in a general equilibrium context. Specifically, poor households in the urban areas are particularly vulnerable to the subsidy reduction, owing to its effect on both prices and output[51]. Even when subsidy reform and lower budget deficit trigger higher private sector investment (the non-Keynesian scenario), the poor experience a reduction in real consumption. Generally, this study showed that a reduction in government subsidy raises petroleum prices and production costs throughout the economy. Consumer demand, production, and income decline as output prices increase and consumer purchasing power decreases. In addition, the stimulated results predict a slight increase in price level and a slight decrease in output. An important result is that urban household groups will be the most significantly affected by the subsidy reduction.

The further empirical study investigated in a comprehensive way allows looking at the different descriptions of decreasing the fuel subsidies policy in Indonesia, which was examined by Azis (2006) by using the Financial Computable General Equilibrium (FCGE) model with a poverty module to analyze alternative policy scenarios. In the summary of this study, the Indonesian government has some alternative policies in managing government budget pressure due to rising expenditures related to all sorts of subsidies, including those for the banking sector and domestic fuel consumption. In this case, the Indonesian government has opted to cut only the fuel subsidies in which such a policy is ill-advised. A partial reduction, not an enormous cut, would have been sufficient if it was complemented with a fractional cut of sovereign domestic debt payments. Based on a set of simulations on the FCGE model, it is shown that slicing subsidies for the banking sector, providing that the saved money is spent on agricultural-related infrastructures, could produce a favourable

51) Actually, both urban poor and non-poor groups are affected with the differences across groups in factor endowments and employment patterns. Another factor is the composition of consumption: higher-income groups consume more petroleum products and utilities, whose prices increase most significantly with subsidy reduction. Lower-income groups devote a larger share of consumption to agricultural goods, whose price is less sensitive to changes in domestic petroleum prices; see Clements, et al (2003).

outcome in terms of income distribution and poverty conditions without deteriorating the macroeconomic stability or injuring the investors' confidence. Comparing to the fuel oil subsidies cut, the number of population affected by such a policy will also be much smaller. Thus, a drastic and massive reduction of fuel subsidies is unnecessary, especially considering the adverse socio-economic and political repercussions of it. Moreover, Anshory and Resosudarmo (2007) looked into searching for equitable energy price reform for Indonesia by using the CGE model based on the ORANI-G model. The simulations illustrated that the reform could have been progressive if it only increases vehicle fuel prices. However, if at the same time it also increases the price of domestic fuel (kerosene), it tends to increase inequality, especially in urban areas.

Another view of study in accordance with the relationship between energy pricing and air pollution in Chile and Indonesia was investigated by Eskeland et al. (1994), who concluded that energy pricing is, for air pollution, a powerful indirect tool for reducing emissions. Whether it is attractive as one instrument among others depends on the costs of monitoring and enforcement associated with more direct instruments, such as emission taxes, or fuel substitution and energy conservation. Resosudarmo, in his empirical study (2003) in accordance with the expected impact air pollution policies on national economic performance and on household income for various socio-economic groups in Indonesia, suggested that an implementation of policies to improve urban air quality might also induce a higher GDP and increase the income of poor households. Thereafter, several important recommendations can be drawn from the results of the simulation described in his paper: (1) to be able to reduce all air pollution concentration in urban areas to below the WHO allowable level of air pollution, air pollution abatements policies should not only be applied to mobile sources, but also to stationary sources of air pollution; (2) to be able to avoid more air pollutant health illnesses occurring, air pollution abatement policies should be implemented as soon as possible; (3) the decision to produce unleaded gasoline should be accompanied by a requirement to install catalytic converters on new cars; (4) although the impacts on the economy and on air pollution are small, implementing Vehicle Emission Standard Policies are good for the economy and for household incomes; and (5) in implementing the Gasoline and HSDO

(High-Speed Diesel Oil) Pricing Policy, it is important to make sure that the probability of having an optimistic outcome is higher than a pessimistic outcome.

In sum, the previous studies using different tools in investigating the impact of oil price increases on the whole economy, especially on the poor through higher inflation will facilitate this study to recognize the contemporary relationship of its impact at different scales and perspectives. Although with different policy implications, the previous studies are not necessarily contradictory to each other. Hence, this study emphasizes on the impact of oil prices increases on the poor in addition to the vulnerability to poverty at regional level i.e. Nanggroe Aceh Darussalam by using and comparing the results from two years of SAM data in 2002 and 2005. In order to capture the main point of the study, the households are classified into five groups i.e. the poorest, the poor, the middle-income households, the rich, and the richest both in rural and urban areas which rely on the poverty line published by the CBS of Indonesia for the years 2002 and 2005. These household income levels enable to describe the main concerns of this study which will be focused on the poverty and the vulnerability of households to poverty in Aceh. Therefore, it employs the standard CGE model from the IFPRI (International Food Policy Research Institute) using specialized software - GAMS (General Algebraic Modelling System).

3.2 Concept and Theory for Analyzing the Impact of Government Policies on Poverty

Summing up from the preceding sections as debated above, the impact of the government policy change with regards to cutting subsidies on oil is a tricky situation. On one hand, the government enables to decrease government expenditure burden by means of some adjustments of domestic oil prices to the world oil price changes. On the other hand, it widely affects on the whole economy at national as well as regional level and particularly poor households whether they are in rural or in the urban areas through higher inflation rate. The consequences of higher prices worsen the purchasing power of the poor as a result of their real income goes down. Afterwards, the deterioration of real income will force the poor to survive under the threshold of poverty line. Harmfully, they are trapped into the chronic

poverty. Furthermore, certain households will face the vulnerability to the oil prices increases so even if they are currently non-poor households, they would fall below the poverty line.

There is, therefore, a strong association between the effect of government subsidy reduction on oil which induce an increase in oil prices and the poverty together with the vulnerability to poverty. Nevertheless, it is not very simple relationship. The consequences of increasing oil prices take a multifaceted configuration because it will have an effect on the all markets in the economy encompassing the commodity market, money market, factors market, as well as foreign market[52]. The relationship of these all markets can be reviewed partially consisting of demand-side equilibrium (i.e. classified into the real commodity market and real money market) and supply-side equilibrium (i.e. demand and supply in the labour market). In the beginning, demand-side equilibrium represented by real commodity market equilibrium (the IS curve) is:

$$y = c(y - t(y)) + i(r) + g \quad \text{..... (1)}$$

where y = real GNP (Gross National Product),
$c(y\text{-}t)$ = real consumer expenditure as a function of real disposable income
$t(y)$ = real tax revenue as a function of real GNP
$i(r)$ = real investment demand as a function of interest rate
g = real government purchases of goods and services

and real money market equilibrium (the LM curve) is:

$$\frac{\overline{M}}{P} = l(r) + k(y)) \quad \text{..... (2)}$$

where $\frac{\overline{M}}{P}$ = real money supply
$l(r)$ = speculative demand for money as a function of interest rate
$k(y)$ = transactions demand for money as a function of real GNP

Afterwards, real commodity market equilibrium (the IS curve) and real money market equilibrium (the LM curve) can be illustrated by the following Figures 3.2 and 3.3.

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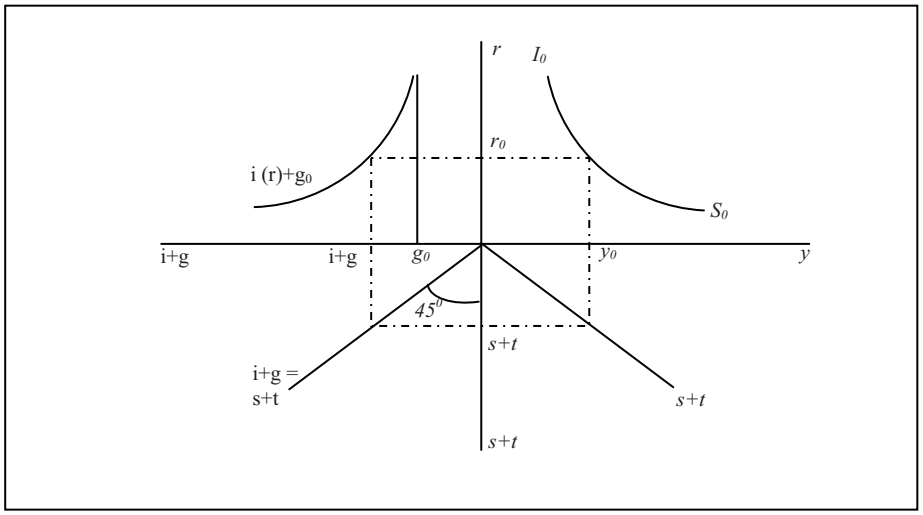
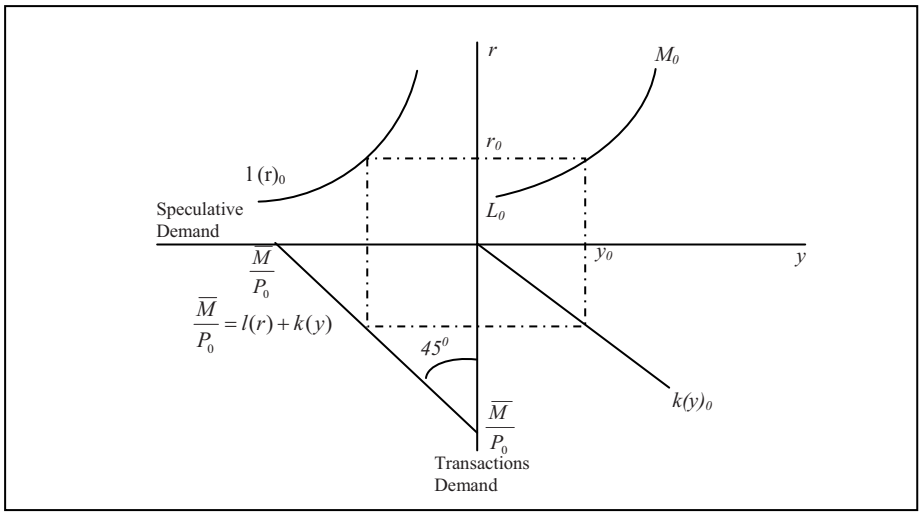
52) There is the close link between oil prices and aggregate macroeconomic performance, Aguiar-Conraria and Wen (2007), Bernanke, et al (2004), Dotsey and Reid (1992), Ferderer (1996), Hamilton (1996), Fin (2000), Leduc and Sill (2004). Sadoulet and Janvry (1995) highlighted that CGEs are fundamentally equilibrium model. Thus the proper time frame in which to apply them is the time span that it takes for all markets to reach new equilibrium after being hit by a shock.

Figure 3.2 Commodity Market Equilibrium (The IS Curve)



Note : *y* refers to real GNP (Gross National Product), *c* refers to real consumer expenditure as a function of real disposable income, and *s* refers to real saving, *t* refers to real tax revenue as a function of real GNP, *i* refers to real investment demand, and *g* refers to real government purchases of goods and services.
Source: adapted from Branson, 1989

Figure 3.3 Money Market Equilibrium (The LM Curve)



Note : $\frac{\overline{M}}{P}$ refers to real money supply, *l* refers to speculative demand of money as a function of interest rate, and *k* refers to transactions demand of money as a function of real GNP (Gross National Product)
Source: adapted from Branson, 1989

Deriving from two graphical representations demonstrated in Figures 3.2 and 3.3 give comprehensible framework concerning the equilibrium pairs of *r* and *y* in the commodity market ($y = c(y - t(y)) + i(r) + g$ *or* $y - c = s(y - t(y)) + t(y) = i(r) + g$) as indicated by

the IS curve and the equilibrium pairs of r and y in the money market ($\frac{\overline{M}}{P} = l(r) + k(y)$) as stated by the LM curve. By placing these two curves in the same quadrant, it gives equilibrium in both market with the single r (interest rate) and y (level of income). This intersection of the IS and LM curves determines the equilibrium level of income and the interest rate, given the price level P_0. Afterwards, if the price level increase, the real money supply shrinks and excess demand is created in the money market. This excess demand raises interest rates, reducing investment demand and equilibrium income, and vice versa. This relationship is shown as the economy's demand curve (the aggregate demand curve). Demand curve illustrates that as the price level p increases, the equilibrium output y demanded in the economy decreases and vice versa, (Branson, 1989). Therefore, changes in equilibrium variables on the demand side of the economy as a result of price changes are movements along the demand curve. Changes in exogenous variables on the demand side, such as g or M or the tax schedule, or the shifts of functions like the saving function or the transactions demand for money, shift the demand curve. Demand-side equilibrium classified into the real commodity market and real money market is indicated by equation 3 as follows.

$$\frac{dy}{dP} = \frac{-\frac{i'}{l'}m}{1 - c'(1 - t') + \frac{i'k'}{l'}} \quad \text{..... (3)}$$

where m = the real money supply equals $\overline{M} / P_0$
all other variables as described above

On the other hand, the supply-side equilibrium is indicated by the relationship between prices, wages, and the level of employment that would occur when an economy is at or near full employment. In other words, this shows a correlation among demand for labour and supply for labour in the labour market as well as production function as denoted by the subsequent equations respectively as follows:

$$W = P.\frac{\partial y}{\partial N} = P.f(N) \text{ or } w \equiv \frac{W}{P} = \frac{\partial y}{\partial N} = f(N) \quad \text{.....(4)}$$

where W = nominal wage,
w = real wage,

$\frac{\partial y}{\partial N}$ = marginal product of labour,

P = actual price level,

N = labour input.

$$w^e \equiv \frac{W}{P^e} = g(N) \text{ or } W = P^e.g(N) \text{ and } w = \frac{W}{P^e}.\frac{P^e}{P} \text{ or } w = \frac{P^e}{P}.g(N) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where W = nominal wage,

w = real wage,

w^e = expected wage level,

P = actual price level,

P^e = expected price level,

N = labour input

$$y = y(N; \overline{K}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

where y = production function (real output) as a function of labour input (N) and constant capital input (K),

N = labour input,

$\overline{K}$ = capital input.

Moreover, the labour market equilibrium condition is $f(N) = \frac{P^e}{P}.g(N)$ or $P.f(N) = P^e.g(N)$, where $P^e = p(P)$ or supply-side equilibrium (i.e. demand and supply in the labour market) expressing as follows:

$$\frac{dy}{dP} = \frac{\partial y}{\partial N}\frac{w(i - p')}{g' - f'} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

where $dy = (\partial y / \partial N)dN$) = the marginal product relationship

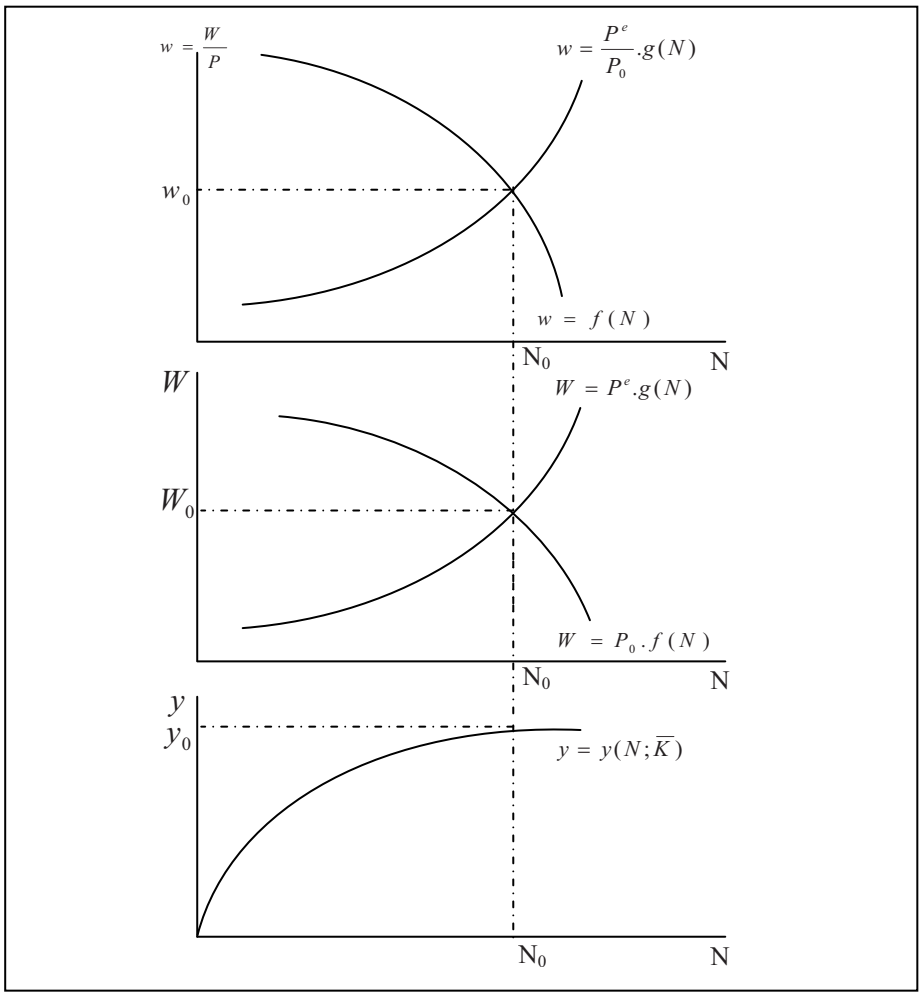
$0 < p' < 1$) = price expectations

all other variables as described above

Then an aggregate supply curve which illustrates the labour market in equilibrium as well as a production function that relates the supply of output y to employment N can be depicted by Figure 3.4. Actually, there are two polar assumptions about price expectations i.e. (i) $p' = 0$ in the extreme Keynesian case and (ii) $p' = 1$ in the classical case that give very different results for the aggregate supply curve. Based on these assumptions, the Keynesian case takes shape of the aggregate supply curve that is gradually sloping but the classical case's aggregate supply curve forms perfectly steep one. Therefore, the aggregate supply curve can be derived in the general short-run static model in which $0<p'<1$. This is the model in which expectations

adjust to changes in the actual price level, but not fully. In addition, the aggregate supply curve gives the reaction of equilibrium output supplied, *y*, as the price level changes, with a given production function *y(N; K)*, marginal product of labour function *f(N)*, and labour-supply function *g(N)*. A change in any of these relationships will shift the aggregate supply curve in *P, y* space while holding the others constant. This exercise should point the way for more complicated cases in which more than one of these functions shifts, such as a change in technology that shifts both *y(N; K)* and *f(N),* (Branson, 1989).

Figure 3.4 Labour Market Equilibrium



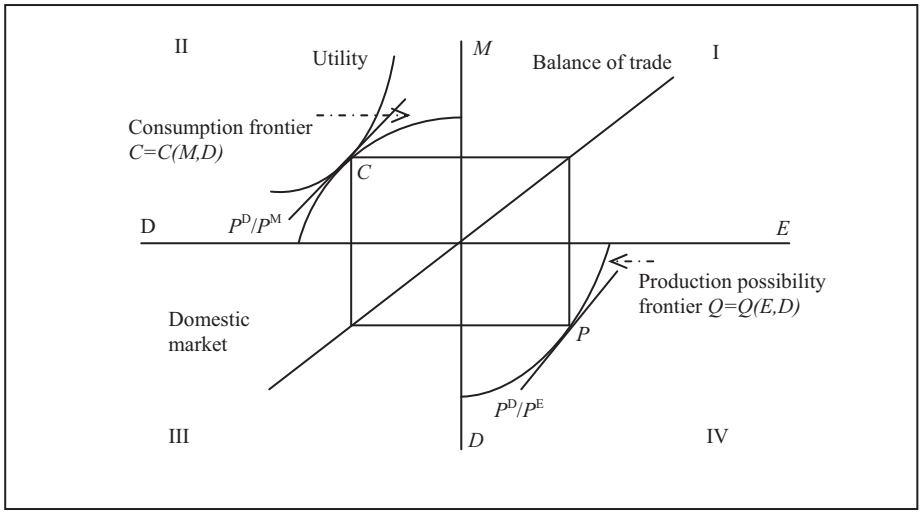
Note : *w* refers to real wage, *W* refers to nominal wage, P_0 and P^e refer to actual price level and expected price level, and *y* refers to production function (real output) as a function of labour input (*N*) and constant capital input (K).
Source: adapted from Branson, 1989

In summary, the combination of aggregate demand and aggregate supply curve provides the equilibrium values for the price level *P* and output (income) *y*, and for employment *N* and the

interest rate *r* which captures all markets in the closed economy i.e. the commodity, money, and labour markets. In general, this condition implies that the intersection of the aggregate demand and aggregate supply curves give the general equilibrium in P_0 and y_0 in all markets (see Figure 3.1a and 3.1b).

Relying on flow of thoughts represented above in this section, the subsequent Figure 3.5 gives more comprehensive relationships of all markets including foreign market known as an open economy in which illustrate the general equilibrium condition. This implies that the Figure 3.5 become an important starting point of this study to show an interdependent relations of all variables in the economy. By using this figure, this study undertakes to capture the wide-ranging analysis by utilizing general equilibrium framework pertaining to the impact of the oil prices increases on account of the oil subsidy reduction on the poor in Nanggroe Aceh Darussalam Province. Theoretically, an all-inclusive logical framework of the relations among all markets in one country is presented by Figure 3.5 as follows.

Figure 3.5 Macroeconomic Equilibrium

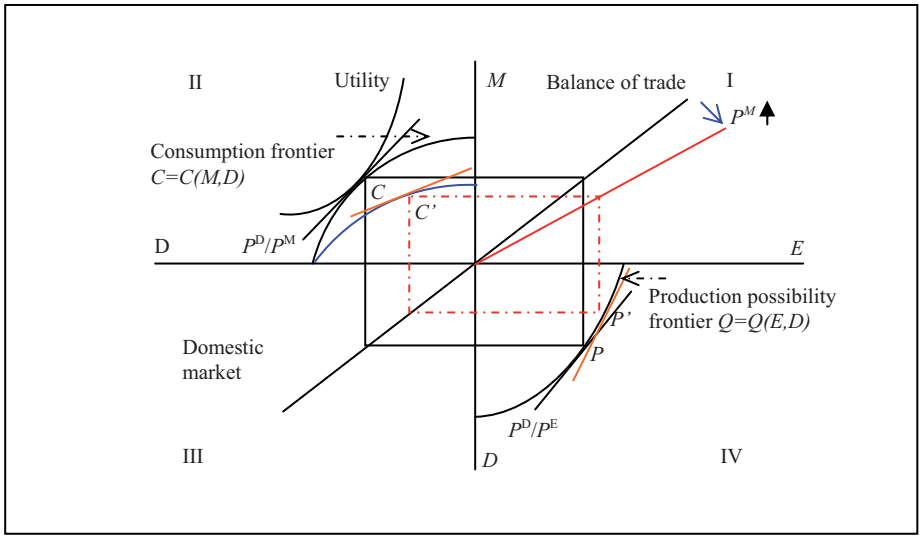


Source: Devaragan, Lewis, and Robinson, 1990 and Sadoulet and Janvry, 1995

Figure 3.5 presents an illustration of relationship mechanism of the markets in equilibrium framework together with assuming that all factors of production are fully employed. Quadrant I points to a balance of trade line that goes through the origin with a slope equal to one. It implies that the prices of imports and exports are equal. Then, quadrant II shows the consumer demand behaviour of consuming the combination of *M* and *D* at point *C*. Point *C* depicts

tangency of the utility curve and the consumption possibility frontier which determines the equilibrium relative price *M* and *D* that is P^D/P^M. Quadrant III represents the domestic market which delivers the domestic production to the consumer. Lastly, quadrant IV stands for the production quadrant where the point *P* constitutes the relative price of exports and domestic commodity (P^D/P^E) as depicted by the tangent to the production possibility frontier. In general, the economy produces at point *P* and consumes at point *C*. Consider what would happen if an adverse terms of trade shock signified by an increase in the world oil price. This is demonstrated through the following Figure 3.6 corresponding to a rotation of the balance of trade line on account of the imported good price increase such as oil. The impact of this transformation will generate a new equilibrium for the whole economy. The consumption of both import and exports good decrease which reach a new equilibrium at point *C'*, but the change of consumer demand behaviour crucially depend on the elasticity of both goods. On the production side, a new equilibrium is at point *P'*. Subsequently impact of the world oil price has forced the higher volume of exports which generates foreign exchange to provide financial support towards the more expensive import together with a higher price ratio P^D/P^E in attracting resources away from *D* to *E*. In line with managing real depreciation of the exchange rate, the government initiates to implement another alternative such as reducing oil subsidies through increasing oil prices domestically in order to keep healthy government fiscal revenues in the future.

Figure 3.6 Changes in World Oil Price and Reducing Oil Subsidy



Source: Devaragan, Lewis, and Robinson, 1990 and Sadoulet and Janvry, 1995

Nowadays, the computable general equilibrium models (CGE) is often used by the economists owing to its capacity to combine features from the different types of models based on the framework of socio-economic structure of a SAM, with its multisectoral and multi-class disaggregation. They are, in spirit, close to multi-market models, in which agents' decisions are price responsive and markets reconcile supply and demand decisions. They additionally encompass a certain number of macroeconomic components, such as investment and savings, balance of payments, and government budget. Thus, they are best chosen for policy analysis when the socio-economic structure, prices, and macroeconomic phenomena all prove important (Sadoulet and Janvry, 1995). Afterwards, therefore, CGE models have been built to simulate the economic and social impacts of a wide range of scenarios such as identifying foreign shock, such as adverse changes in the terms of trade (e.g., an increase in the price of imported oil or a decline in the price of the country's main exports) and forced reduction of foreign borrowing, investigating the changes in economic policies on taxes and subsidies for the sake of looking at changes in the size and composition of government current expenditures and investment, as well as examining changes in the domestic economic and social structure (e.g., technological change in agriculture, asset redistribution, and human capital formation).

In line with the previous studies and theoretical framework as highlighted above, this empirical study will put emphasis on merely investigating the impact of the increase in oil prices in consequence of cutting subsidies on oil, especially gasoline, diesel, and kerosene prices on the poor in the NAD Province. At the end of this study, the results will demonstrate the socio-economic pressure taking into account the vulnerability of the households to poverty in Aceh due to negative impact of the oil prices increases. In order to describe a wide-ranging insight of the impact of the oil prices increases on the poor capturing the vulnerability of households to poverty, this study utilizes three approaches comprised of the Descriptive Analysis Approach (DAA), the SAM model, and the CGE-based model. The SAM model is accompanied with the accounting multiplier decomposition analysis as well as direct, indirect, and global accounting multiplier analyses. Analyses derived from these three models will be extensively discussed at the following section along with particular data used by every approach.

4. RESEARCH METHODOLOGY

4.1 Data and Related Information

The main purpose of this study is to investigate consistently the impact of increase in oil prices implemented by cutting oil price subsidies on the poor. In line with this issue, the study specifically makes an effort to identify how large shock of the government energy policies affect the poor as well as the vulnerability of households to poverty in Nanggroe Aceh Darussalam Province focusing on the income structure of households. Firstly, the study starts by qualitatively identifying the crucial aspects of the poor in accordance with the vulnerability of households to poverty as a result of the oil prices increases. It can be captured by qualitatively looking into the households' characteristics such as household size (number of household members), level of education of household head, main profession of household head, economic condition of household, and the behaviour of oil price changes within the framework of micro-level analysis[53]. This work employs the Descriptive Analysis Approach (DAA). Secondly, this empirical study makes strong efforts to analyze more comprehensively on macro-level analysis aimed at looking into the influence of the oil prices increases on the poor in addition to the vulnerability of household to poverty as indicated by the configuration of household economic conditions. The results of this work are expected to aid the formulation of the best alternative policies to the government as a general agenda with regard to the negative consequences of increasing oil prices on the poor as well as the vulnerability of households to poverty. To delve into these issues this work makes use of two approaches consisting of the SAM-based model which is focused more on the accounting multipliers effect looking into the income distribution analysis across institutions. And the CGE model which investigates the extensive impact of the oil prices increases on the poor by presenting the description of economic conditions of each household group together with the local government income and expenditure; and lastly the performance of economic sectors.

The data used in this study originates mainly from two sources: particularly primary data (cross-sectional data) and secondary data (mostly SAM data). In order to observe the characteristics of the poor and also to find out the vulnerability of households to poverty in

53) The qualitative data will be highly valuable way as contextual methods to capture a social phenomenon within its social, economic, and cultural context, Dercon (2001).

Aceh, the study begins with employing the primary data from field observations collected through in-depth interviews based on a questionnaire focusing on local community conditions in Aceh at urban and rural areas. The primary data sources are collected from 21 regencies, 151 districts, and 744 respondents of which 222 are from urban areas and 522 from rural ones. For selecting the respondents, the Simple Random Sampling Method is employed. This information included in this study is complemented by the National Socio-Economic Survey (SUSENAS) data published by the CBS of NAD Province and the CBS of Indonesia together with some other data sources related to the focal objectives of the analysis such as the consumer price index (CPI), the number of the poor and poverty line for Aceh, the number of informal and formal labour by economic sectors, as well as oil supply and oil stock distribution by users in Aceh.

It is important to underline that if we speak of oil prices three types of fuel prices are referred to; gasoline, diesel, and kerosene prices. All increases of oil prices analyzed in this study are assumed to be caused by reducing the subsidies the government pays for these types of fuel. To explore the all-embracing effects of the increase in oil prices on the poor and the vulnerability of households to poverty, this study also utilizes SAM Data about Aceh of 2002 and 2005[54]. This SAM data framework consists of the structure of production activities that is similar to the input-output table; domestic commodities; factors of production sorted into labour classified into formal and informal labour and non-labour (i.e. capital); and institutions categorized by households, firm and the government. Specifically, the composition of production activities are partitioned into 13 economic sectors, 13 domestic commodities, and 3 production factors such as formal labour, informal labour, and capital (see Appendix 2).

In line of the main purpose of this empirical study which investigates the impact of oil prices increases on the poor both in rural and urban areas, households are classified into five categories: the poorest, poor, middle income, rich, and the richest households. This holds for both rural and urban regions. The classification of households into these five groupings is

54) Two periods of SAM data which are utilized in this study are highly expected to be able in demonstrating a description of the vulnerability of households to poverty in Aceh through comparing the results obtained by means of the SAM-based model and particularly the CGE-based model.

dictated by the data availability on various poverty lines as published by the CBS of Indonesia. This is an important indicator to determine households' income categorization. In addition, another set of SAM data presents the accounts for the exogenous variables such as capital balance, indirect taxes minus subsidies, as well as the rest of the world. Furthermore, this study is also strongly complemented by other macroeconomic data of Aceh such as the additional secondary data published by the CBS of Indonesia, the CBS of NAD Province, and PERTAMINA (State-owned oil company of Indonesia) in Aceh in formulating and applying the CGE model.

4.2 Analytical Method

To scrutinize the foremost goal of the study on the impact of the increase in oil prices on the poor in Aceh as a consequence of reducing oil price subsidies, the study makes use of three approaches with the intention of obtaining the comprehensive and cohesive insights on the configuration of poverty rate changes in addition to the vulnerability of households to poverty in Aceh. They are the Descriptive Analysis Approach (DAA), the Social Accounting Matrix (SAM) approach and the analysis by using a Computable General Equilibrium (CGE) model. As regards the former, the DAA approach is to capture the micro situation of the poor in terms of their characteristics and their reactions towards oil price movements in Aceh. The SAM approach is based on two analyses; decomposition accounting multiplier analysis and direct, indirect as well as global accounting multipliers effect relating to income distribution perspective. The CGE model strengthens the earlier evaluations by comparing the results from two years of SAM data in order to obtain an indication of the macroeconomic impact particularly on the poor and their vulnerability to poverty in Aceh along with the income distribution across households. Later, it is followed by performing some simulations. By using these approaches independently the study will be able to show in detail the effects of the oil prices increases on the poor as well as the vulnerability of households to poverty in Aceh.

4.2.1 Descriptive Analysis Approach

The Descriptive Analysis Approach implemented at the beginning of the quantitative assessment in this study is to provide actual information from a primary data set collected by

field observation and in turn, to prepare it qualitatively through simple performances such as a graphical and tabular description based on calculating distribution frequency measurements to summarize the data. It is indeed important to capture fundamental representations of the characteristics of households; especially for poor households such as household size, income scheme of households, education level of the household head, economic conditions of households, the main profession of the household head, reactions to oil price changes and to actions of the government which are needed to dampen the impact of the oil prices increases, and the other issues in view of this study's assessment. Furthermore, they provide a description of current situation, both in rural and in urban levels taking into considerations of the behaviour of respondents in facing the government policy changes; in particular, increasing oil prices.

4.2.2 SAM Approach

To recognize the direct, indirect and global accounting multipliers effect of the oil prices increases on the poor and afterwards the vulnerability of households to poverty within the income distribution perspective, the study utilizes the SAM-based model. Actually, the SAM-based model is a wide-ranging conceptual framework that figures out the whole interdependent socio-economic system and is generally designed to convey a set of information in connection with a comprehensive way of the initial distribution of institutions' consumption, income, and factors of production on the whole economy. Thus, as an extensive data framework, the SAM also makes it possible to provide a better 'shock story' by calculating its accounting multiplier decomposition in consequence of the government's policy transformations on socio-economic structure as well as on the entire economy.

In history, the genesis of the SAM framework goes back to Stone's pioneer work on social accounts. Subsequently Pyatt and Thorbecke (1976) further formalized the SAM and showed how it should be used as a powerful conceptual and modular framework for policy and planning objectives. Even though there is no standard structure for the SAM due to its dependence on the objectives of the study, the major connections among its principal account can be recognized in comparable causal interrelationships. Therefore, it can provide useful information with regards to such key issues as intersectoral linkages (i.e. between agriculture

and industry), interregional flows within an economy, the determination of the income distribution by socio-economic groups given the structure and technology of production and the resource endowments of these groups, and the relationship between a given regional economy and other regional economies within a nation as well as with the rest of the world. Concomitantly, more effective policies can be developed with respect to the provision of educational, medical and other facilities among poor and rich regions. In conclusion, the SAM is a thoroughly comprehensive, disaggregated, consistent, and complete data system that facilitates the capture of the interdependences that exist within a socio-economic system.

Furthermore, the SAM constitutes a square matrix in which each transaction or account has its own row and column. The payments (expenditures) are listed in columns and the receipts are recorded in rows. As the sum of all expenditures by a given account (or sub account) must equal the total sum of receipts or income for the corresponding account, row sums must equal the column sums of the corresponding account. Furthermore, under certain assumptions, such as excess capacity (i.e. availability of unused resources) and fixed prices, the SAM can be used as the basis for simple modelling (Defourny and Thorbecke, 1984). More specifically, the SAM encompasses two accounts: endogenous and exogenous accounts. The endogenous accounts include production activities (economic sectors), factors of production (labour, capital and land), and institutions (households, firms[55], the government). Meanwhile, exogenous accounts consist of the government, capital, and the rest of the world. Therefore, the analysis of the effect of exogenous adjustments on the whole socio-economic system could be explored by accounting multiplier analysis, which requires partitioning the SAM into endogenous and exogenous accounts.

Table 4.1 illustrates in a simplified way the framework for formulating a SAM in which columns and rows are partitioned into 5 x 5 groups. As can be observed from that table, the SAM is put together in a square-matrix format which often is called Matrix T consisting of submatrices T_{ij} which constitute transaction matrices inter blocks within endogenous account.

55) Microeconomists usually model a firm as a single entity with a clear goal that it pursues without any wasted effort or the traditional neoclassical firm is represented by a production function that summarizes the relationship between inputs and output given the current technology. Regardless of industry structure, each firm is assumed to maximize profits (Waldman and Jensen, 1998).

Matrices X_{ij} indicate the income of endogenous accounts from exogenous accounts that are also called injections. Matrices I_{ij} point out the expenditure of endogenous accounts pay to exogenous accounts (leakages of endogenous accounts). Matrix R_{ij} represents transaction activities between exogenous accounts. Matrices Y_i (the column vector) demonstrate total incomes received by endogenous accounts. Finally, matrices Z_j (the row vector) are total expenditures spent by endogenous accounts. Table 4.1 shows the simplified schematic SAM pertaining to the partition of construction and transformations (matrices) involving the three endogenous accounts and two exogenous ones as follows:

Table 4.1 Simplified Schematic Social Accounting Matrix (SAM) Table

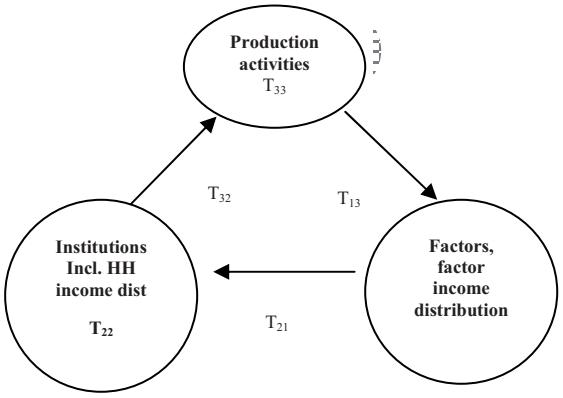
				EXPENDITURES					
				Endogenous Accounts			Exogenous Accounts		
				Factors	Institutions	Production Activities	Combined Capital	Rest of the World	Total
				1	2	3	4	5	6
RECEIPTS	Endogenous Accounts	Factors	1	0	0	Income (Value-added) by Prod-uction Factor T_{13}	X_{14}	X_{15}	Income of Factors Y_1
		Institutions	2	Income Distribution to HH & Other Institutions T_{21}	Transfers, Taxes, & Subsidies T_{22}	0	X_{24}	X_{25}	Income of Institutions Y_2
		Production activities	3	0	Institutional Demand (HH & others) for Goods & Services T_{32}	Inter-industry Demand T_{33}	Gross Capital Formation X_{34}	Exports X_{35}	Gross Demand (Gross Output) Y_3
	Exogenous Accounts	Combined Capital	4	I_{41}	Domestic Savings I_{42}	I_{43}	R_{44}	Balance of Current Account R_{45}	Aggregate Savings Y_x
		Rest of the World	5	I_{51}	Imports of Complementary Goods I_{52}	Imports of Competitive Goods I_{53}	R_{54}	R_{55}	Total Foreign Exchange Outflow Yx
	Total		6	Outlay (Income) of Factors Z_1	Expenditure of Institution Z_2	Gross Output Z_3	Aggregate Investment Z_x	Total Foreign Exchange Inflow Z_x	

Source: adapted from Defourny and Thorbecke, 1984 as well as Pyatt and Round, 1979

Not surprisingly, the principle of double entry book keeping is utilized for the SAM construction with the row total of the SAM accounts (expressing receipts) equalling to the corresponding column totals (expressing the expenditures). These matrices are, respectively, T_{13} which distributes the value added generated by the various production activities as income

accruing to the factors of production; e.g., the income (wage or salary) generated by the labour in the various production sectors. T_{33} represents intermediates input requirements (i.e. the input-output transactions matrix) of the production sectors while T_{21} maps factor income into the various household categories as well as into the government, and the firms. Households are categorized according to socio-economic characteristics. It means that this matrix represents the distribution of income of production factor to institutions. Matrix T_{22} captures income transfers within and among groups of institutions like e.g. government subsidies to households, transfers of firms to households, or shifting income from one household category to another one. Finally T_{32} depicts the expenditure pattern of the various institutions (household groups, firms, and the government) for the different commodities (production activities) which they consume. Figure 4.1 illustrates the major interrelationships among endogenous accounts as simplified Table 4.1.

Figure 4.1 Simplified Interrelationships among Principal SAM Accounts (Production Activities, Factors, and Institutions)



Source: Defourny and Thorbecke, 1984.

The elements of the endogenous transaction matrix T in Table 4.1 can be expressed as ratios of their corresponding column sums, i.e. as average expenditure propensities (AEP). This new matrix is abbreviated by A consisted of submatrices A_{ij} which can be formulated as the following equation:

$$A_{ij} = T_{ij} Z_j^{-1} \quad \text{.....} \quad (8)$$

where A_{ij} = the average expenditure propensities (AEP) of rows i from columns j,
T_{ij} = account matrix of row i for column A j,
Z_j^{-1} = column total of expenditure of endogenous accounts.

In addition, there is an important gesticulation that must be highlighted with respect to the element of the matrix of average expenditure propensities that is it can be the matrix of direct influences[56]. In other words, the matrix A of the AEP consists of the coefficients which represent the direct pressure of one sector to the other sectors. Furthermore, it can be referred to as the matrix of average expenditure propensities as follows:

$$A = \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix}$$

By using matrix A the following equation (9) can now be expressed which appears analogous to the open Leontief model. Actually, the basic difference is that the SAM is closed with respect to how income distribution is determined by factors as well as institutions and the consumption behaviour of institutions[57] (Defourny and Thorbecke, 1984).

$$Y = AY + X \quad \text{..... (9)}$$

or

$$\begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix} + \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix}$$

where Y = vector of total income of endogenous accounts,
X = vector of exogenous injections,
and A as defined above.

From the equation 9, furthermore, the matrix of accounting multiplier (M_a) can be obtained as follows:

$$Y = (I - A)^{-1} X = M_a X \quad \text{..... (10)}$$

where M_a = the matrix of accounting multiplier,
I = identity matrix,
and all other matrices and vectors as defined above.

---

56) For a detailed information of direct influences, indirect influences and global influences discussed in the Structural Path Analysis and Multiplier Decomposition within a SAM framework refer to Defourny and Thorbecke (1984). In this study, the values of average expenditure propensities (AEP) are to be a calculation base of direct effects. Afterward, to capture direct accounting multipliers effect of each institution presented in subsections 5.2.1 and 5.2.3, this study multiplies the values of each cell of submatrix T_{13} and T_{21} according to economic sectors (see Table 4.1 in chapter 4 above). The results of this total multiplication of all economic sectors constitute the direct accounting multipliers effect utilized in the analysis of this study.

57) Solving the production activities vector (Y_3) based on a SAM system yields $Y_3=A_{33}Y_3+(A_{32}Y_2+X_3)=(I-A_{33})^{-1}.f$, where A_{33} is the input-output coefficient matrix and f is exogenous final demand. It is a higher degree of endogeneity since it captures the effects of income distribution (Y_2) on household consumption of each group (A_{32}). In contrast, the Leontief formulation can not reflect this relation, Defourny and Thorbecke (1984).

Equation 10 obviously illustrates the impact of a policy (exogenous accounts) on the endogenous sectors in the economy (the whole SAM system) including the impact of a policy on generating income of society (endogenous accounts consist of production activities, factors and institutions) which increases the amount of M_a. Matrix M_a can be therefore be called the matrix of global influences. Hence, this empirical study employs the SAM-based model postulated by Defourny and Thorbecke (1984). Moreover, the matrix of accounting multiplier (M_a) can be partitioned into three submatrices either by using Pyatt and Round's decomposition process through the multiplicative method or by using Stone's decomposition process[58] which relies on the additive method. In this way, the accounting multiplier effect of M_a is decomposed into the transfer effects, the open-loop effects (sometimes called cross effects), and the closed-loop effects (also from time to time referred to as circular effects). In this study, the decomposition of the accounting multiplier follows Stone's method. Specifically, decomposing M_a is a necessity if one wants to obtain specific insights in the accounting multiplier process in the economy. It usually is of interest to learn more about the influence of implementing changes in economic policies (in exogenous accounts) on the various (endogenous) accounts and thereby get an overview of the total impact on the economy. A decomposition of the accounting multiplier matrix (M_a) into four additive components can be provided as shown in equation 11 consisting of the initial injection; transfer effects; open-loop effects; and closed-loop effects, as follows:

$$M_a = I + (M_{a1} - I) + (M_{a2} - I)M_{a1} + (M_{a3} - I)M_{a2}M_{a1} \quad (11)$$
$$= I + T + OL + CL$$

where: I = the initial injection (I),
M_{a1}-I = the net contribution of transfer effects (T)[59],
(M_{a2}-I) M_{a1} = the net contribution of open-loop or cross effects (OL),
(M_{a3}-I) $M_{a2}M_{a1}$ = the net contribution of closed-loop or circular effects (CL).

58) The precise explanation of model derivation is discussed by Stone in his writing with regards to the disaggregation of the households sector in the national accounts in Social Accounting Matrices: A Basis for Planning edited by Pyatt and Round (1985), A World Bank Symposium.

59) Pyatt and Round (1979) explained evidently that M_{a1} and M_{a3} are block diagonal matrices. As a result, all effects between partitions of the total income of endogenous accounts (Y) must be captured by M_{a2}. This matrix is therefore referred to as the cross-effects matrix or alternatively as the open-loop effects.

Note:

$$M_{a1} = \begin{pmatrix} I & 0 & 0 \\ 0 & (I-A_{22})^{-1} & 0 \\ 0 & 0 & (I-A_{33})^{-1} \end{pmatrix}$$

$$M_{a2} = \begin{pmatrix} [\, I - A_{13}(I - A_{33})^{-1} A_{32}(I - A_{22})^{-1}A_{21}]^{-1} & 0 & 0 \\ 0 & [\, I - (I - A_{22})^{-1} A_{21}A_{13}(I - A_{33})^{-1}A_{32}]^{-1} & 0 \\ 0 & 0 & [\, I - (I - A_{33})^{-1} A_{32}(I - A_{22})^{-1}A_{21}A_{13}]^{-1} \end{pmatrix}$$

$$M_{a3} = \begin{pmatrix} I & A_{13}(I - A_{33})^{-1}A_{32} & A_{13} \\ (I - A_{22})^{-1}A_{21} & I & (I - A_{22})^{-1}A_{21}A_{13} \\ (I - A_{33})^{-1} A_{32}(I - A_{22})^{-1}A_{21} & (I-A_{33})^{-1}A_{32} & I \end{pmatrix}$$

This decomposition represents the three most important components of the global effects (the matrix of global influences). The transfer effects are direct transfers within endogenous accounts (in our particular case among institutions (A_{22}) and the inter-industry transfers (A_{33})). The open-loop or cross effects capture the interactions among and between the three endogenous accounts, while the closed-loop or circular effects ensure that the circular flow of income is completed among endogenous accounts, i.e. from production activities to factors to institutions and back to activities in the form of consumption demand following the triangular pattern presented in Figure 4.1 as presented above. In other words, this decomposition noticeably portrays the whole configuration of global effects on the economy by elaborating the specific pattern of effects consisting of transfer effects, open-loop effects, and closed-loop effects[60].

In addition, to capture direct, indirect, and global accounting multipliers effect on income distribution across institutions due to the increase in oil prices, this study uses the concept of structural path analysis[61]. Direct accounting multipliers effect can be directly presented by the element of the matrix of average expenditure propensities A_n (AEP) which can be measured

60) The accounting multiplier decomposition i.e. transfer effects, open-loop effects, and closed-loop effects in this study reveals only to a very limited extent how influence is transmitted within a structure. See Defourny and Thorbecke (1984) who discussed structural path analysis and multiplier decomposition comprehensively.

61) In this study the effects will be concentrated more on only one specific structural effect i.e. from the economic sectors through the factor income to each institution.

using the equation 8. Additionally, multiplying the values of direct accounting multipliers with the path multiplier $M_{p,}$ the indirect accounting multipliers effect (total influences) can be captured. The path multiplier is equal to the ratio of two determinants $\Delta p / \Delta$ where Δ is the determinant $\left|I - A_n\right|$ of the structure represented by the SAM and Δp is the determinant of the structural path excluding the poles constituting path p. Then, the global accounting multipliers effect is represented by the element of the matrix accounting multiplier which is called the matrix of global influences (see the equation 10). Implicitly, the global accounting multipliers effect includes the direct and indirect accounting multipliers effect[62]. These are analyzed widely in the next section 5.2.

By using SAM framework as an analyzing tool, it is possible to calculate the accounting multiplier and to decompose them for describing the various changes in the economy comprehensively. Hence, this method is capable of demonstrating the influence of policy changes on the economic sectors including on the distribution of income in the economy. The latter is due to measuring impact of changes in economic activities on factor income. Additionally, accounting multiplier decomposition analysis is also necessary in order to provide detailed information about how fluctuations in exogenous conditions originating e.g. from policy changes affect the entire economy. Besides, to provide a deep analysis of the study, it is highly supported by direct, indirect, and global accounting multiplier analyses. Nevertheless, the SAM-based model has some shortcomings. (i) The implicit assumption is made that there is excess capacity in all sectors: i.e. unemployed or underemployed factors of production (i.e. availability of unused resources)[63]. It means that the accounting multiplier is calculated under the equilibrium condition. Consequently, if there are capacity restrictions of any kind, the accounting multipliers will provide the overestimated results pertaining to the

62) Direct accounting multipliers effect constitutes the direct influence of *i* on *j* transmitted through an elementary path that is the change in income (or production) of *j* induced by a unitary change in *i* and the income (or the production) of all other poles except those along the selected elementary path remaining constant. Indirect accounting multipliers effect is the influence transmitted from *i* to *j* along the elementary path *p* including all indirect effects within the structure imputable to that path. And global accounting multipliers effect measures the total effects on income or output of pole *j* consequent to an injection of one unit of output or income in pole *i*(Defourny and Thorbecke (1984).

63) see Defourny and Thorbecke (1984) in the Structural Path Analysis and Multiplier Decomposition within a SAM framework and Pyatt and Round (1979) in Accounting and Fixed Price Multipliers in a Social Accounting Matrix Framework.

total effects as well as the final distributional effects will be uncertain. (ii) Prices are fixed in the analysis which indicates that there is no allowance for substitution effects anywhere or at any stage (a snapshot for a particular year). This case may also generate an overestimation of the total reaction. Hence, it is an appropriate approach for short term analysis. (iii) The technology is held unchanged (Leontief technology) which denotes as a deterministic model due to constant technology. Given these limitations, it is necessary for the current study to employ a CGE-based model which is also strengthened by some simulations in exploring more comprehensively the issues pertaining to the impact of oil prices increases on the poor as well as the vulnerability of households to poverty in Nanggroe Aceh Darussalam.

4.2.3 Computable General Equilibrium (CGE) model

The milestone of the general equilibrium theory was instigated firstly by Francois Quesnay's (1694-1774) circular flow model of an economy and the income circle in his notable book "Le Tableau Economique[64]" in which agricultural sector plays a big role as a leading sector in the economy (Physiocrats). Then, this framework turned out to be as a foundation of thought for the other classical economists in particular Adam Smith (1723-1790) presented in his outstanding book "An Inquiry into the Nature and Causes of the Wealth of Nations" by means of the price mechanism in the function of the invisible hand which an auctioneer defines the equilibrium price. Moreover, the French economist Marie Esprit Leon Walras (1834-1910) developed a theory of general equilibrium presented in his remarkable book "Elements of Pure Economics (1874-1877)" in which all the markets of an economy which are consisted by all supplies and demands, prices and outputs of goods and factors are determined simultaneously by theoretical foundation and mathematical proof. It means that the economic system is made up of households and firms. Each household owns a set of resources, commodities useful in production and consumption, including different kinds of labour. His model was accomplished by means of assuming that market clearing was identical with the

64) Quesnay analyzed the circulation of wealth in the economy by setting out the different classes of society. The table showed how the 'produit net' produced by the agricultural sector circulated between the owners of the land, the tenant farmers, and other classes such as artisans and merchants. Only agricultural produced any net additions to wealth (surplus value); all other activities were 'sterile' (essential classes in creating the necessary demand for the agricultural sector, Bannock, Baxter, and Davis (1999).

market equilibrium, perfect competition, the quantities of inputs and outputs and their prices all automatically adjust to their equilibrium values before any trades actually take place. Now, it is renowned by the model of general equilibrium. The system of simultaneous equations in which one price vector brings demand and supply into equilibrium and which allows determining the equilibrium quantity[65]. To prove this general equilibrium condition, adding together all of the consumers' demand functions give the aggregate consumer demand function $X(p) = \sum_{i=1}^{n} x_i(p)$ where x_i and p refer to commodities and vector of prices respectively, the aggregate supply vector comes from adding together the aggregate supply from consumers denoted by $\omega = \sum_{i=1}^{n} \omega_i$ where ω_i refers to endowment, and the aggregate net supply of firms $Y(p)$ which represents production plan. In conclusion, the aggregate excess demand functions by $z(p) = X(p) - Y(p) - \omega$. A component of $z(p)$ is negative if the relevant commodity is in net excess supply and positive if the commodity is in net excess demand (Varian, 1992). If $z(p)$ is as defined above, then $pz(p) = 0$ for all p. Furthermore, Walras' law can be illustrated as follows:

$$\begin{aligned} pz(p) &= p\left[X(p) - Y(p) - \omega\right] \\ &= p\left[\sum_{i=1}^{n} x_i(p) - \sum_{j=1}^{m} y_j(p) - \sum_{i=1}^{n} \omega_i\right] \\ &= \sum_{i=1}^{n} px_i(p) - \sum_{j=1}^{m} py_j(p) - \sum_{i=1}^{n} p\omega_i \end{aligned}$$

The budget constraint of the consumer is $px_i = p\omega_i + \sum_{j=1}^{m} T_{ij} py_j(p)$. Then, a general equilibrium condition can be reached by making this replacement as follows:

$$\begin{aligned} pz(p) &= \sum_{i=1}^{n} p\omega_i + \sum_{i=1}^{n} \sum_{j=1}^{m} T_{ij} py_j(p) - \sum_{j=1}^{m} py_j(p) - \sum_{i=1}^{n} p\omega_i \\ &= \sum_{j=1}^{m} py_j(p) \sum_{i=1}^{n} T_{ij} - \sum_{j=1}^{m} py_i(p) \\ &= \sum_{j=1}^{m} py_j(p) \sum_{j=1}^{m} py_j(p) = 0, \ \text{since} \sum_{i=1}^{n} T_{ij} = 1 \text{ for each } j. \end{aligned}$$

65) The comprehensive discussion on the line of theoretical framework of general equilibrium is elaborated obviously in a history of economics theory and method published by Ekelund JR. and Hebert (1997).

Furthermore, Vilfredo Pareto (1848-1923) was an early adherent of Walrasian general equilibrium, and he utilized that framework to explore and establish several areas of economic analysis, including a brilliant contribution to methodology. In his "Cours d'economie politique (1896-1897)" and "Manuel d'economie politique (1906)", Pareto explored the conditions in exchange and production using Edgeworth's box that is the foundations of modern welfare economics rooted in Walrasian general equilibrium. Even though, Pareto did not derive all the conditions for a global welfare maximum, (Ekelund JR. and Hebert (1997)).

Therefore, the CGE model is as a basic and comprehensive framework for economic analysis since it has capability in examining broad spectrum problems (the consequential effect of macro and microeconomic policies), such as the impact of the oil prices increases on the poor and the vulnerable household to poverty in company with determining the premeditated Aceh government policies in the future. Its competency can be identified by providing an across-the-board analysis of the impact of changes on, in particular scenarios of, implementation of the government policy or other external shocks. It means that the CGE-based model is a proficient method to weigh up the effect of shock on the topic of policy variables, namely tariffs, quantitative restrictions, and indirect taxes on trade flows, prices, employment, industrial structure, and economic welfare.

The output of the application of the CGE-based model can be used to identify how much gain and how much pain an economy sustains as a result of the change of the government's policy or implementation of new course of actions. The trade-off arising from a policy change or implementation of new strategies can also be identified by the CGE model. Lewis (1991) allowed looking at the CGE model as a non-linear simulations equations model which accommodates price and quantity variables adjustment as factor input market equalizer or commodity market equalizer in different economic simulations. So, the CGE model simulates the optimal condition of consumers and producers in an economy. In addition, it also enables to show the government role as economic actor. Generally, this model has strong-enough ability in figuring out the all transactions in money cycle, commodity cycle and services cycle in economic mechanism. Furthermore, Lofgren, et al (2000) and Robinson and Roland-Holst

(1988) also underlined that the CGE model is a set of simultaneous equations of which many may be nonlinear (i.e. production and consumption) representing the behaviour of the different actors in the economic system. In constructing the CGE model, one follows the SAM disaggregation of factors, activities, commodities, and institutions. The CGE model is as an integrated approach which enables to generate comprehensive simulations with respect to macroeconomic as well as microeconomic policies. This study utilizes this type of model as a commanding instrument in assessing the impact of oil price changes on the poor in Aceh.

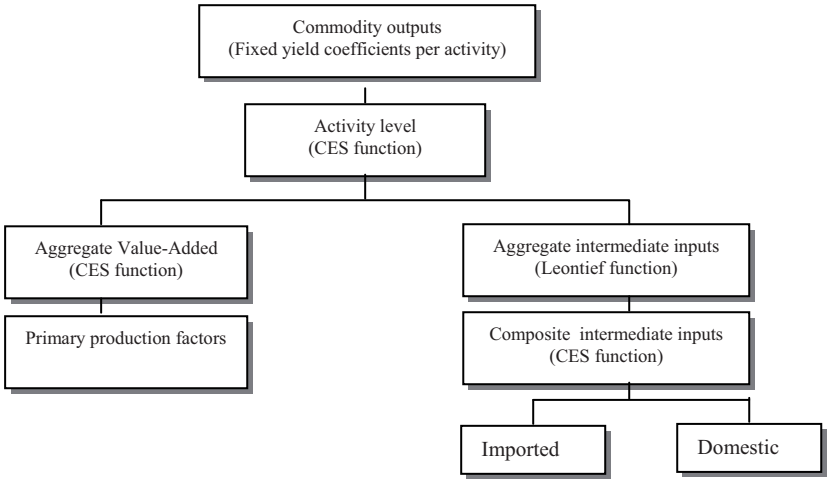
This empirical study employs the standard CGE model from IFPRI as developed by Lofgren, et al (2000). The basic characteristics of the structure of this model as used in this study can be classified into four blocks such as; first, activities, production, and factor market; second, institutions; third, commodity markets; and fourth, macro-economic constraints. They are discussed in the following subsections. The structures of mathematical equations are provided in Appendix 1.

4.2.3.1 *Activities, Production, and Factor Market*

Principally, each producer is assumed to always generate maximizing profits as defined by the difference between revenue earned and the cost of factors and intermediate inputs employed in the production process. The maximum of profits depends on the prevailing production technology which is specified in the current version of the model by nested functions. The activity level of production is assumed to be a constant elasticity of substitution (CES) function with aggregate value-added and aggregate intermediate inputs as its arguments. The quantity of aggregate value-added is also determined assuming a CES technology exists. The arguments of this function are the three production factors referred to above. Given the functional form used for this aggregation the hypothesis is made that each pair of the three production factors has the same rate of substation. On the other hand, a Leontief technology reflects the way how the various composite intermediate inputs are aggregated. Each of these inputs may have been produced either within the region of Aceh (domestically) or outside of it (abroad). It is postulated that they are imperfect substitutes. Whether they are brought from the market inside the region (domestic market) or outside the region (foreign market) depends

on the relative prices prevailing in these markets. Producers' maximization behaviour in the CGE model constitutes an essential part of determining the production processes taking into account the relationships between labour and capital and the markets of intermediate inputs. The marginal revenue product of each production factor and intermediate input is equal to its price. Likewise, the marginal costs of the commodities produced match their corresponding prices obtained in the markets. The structure and behaviour of the production technology is demonstrated noticeably in Figure 4.2 as follows:

Figure 4.2 Production Technology



Note : CES refers to Constant Elasticity of Substitution
Source: adapted from Lofgren et al, 2002.

4.2.3.2 *Institutions*

In the CGE model, institutions are classified into four categories namely households, enterprises, the government, and the −'rest of the world'− as specified consistent with SAM data. Households are assumed to maximize utility and thus choose their levels of consumption based on their preferences, income and the relative prices. As discussed previously concerning the schematic SAM table depicts a closely relationships among institutions in the economic activities. Households receive income from the factors of production from enterprises directly or indirectly as using the factors in production activities and transfer from other institutions. Thus, households spend their income particularly for consuming, paying direct taxes, saving, and making transfers to other institutions. Enterprises will receive income

directly or indirectly from households as well as transfers from other institutions. The direct way of receiving revenues from households is by selling the produced commodities at market prices to them that includes taxes and transaction costs. Indirectly, companies get receipts from households by self-consuming these own-produced commodities. In this case, they are valued at activity-specific producer prices. Firms spent their incomes for paying direct taxes, for savings, and for paying to other institutions; i.e. for purchasing intermediate inputs and for remunerating the use of production factors. The following equations illustrate these relations for private households and enterprises as just discussed. The leading sources of household income and expenditure which will be utilized as an important concentration of this study concerning household income distribution perspective as follows:

$$YH_h = \sum_{f \in F} YHF_{hf} + \sum_{h` \in INSDNG`} TRII_{hi`} + trnsfr_{hgov} . \overline{CPI} + trnsfr_{hrow} \ . \ EXR \ , \text{ all h Є INSDNG...(12)}$$

where YH_h = total income of household h,
YHF_{hf} = income of household h received from factor f,
$TRII_{hi`}$ = transfers from institution i` to household h,
$Trnsfr_{hgov}$ = transfers from the government to household h,
$\overline{CPI}$ = consumer price index,
$Trnsfr_{hrow}$ = transfers from the rest of the world to household h,
EXR = exchange rate,
h = index running over all households,
F = index set for production factors,
$INSDNG$ = index set for households,

$$EH_h = \left(1 - \sum_{i \in INSDNG} shii_{ih} \right) . (1 - MPS_h) . (1 - TINS_h) . YH_h \text{, all h Є INSDNG……(13)}$$

where EH_h = consumption expenditures of household h,
$shii_{ih}$ = share of net income of household h,
MPS_h = marginal propensity to save of household h,
$TINS_h$ = direct (income) tax rate of household h,
YH_h = total income of household h,
h = index over all households,
all other variables and index sets as defined above.

A more elaborate explanation and mathematical description of each variable determining income and expenditure of households is provided in Appendix 1. Furthermore, Government's income consists of taxes collected and money transfers from households and enterprises. It spends these receipts to purchase commodities for its consumption and for

making transfers to other institutions. Finally, transfer payments between the rest of the world and domestic institutions and factors are all fixed in foreign currency. Foreign savings (or the current account deficit) constitutes the difference between foreign currency spending and receipts. Some important variables which strappingly influence government revenue and expenditure are represented by the following equations 14 and 15. However, to reach the complexity of variable relationship postulated by means of several leading equations will be precisely provided in Appendix 1.

$$YG = \sum_{i \in INSDNG} TINS_i \, .YH_i + \sum_{f \in F} tf_f \; YF_f \, . + \sum_{a \in A} tva_a \, .PVA_a \, .QVA_a$$
$$+ \sum_{i \in A} ta_a \, .PA_a \, .QA_a + \sum_{c \in CM} tm_c \, .pwm_c \, .QM_c \, .EXR + \sum_{c \in CE} te_c \, .pwe_c \, .QE_c .EXR$$
$$+ \sum_{c \in C} tq_a \, .PQ_c \, .QQ_c + \sum_{f \in F} YHF_{gov\,f} \, . + trnsfr_{gov\,row} \, .EXR \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(14)$$

where YG = government revenue,
$TINS_i$ = rate of direct taxes on domestic institutions i,
YH_i = income of domestic non-government institution i,
tf_f = direct tax rate for factor f,
YF_f = income of factor f,
tva_a = rate of value-added tax for activity a,
PVA_a = price of aggregate production factors used in activity a,
QVA_a = quantity of aggregate production factors used in activity a,
ta_a = rate of taxes of activity a,
PA_a = price of activity a,
QA_a = level of activity a,
tm_c = import tariff rate on commodity c,
pwm_c = import price of commodity c,
QM_c = quantity of imports of commodity c,
te_c = rate of export taxes on commodity c,
pwe_c = export price of commodity c,
QE_c = quantity of exports of commodity c,
tq_a = rate of sales tax of composite commodity c,
PQ_c = price of composite commodity c,
QQ_c = quantity of composite commodity c,
YHF_{govf} = government income for factor f,
$trnsfr_{govrow}$= transfers from the rest of the world to the government,
A = index set of all activities,
C = index set of all composite commodities,
CE = index set of all goods exported,
CM = index set of all goods imported,
all other variables, parameters and index sets as described above

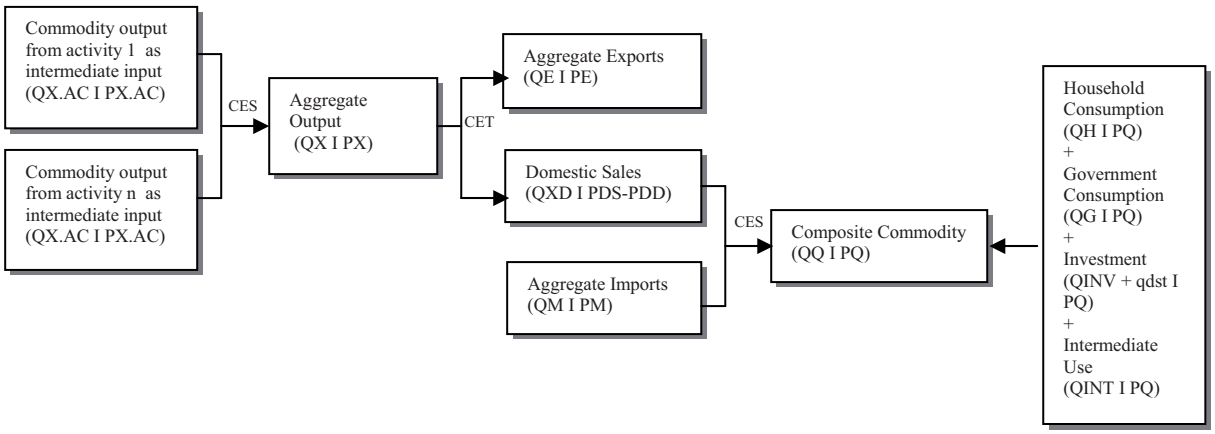
$$EG = \sum_{c \in C} PQ_c \,.QG_c \,.+ \sum_{i \in INSDNG} trnsfr_{igov} \,.\overline{CPI} \quad \text{..... (15)}$$

where EG = government expenditure,
PQ_a = composite commodity price,
QG_c = government consumption of composite commodity c,
$trnsfr_{gov}$ = transfer to domestic non-government institutions,
$\overline{\text{CPI}}$ = consumer price index,
all other variables, parameters and index sets as described above

4.2.3.3 *Commodity Markets*

At domestic production, the various activity levels produce the commodities. An activity may have joint production, i.e. more than one good may be produced simultaneously. The production technology is described in subsection 4.2.3.1 above. The commodities produced are composites in the sense that they are either exported or used domestically. Both types are considered to be imperfect substitutes and the composite output is decomposed employing a Constant Elasticity Transformation (CET) function following the maximization of sales revenues. The CET function depicts imperfect transformability between exports and domestic sales. Export demands are assumed to be infinitely elastic at given world prices including transaction cost and export tax. The price for domestically used outputs is equal to that paid by domestic consumers less than transaction cost.

Figure 4.3 Flows of Marketed Commodities



Note : CES stands for Constant Elasticity of Substitution
CET stands for Constant Elasticity of Transformation
Source: adapted from Lofgren et al. 2002.

The goods demanded by households and the government for final consumption, investment, and an intermediate input are also a composite of domestic output and imports. Composing these aggregate commodities follows the principle of cost minimization. The imperfect substitutability between domestic sales and aggregate imports is captured by a CES aggregator. Like the demand of exports from the Aceh region, the supply of imports into this area is assumed to be infinitely elastic at given world prices including import tariff and cost of transaction services that will be paid by domestic users. A completed description of the physical flows for all marked commodities is shown in the Figure 4.3 together with the associated quantity and price variables defined in the CGE model.

In the standard CGE model implemented in this study, the value of trade elasticity for the Armington functions as well as substitution elasticity for the sectoral CES production functions are supported from previous studies about the Indonesian economy such as Wuryanto (1996). These as necessary the data available are insufficient for providing a meaningful estimation of these parameters. Wuryanto (1996) also compiled this information from various publications which concerned the similar works for the Indonesian economy as well as interregional economy such as Thorbecke (1992) and Lewis (1991) at national level as well as Temenggung (1995) at regional levels. This approach is reasonable because Wuryanto classified the regions into two observed areas such as Java comprised Western Java, Central Java, and Eastern Java as well as outside Java according to the five biggest Indonesian islands consisted of Sumatera, Kalimantan, Sulawesi, and Eastern islands. It is important to keep in mind that Aceh is a part of Sumatera Island. So, it makes a strong argument to use in this analysis the figures published by Wuryanto. Given due considerations some adjustments of the parameters of both the CET functions and the CES functions were made since the investigation is done for Aceh.

4.2.3.4 *Default Macro-Economic Closures*

The last structural block of the standard CGE model employed in this study concerns the macroeconomic constraints (or closures). It consists of three macroeconomic balances. These are the current government budget, the external balance of the region; i.e. the current account

of the balance of payments including the balance of trade in goods and services and the savings-investment balance (Lofgren, et al, 2002). A set of alternative macro economic constraints is proposed in Table 4.2. Actually, government savings constitutes the difference between current government revenues and current government expenditures indicating a flexible residual while all direct tax rates are fixed (GOV-1 of this table). Moreover, GOV-2 and GOV-3 show that fixed government savings together with dissimilar changes in the receipts of direct taxes such as for selected institutions by equal percentage point change and for all institutions by changing all tax rates proportionally. It is important to recognize that government consumption is fixed in all of these three constraints. In the context of the current account balance, there are two alternatives closure rules presented by the standard CGE model of IFPRI; fixed foreign savings while real exchange rate is flexible (ROW-1) and real exchange rate is fixed while foreign savings is flexible (ROW-2).

Table 4.2 Alternative Closure Rules for Three Macroeconomic Balances

Balance of government budget	Balance of current account with Rest of the World	Savings-investment balances
GOV-1 Flexible government savings; fixed direct rates **GOV-2** Fixed government savings; uniform direct tax rate point change for selected institutions **GOV-3** Fixed government savings; scaled direct tax rates for selected institutions	**ROW-1** Fixed foreign savings; flexible real exchange rate **ROW-2** Flexible foreign savings; fixed real exchange rate	**SI-1** Fixed capital formation; uniform MPS point change for selected institutions **SI-2** Fixed capital formation; scaled MPS for selected institutions **SI-3** Flexible capital formation; fixed MPS for all non-government institutions **SI-4** Fixed investment and government consumption absorption shares (flexible quantities); uniform MPS point change for selected institutions **SI-5** Fixed investment and government consumption absorption shares (flexible quantities); scaled MPS for selected institutions

Note: (1) For the specified closure rules, the choice for one of the three constraints does not constrain the choice for the other two constraints.
(2) MPS stands for Marginal Propensity to Save
Source: Lofgren et al, 2002

In the following discussion of macro closure rules for the savings-investment balance two categories are considered, investment-driven and savings-driven. According to Table 4.2, SI-1 and SI-2 are investment-driven because capital transformation is pre-determined at a fixed

level so that the MPS has to adjust for selected institutions with the purpose of meeting the requirements for total savings (the value of savings adjusts). This is different for the savings-driven closure rule as presented by SI-3. This assumes total savings are predetermined by the MPS and total capital formation has to adjust to be in line with savings. Moreover, closure rules SI-4 and SI-5 are in a sense also investment-driven. In these rules the share of the total absorption capacity of the economy is held constant. The savings are adjusted accordingly through the MPS.

In an attempt to decide which closure rule to apply in this study, it is useful to take a look at the background of economic development in the Aceh region during the time period of this analysis, i.e. the years 2002 and 2005. As a first consideration, this study will simply analyze the regional economy of the Nanggroe Aceh Darussalam Province. Secondly, during these two years, Aceh implemented a new framework of political economy with regard to regional autonomy by setting general regulations as well as special ones for Aceh (the Law No. 22/1999 and the Law No. 18/2001 replaced by the Law No 11/2006). This began in 2002. There are some important points in which the local governments were provided more sovereignty in managing their local political economy in each region excluding foreign politic affairs, national defence and security, justice, as well as monetary and fiscal policies. Apart from these issues, the appropriate macro closures implemented in this study are: the closure GOV-1 (flexible government savings and fixed direct taxes), the closure ROW-1 (fixed foreign savings and flexible real exchange rate), and the closure SI-1 (fixed capital formation and uniform adjustments in the MPS for specific institutions). Lofgren et al (2001) underlined that if a single-period model is employed as done in this study, a closure combining fixed foreign savings, fixed real investment, as well as fixed real government consumption is preferable for conducting simulations to look into the equilibrium welfare changes due to some government policies or avoiding potentially misleading welfare effects due to changes in foreign savings and real investment demand.

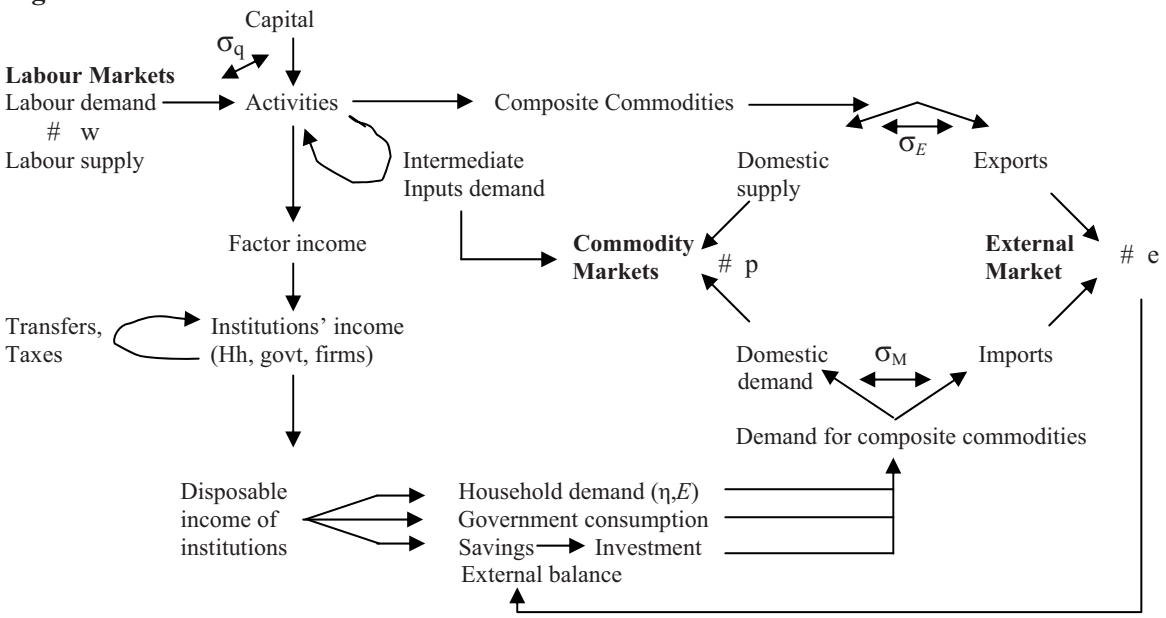
The assumptions made with regard to macroeconomic closures are crucial for the current analysis because they influence the outcomes of the simulations. This study focuses on

investigating the impact of increases in oil prices such as for gasoline, diesel, and kerosene on the poor. The main questions are how strong the oil prices increases are on the poor as indicated by the distribution of household income in Aceh (e.g. the changes of household income, household expenditure, and saving) and the changes of the other variables in the model such as factor market equilibrium, the economy-wide remunerations of factors, government income, government expenditure, and government saving. In addition, the other supplementary simulations presented in this study are aimed to capture the importance of government transfers to the poorest and the poor households for mitigating the impacts of oil prices increases. Furthermore, it stressed that oil price changes in this analysis are merely imposed on domestic fuels (gasoline, diesel, and kerosene). This consideration is caused by the focusing the analysis of this study at regional level, one of Indonesia's provinces that is Nanggroe Aceh Darussalam Province. As a result of the regional perspective, there is a qualification of this study that can not capture the consequences of the world prices fluctuation together with reducing oil subsidies carried out by the Indonesian government.

4.2.3.5 *Flow Chart of the CGE Model*

To provide a better overview of the information flow in the CGE model applied Figure 4.4 shows the main blocks of this tool and their interdependencies. A full presentation of all equations of the model is given in Appendix 1. As depicted by this figure the main four blocks are: (i) the activity level, commodity output, and factor market; (ii) the institutions; (iii) the commodity market; and (iv) the macroeconomic balances. The arrows show the flow on physical items such as commodities, factors and activities or on monetary transfers such as incomes, expenditure, taxes and income transfers. It is important to keep in mind that the figure does not depict the policy settings by the government. The local government of the region Aceh is assumed to formulate and implement some appropriate macroeconomic policies which are conform with its long-term policy strategies; for instance by coping with the poor as well as the vulnerability of households to poverty by managing risks both risk mitigation (ex-ante) and risk coping (ex-post) in Aceh.

Figure 4.4 Global Flow of CGE Model



Note : - The symbol # w, # p, and # e represents a market mechanism with equilibrium price p, wage w, and exchange rate e
- σ_q refers to elasticities of substitution between factors of production
- σ_M refers to elasticities of substitution between imports and domestic goods
- σ_E refers to elasticities of transformation between exports and domestic goods
- η and *E* refers to the income and price elasticities of household consumption

Source: adapted from Sadoulet and Janvry, 1995

4.2.3.6 *Simulations*

There is a strong change in the government's view with regard to increasing prices of oil since the economic crisis in 1997. Prior to that year, all types of oil in Indonesia were heavily subsidized in order to make domestic use of energy cheaper. Later on, subsidies on fuels were intended to help certain income classes, especially the poor households. This policy was also justified by arguing that subsidized oil prices have also a dampening impact on the inflation rate. But, after the economic crisis in 1997, the government started to reduce subsidies on oil accepting in a sense the upward push of the inflation rate. This policy was mainly triggered by need to keep government spending under control. As a consequence of oil prices increased substantially. On the other hand, the Indonesian government puts more funds into special programs, such as the Compensation Program for Reduced Subsidies on Refined Fuel Oil or PKPS-BBM, used for financial assistance to certain households who are completely affected by the oil prices escalation. These are especially the poorest and poor households. This program is financed exclusively from the National Income and Expenditure Budget (APBN). The national government transfers the money to the local governments which implement the

program. The later, however, bear all additional costs of implementing the PKPS-BBM program, such as technical assistances and administration. In 2005, the total funds available in the PKPS-BBM program reached 13.487 trillion Rupiah[66] for all provinces of Indonesia. The eligibility of the provinces for obtaining this kind of support depends on their social and economic structure; i.e. on the number, size and income level of those households which may submit claims for these income transfers.

In achieving the main purposes of the study pertaining to the impact analysis of the increase in oil prices on the poor in Nanggroe Aceh Darussalam Province, several scenarios are implemented. In the first scenario, an increase in gasoline and diesel prices of 32.6 percent and 27.3 percent, respectively are assumed. This reflects the price changes of these two fuel types as occurred in March of 2005. The second scenario investigates another oil price rise which took place later, in October 2005. This included the price of kerosene as well. It amounted to 87.5 percent, 104.8 percent, and 185.7 percent for gasoline, diesel, and kerosene, respectively. It is more realistic to combine these two price changes and investigate their effects. This was done in scenario 3. The oil prices increases of gasoline, diesel, and kerosene are for this scenario 148.6 percent, 160.6 percent, and 185.7 percent, respectively. In May 2008 another upward move in oil prices took place. Then the gasoline price rose by 231.49 percent, that of diesel by 233.3 percent, and that of kerosene by 257.1 percent. This was utilized as scenario 4. These four scenarios do not account for the PKPS-BBM program. They only analyze the impact of price changes. In general, it is expected that these scenarios of the oil prices increases would lower real income of households and at the same time reduce household consumption to a certain extent. These changes in real income and consumption will have an effect on savings of households as well. The PKPS-BBM program is included in additional scenarios. Scenarios 5 to 7 include the varied government transfers of this program to the poorest and poor households, both in rural and in urban regions. Scenarios 5 and 6 take the price changes of scenario 3 and assume that a 50 and 100 percent income transfers are made. The basis for this transfer is Aceh's share in the national spending of this program,

66) This constitutes the total realization of the PKPS-BBM for the year 2005 according to the Indonesian Financial Department.

particularly cash transfer payment, which was approximately 140 billion Rupiah[67]. The seventh scenario takes a 100 percent of Aceh's share in the national spending of the PKPS-BBM program to the poorest and the poor and assumes oil prices changes as in scenario 4. It is expected that the three last scenarios will shed light on the impact of government transfers such as the PKPS-BBM program in improving the real income situation of households with subsequent rise in the purchasing power of households as indicated by the household consumption expenditures at the same time. Moreover, an increasing real income of households will also significantly influence the saving pattern of households.

Table 4.3 Design of Scenarios Relating to the Oil Price Changes (in percentage)

Scenarios	SAM data used of year	Gasoline	Diesel	Kerosene	The role of Government Transfer (PKPS-BBM) to the Poor
Base	*2002 & 2005*	-	-	-	-
Scenario 1	*2005*	*32.6*	*27.3*	-	-
Scenario 2	*2005*	*87.5*	*104.8*	*185.7*	-
Scenario 3 (total oil prices increases in 2005)	*2005*	*148.6*	*160.6*	*185.7*	-
Scenario 4 (total oil prices increases in 2008)	*2005*	*231.5*	*233.3*	*257.1*	-
Scenario 5 (total oil prices increases in 2005)	*2005*	*148.6*	*160.6*	*185.7*	*50*
Scenario 6 (total oil prices increases in 2005)	*2005*	*148.6*	*160.6*	*185.7*	*100*
Scenario 7 (total oil prices increases in 2008)	*2005*	*231.5*	*233.3*	*257.1*	*100*

Note: - The poor who received government transfer are merely consisted of the poorest and poor households.
- The government transfer exclusively comes from the National Income and Expenditure Budget (APBN) excluding technical assistances of the implementation programs which constitute the responsibility of the local government.

All these seven scenarios are analyzed by using the SAM data of the year 2005. Furthermore, the only adjustments, particularly for the scenarios 3-7, are made with regard to the substitution elasticities in the CES functions for combining imports and domestically produced goods as well as the transformation elasticities in the CET functions splitting each composite output commodity into domestic use and export. These elasticities were changed in a way to make the substitution and the transformation more elastic in order to capture a realistic impact of oil prices increases on economic situation of Aceh. The next Table 4.3 summarizes for each scenario the oil prices increases and the income transfers made to the poorest and poor households in Aceh.

67) The "PAGU" of cash transfer payment for 33 provinces in Indonesia for the year 2005, particularly for 15,4 million households with the amount of 100 thousand Rupiah (roughly US$10; if US$1 is equal to 9,926 Rupiah) per household per month, is 4,620 billion Rupiah based on the Indonesian Financial Department.

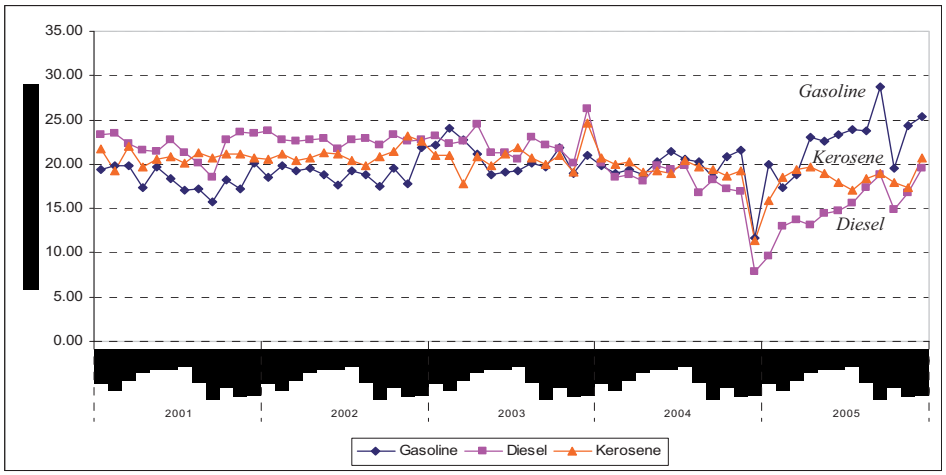
5. RESULTS AND DISCUSSIONS

5.1 Descriptive Analysis of the Data Collected

5.1.1 Distribution Review of Oil Stock by Users

The world oil prices increases have induced the Indonesian government to transform domestic oil prices to a higher level, which seriously started at the beginning of 1999. This action has also stirred up a significant reaction on the discrepancy of domestic oil stock distribution, predominantly three fuel types such as gasoline, diesel, and kerosene. Increasing domestic oil prices determined by the Indonesian government is still not equal enough to the increasing world oil prices. Therefore, the government formulates several adjustments on domestic oil stock as another option. This is conducted to keep away from government expenditure increase on oil. However, the transformation of oil stock adjustments generates variation of domestic oil stock distributions, which creates a disparity of oil supply in some regions in Indonesia. Sometimes, one region gets enough oil supply for a given period but at the other times it faces scarcity of oil stock. The following Figure 5.1 underlines overtly that for the duration of the year 2001-2002 the oil stock in Aceh was moderately stable even though in September 2001 it experienced diminutive reduction, especially diesel and gasoline. However, in January 2003, gasoline stocks tended to boost up. On the contrary, kerosene stock experienced a drop in March 2003 on account of the modification of the government policy on kerosene prices, which started in January 2003. In December 2003, diesel and kerosene stock increased again and then oil stock had been stable until November 2004.

Figure 5.1 Fluctuations of Oil Stock in Aceh, 2001-2005 (in percentage)



Source: Own presentation based on PERTAMINA data (State-owned Oil Company of Indonesia) collected from several branches establishment of PERTAMINA in Aceh, 2001-2005

At the end of the year 2004, the oil stock in Aceh drastically declined owing to the injurious earthquake and tsunami on December 26th, 2004. Nevertheless, declining oil stock did not take along time. In February 2005, the oil stock experienced a normal condition, resembling the previous situation. The normal condition was followed by increasing oil supply until the end of the year 2005. The increase in oil stock was aimed to fulfil needs of the rehabilitation and reconstruction process in Aceh after the tsunami catastrophe. However, in March and October, Aceh faced an extreme decline of oil stock. This was caused by the world oil price shocks and induced the governments to implement domestic oil price increases as a result of an oil subsidy reduction policy. The Indonesian government, therefore, realized to reformulate some adjustments taking into consideration on oil stock for Aceh. But, this situation occurred at a moment in time and the shortage of oil stock in Aceh tended to decrease normally.

In general, the main customers of the oil could be classified into 4 groups. The first is the general public group (GPG) who purchase gasoline and diesel at the SPBU (General Oil Filling Station, mostly them belong to private company), and kerosene at the PMT (Private Kerosene Company)[68]. The general public group: the government; small-medium industries or home industries; and higher, middle, and lower income-level households. The second group is high-scale industries that receive a given quota of oil stock from the government. Usually, the oil prices for these industries are higher than the oil prices for the general public group. Then, the third group is the PLN (State-owned Electricity Company) which obtains a definite allocation of the oil stock from the government. And finally, the last group is the ABRI (National Army), which also takes the delivery of certain proportion of oil supply from the government. The important thing to be kept in mind that the SPBU and the PMT have a function in distributing gasoline, diesel, and kerosene for fulfilling oil demand to the general public group. However, the general public group, high-scale industries, the ABRI, and the PLN are final consumers of three types of fuel oil such as gasoline, diesel, and kerosene as discussed in this study. In most cases, year by year since 2001-2005, the oil consumption based on each user in Aceh was not highly fluctuated as indicated by the following Table 5.1.

68) SPBU and PMT are controlled by PERTAMINA. They have to sell the oils consistent with the government oil price guideline.

Table 5.1 Oil Consumption Based on Users in Aceh, 2001-2005

Year	Description		Gasoline			Diesel				Kerosene	
			GPG	HSI	ABRI	GPG	PLN	HSI	ABRI	GPG	ABRI
2001	Total	(litre)	136607435	402000	5935950	148130670	90530000	68533343	6739333	168279000	309850
	Monthly average	(litre)	11383953	33500	494663	12344223	7544167	5711112	561611	14023250	25821
	Monthly average	(%)	95.57	0.28	4.15	47.19	28.84	21.83	2.15	99.82	0.18
2002	Total	(litre)	141625548	384000	6484912	136912487	100626000	78843100	7622714	171241000	357500
	Monthly average	(litre)	11802129	32000	540409	11409374	8385500	6570258	635226	14270083	29792
	Monthly average	(%)	95.37	0.26	4.37	42.26	31.06	24.33	2.35	99.79	0.21
2003	Total	(litre)	151267876	338000	9960745	118087367	106469000	74580000	19893580	167881000	459000
	Monthly average	(litre)	12605656	28167	830062	9840614	8872417	6215000	1657798	13990083	38250
	Monthly average	(%)	93.63	0.21	6.17	37.01	33.37	23.38	6.24	99.73	0.27
2004	Total	(litre)	139367160	244000	11308680	96960309	84975000	52609000	17310902	153479600	661250
	Monthly average	(litre)	11613930	20333	942390	8080026	7081250	4384083	1442575	12789967	55104
	Monthly average	(%)	92.35	0.16	7.49	38.50	33.74	20.89	6.87	99.57	0.43
2005	Total	(litre)	168565491	240000	8353120	126001037	60105000	13580390	16163950	148895000	563300
	Monthly average	(litre)	14047124	20000	696093	10500086	5008750	1131699	1346996	12407917	46942
	Monthly average	(%)	95.15	0.14	4.72	58.37	27.85	6.29	7.49	99.62	0.38

Note: GPG (General public group), HIS (High-scale industry), ABRI (National Army), and PLN (State-owned Electricity Company).
Source: Own calculation based on PERTAMINA data (State-owned Oil Company of Indonesia) collected from several branches establishment of PERTAMINA in Aceh, 2001-2005.

Table 5.1 provides the worthy prototype of oil consumption in Aceh anchored in the categorizations of main users in consuming oil for the period of 2001-2005. On average, in 2005, gasoline used by the general public group, high-scale industries, and the national army was around 14,047,124 litre (95.15%), 20,000 litre (0.14%), and 696,093 litre (4.72%) per month, respectively. For diesel, the general public group utilized approximately 10,500,086 litre (58.37%); the PLN spent about 5,008,750 litre (27.85%); and industries used up around 1,131,699 litre (6.29%). In addition, diesel was also used by the national army with an average of 1,346,996 litres (7.49%) per month. For kerosene, the general public group used on average 12,407,917 litre (99.62%), and the national army consumed 46,942 litre (0.38%) monthly. In contrast, high-scale industries did not use kerosene in this case (no information).

This configuration implies that more than 90.00 percent gasoline, 37.00 percent diesel, and 99.50 percent kerosene per month were mostly consumed by the general public group for production process, transportation services activities, and fulfilling daily household

consumption. It means that the general public group was bigger than high-scale industries, ABRI, and the PLN groups. It indicates that if the oil prices increase, it will directly affect the general public group which tightly produce and provide goods and services. They will spontaneously undertake to heighten higher tariffs and prices for their goods and services in order to adjust with the new oil prices increases. As a result, the accumulation of this situation firmly forces the creation of a higher inflation rate which is called spiral inflation. Subsequently, higher inflation rate will trims down real income of households, particularly middle and lower income-level households. To investigate a relationship between the impact of the oil price transformation and the poverty rate together with the vulnerability of households to poverty, it will be discussed qualitatively and quantitatively at separated points in this study. At the beginning of this study, it puts a specific focus on exploring the realistic evidences of the oil prices increases with reference to the characteristics of the oil prices and households in Aceh by using primary data (field-surveyed data).

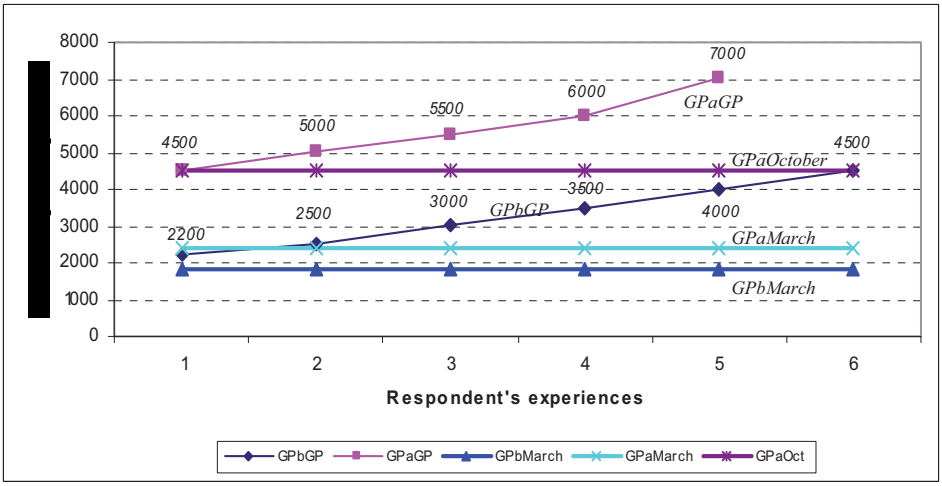
5.1.2 The Characteristics of the Oil Prices

The determination of the oil prices increases is a significant aspect in generating the negative bearing on the socio-economic conditions of society (general public group) in Aceh. Before the government implemented the new gasoline price by 2400 Rupiah per litre in March 2005, it was set at 1810 Rupiah per litre. That gasoline price was retail price at the SPBU. Nonetheless, retail prices provided by the SPBU were lower than retail prices provided by non-SPBU such as agents (oil retailers). As a result of the lack of number of the SPBU in each district, it considerably forced society to purchase gasoline at agents. Therefore, people in rural and urban areas confronted significant variation of retail gasoline prices. According to field study, it varied from 2500 Rupiah per litre until 4500 Rupiah per litre. Low or high variation of gasoline prices was also generated by the distances of areas from the nearest SPBU and the scarcity of oil stock in which more scarce oil stock more expensive prices will be.

Then, the extremely surging gasoline price in October 2005 in the amount of 4500 Rupiah per litre stimulated retail prices in the society from 4500 Rupiah per litre up to 7000 Rupiah per litre. It was paid by 453 respondents of 744 respondents consisting of 164 respondents

(36.2%) who lived in the urban areas and 289 respondents (63.8%) who stayed in rural areas. This situation clarifies that more than 50 percent households of which faced retail gasoline prices above government gasoline prices. Therefore, there is an extreme depiction that the surging gasoline prices in the real world will invigorate almost twice over government prices. This situation thoroughly gave unconstructive side on the whole socio-economic activities of society which highly utilized gasoline in production process and transportation services activities. The illustration of retail gasoline prices derived from the respondent's experiences together with government price of gasoline price is represented by Figure 5.2.

Figure 5.2 Fluctuations of Retail Gasoline Prices (in Rupiah) Based on Field Observation Before and After the Government Declared New Gasoline Price in 2005



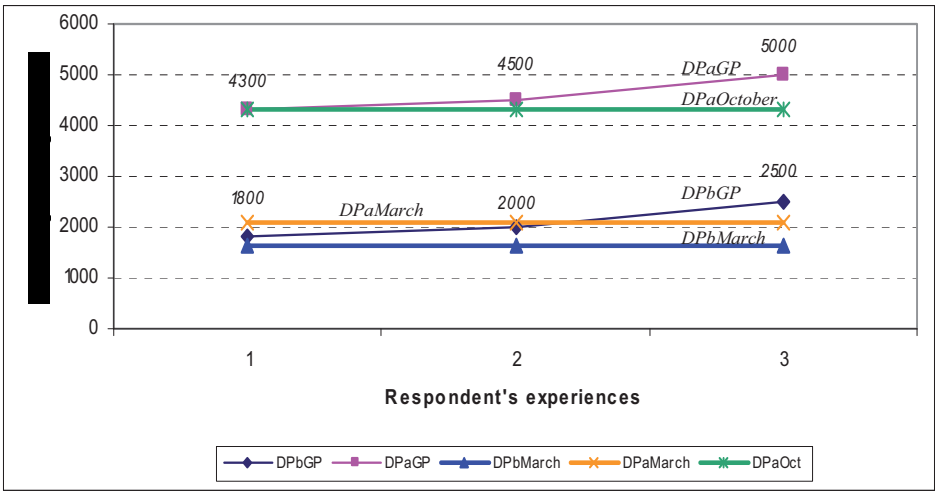
Note:- GPbGP &GPaGP (Gasoline prices before & after government price resolution), GPbMarch & GPaMarch (Government price resolution of gasoline price before & in March 2005), and GPaOct (Government price resolution of gasoline price in October 2005).
- The variation of the oil prices in the Figure 5.2 derived from oil price data surveyed in the society, (no strict scale value of performance in figure).

Source: Own presentation based on data collected in Aceh during the years 2005-2006

On the other hand, retail diesel prices were relatively unwavering conditions as compared to retail gasoline prices. Before the government employed the new diesel price by 2100 Rupiah per litre in March 2005, diesel price was 1650 Rupiah per litre. Nonetheless, retail diesel prices in the field were not extremely different from the retail diesel prices determined by the government. In contrast, after the government determined diesel price in October 2005 reached 4300 Rupiah per litre, retail diesel prices in the real world increased from 4300 Rupiah per litre up to 5000 Rupiah per litre in rural and urban areas. Comparing with an

escalating retail gasoline prices, retail diesel prices increased in the society not beyond doubt varied as high as retail gasoline prices. Percentage of households at middle and lower-income level using diesel was very small, 8 respondents from the total respondents. Figure 5.3 illustrates fluctuation of retail diesel prices before and after government price together with retail diesel prices in the society.

Figure 5.3 Fluctuations of Retail Diesel Prices (in Rupiah) Based on Field Observation Before and After the Government Declared New Diesel Price in 2005



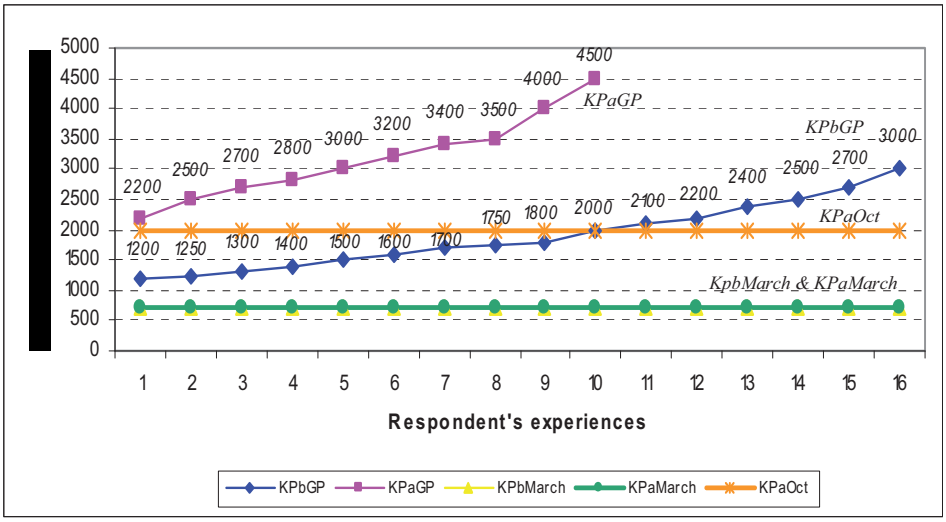
Note: - DPbGP &DPaGP (Diesel prices before & after government price resolution), DPbMarch & DPaMarch (Government price resolution of diesel price before & in March 2005), and DPaOct (Government price resolution of diesel price in October 2005).
- The variation of the oil prices in the Figure 5.3 derived from oil price data surveyed in the society, (no strict scale value of performance in figure).

Source: Own presentation based on data collected in Aceh during the years 2005-2006

A tremendous expose of the oil prices increases in 2005 was retail kerosene prices in the society. In March 2005, the government decided to increase oil price except for kerosene price in which kerosene prices remained at the previous price amount of 700 Rupiah per litre. The retail kerosene prices in the society increased automatically beyond government kerosene prices which varied from 1200 Rupiah per litre up to 3000 Rupiah per litre. It was influenced by psychological effects of people who predicted that the kerosene prices will increase after the government implemented the new gasoline and diesel prices. For speculative purposes, certain individual in society accumulated kerosene stocks as much as possible so that it engendered the scarcity of kerosene in society. Thus, retail kerosene prices in society became

higher. Fluctuation of retail kerosene prices recompensed by the consumers in rural and urban areas is depicted by Figure 5.4 as follows:

Figure 5.4 Fluctuations of Retail Kerosene Prices (in Rupiah) Based on Field Observation Before and After the Government Declared New Kerosene Price in 2005



Note:- KPbGP &KPaGP (Kerosene prices before & after government price resolution), KPbMarch & KPaMarch (Government price resolution of kerosene price before & in March 2005), and KPaOct (Government price resolution of kerosene price in October 2005).
- The variation of the oil prices in the Figure 5.4 derived from oil price data surveyed in the society, (no strict scale value of performance in figure).

Source: Own presentation based on data collected in Aceh during the years 2005-2006

Additionally, while the government settled on formulating new kerosene price to higher level, 2000 Rupiah per litre in October 2005, the households really faced the shocking real retail prices which are more than twofold government kerosene price ranged 2200 Rupiah per litre up to 4500 Rupiah per litre. This situation negatively affected the socio-economic conditions of households both in rural and urban areas. As of 744 respondents interviewed in this study, 636 respondents (85.5%) both in rural and urban areas used up kerosene for their daily economic and non-economic activities, whereas a number of 108 respondents (15.5%) utilized gas or firewood as another choice. This condition portrays that the dependency of households, especially at the middle and lower-income level to consume kerosene, was high. Thus, when retail kerosene price increased extremely, most households at the lower-income level received its harmful impact. Assuming household income was constant, and it was enough to cover

living costs at the previous months. However, now, it is not really enough to cover the living costs in the same way as before.

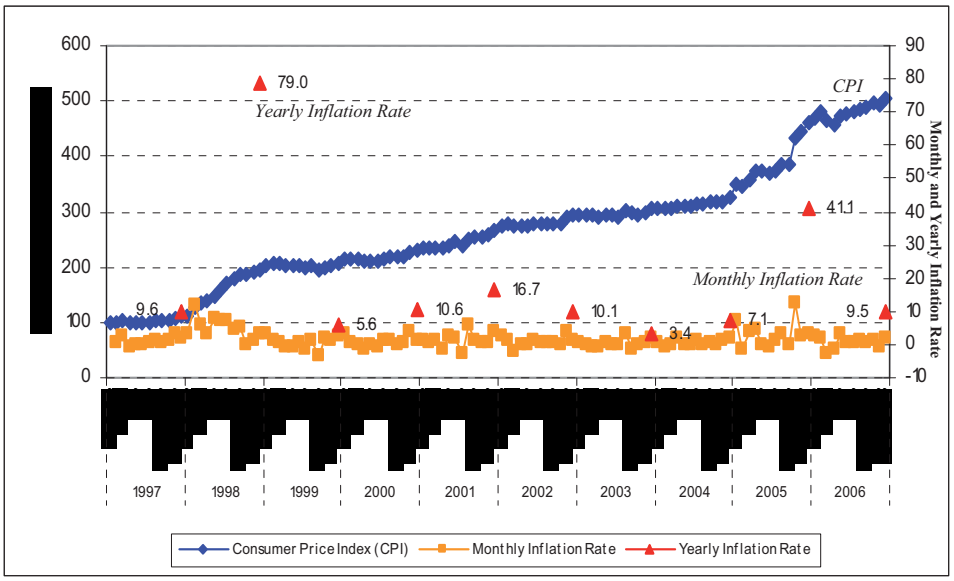
In addition to the impact of the oil prices increases as a fundamental issue, the scarcity of gasoline, kerosene, and diesel supply was also a great quandary experienced by households in Aceh generally. Consistent with the field study, the shortage of oil stock both in rural and urban areas was relatively often. It was stated by 35.4 percent of 744 respondents. Whereas, 64.6 percent respondents affirmed that the paucity of oil supply was seldom. Moreover, the duration of oil shortage was usually around 3 days as strengthened by 31.4 percent of 744 respondents and occasionally only 2 days excused by 24.6 percent, and just 1 day described by 14.8 percent respondents. Standing in front of the scarcity of oil stock in Aceh, most households 57.8 percent took a crack at looking for oil stock to the other places. While 31.0 percent respondents just wait for the normal conditions of oil supply and only 11.2 percent respondents made an effort by using another alternative.

5.1.3 Consumer Price Index (CPI) and Inflation Rate

As a consequence of oil price increases, poor and middle-income households in rural and urban areas will be confronted with considerable uncertainty and increasing living cost. This was indicated by earlier by the impact of higher consumer price index (CPI) on real income. The oil prices increases lead to more inflation – measured at the level of consumer prices – in Aceh which tightly impinged on the whole economic aspects. It implies that the proliferation of the oil price changes will dampen economic activities down or may even reduce them. Households with low and medium income levels are especially hurt by higher inflation even though their nominal income might also increase eventually as adjustment to the higher oil prices. Usually, the rises in nominal income are not as strong to fully compensate for the price hikes. On the other hand, it commonly takes time until the initial price increases for oil trickle through the entire economy. Hence, inflation might continue well after this initial time. Since it also might lead to higher wages a wage-price spiral can be triggered. Consequently, households with certain income levels, especially poor and middle-income households, whether in rural or urban areas located, are definitely trapped into the vulnerability to poverty and even they are currently poor will be the poorest (chronic poverty). The portrait of the

consumer price index and the expansion of monthly and yearly inflation rate[69] in Aceh based on current prices during 1996-2006 are presented in Figure 5.5.

Figure 5.5 Monthly Consumer Price Index (CPI) and Monthly and Yearly Inflation Rate in Aceh at Current Prices, 1996-2006



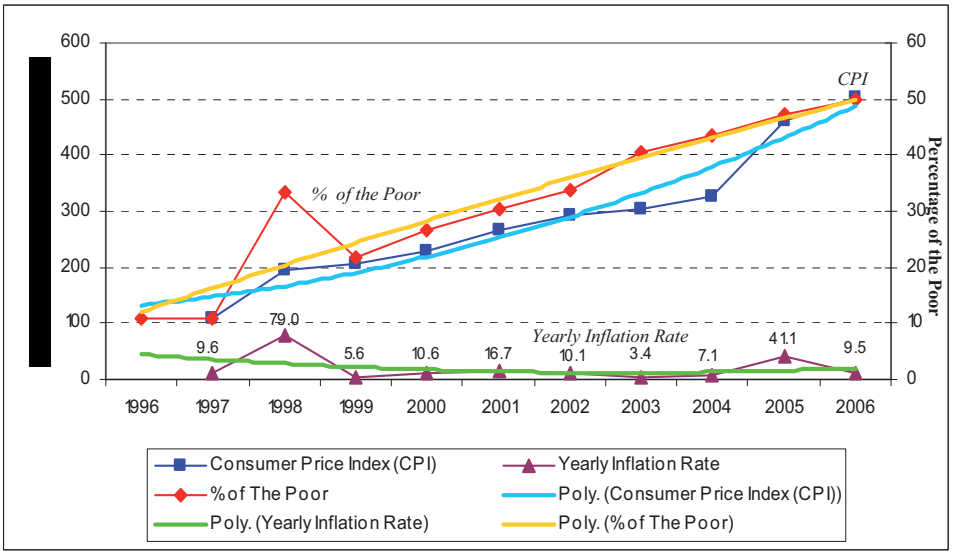
Source: Own calculation based on the CBS data of Aceh from the years 1996-2006

For the duration of the years 1998 and 2005, inflation rate in Aceh reached the steep peak. The highest level of inflation rate in 1998 was instigated by tremendously economic crisis which influenced on the whole Indonesian economic aspects and regional economy as well. This situation was also enormously faced by NAD province as indicated by precipitous inflation rate during this year. Thereafter, the inflation rate became a little unvarying oscillation until the year 2000. Nevertheless, during the beginning of the year 2000 until at the end 2004, the inflation rate had a tendency to increase slowly. These conditions were

69) This study attempts to illustrate two performances of the development of inflation rate i.e. (i) monthly inflation rate represents the current inflation rate per month computed by $[((CPI_t - CPI_o)/CPI_o)\ x100]$ and (ii) yearly inflation rate is calculated by the formula $[((CPI_{t=Current\ December} - CPI_{o=Previous\ December})/CPI_{o=Previous\ December})\ x100]$. In addition, the inflation rate per month at constant price 1996 (equal to 100) is expressed by the formula $[((CPI_t - CPI_{1996})/CPI_{1996})\ x100]$ as the other measurement. The implicit existence of monthly inflation rate based on constant price 1996 also becomes very important in this study because it enables to indicate strictly decreasing real income configuration in Aceh for the years 1996-2006. The results show that if we assumed 1Rupiah (Rp1) in 1996 (before economic crises hit the Indonesian economy), it would be equal to 403.3 Rupiah (Rp403.3) in 2006. It implies that the worth of money sharply devalued or the condition of real income pattern was significantly worsened by any means during this period (money illusion). Accordingly, it illustrated highly increasing prices as indicated higher inflation rate in Aceh.

triggered by some hindrances in Aceh, for instance political issues between the Free Aceh Movement and the Indonesian National Army as well as very horrible earthquake and tsunami catastrophe at the end 2004. Afterwards, in 2005[70], the Indonesian government launched an increase of twofold oil prices within the same year, especially in March and October over three types of the oil prices: gasoline, diesel, and kerosene prices which induce the second the steep peak of inflation rate in Aceh. Therefore, the oil prices increases have speeded up increasing inflation rate in Aceh at the significant level (see Figure 5.5 above).

Figure 5.6 Percentages of the Poor, the Consumer Price Index, and Inflation Rate in Aceh, 1996-2006



Note: Polynomial line of percentage of the poor, polynomial line of the CPI, and polynomial line of inflation rate represent trend behaviour of percentage of the poor, the CPI and inflation in Aceh during the years 1996-2006.

Source: Own presentation based on the Central Bureau of Statistics Data of Aceh, 1996-2006

Consistent with the report of the CBS of Aceh, the number of poor households in this region increased considerably over the years 1996-2006. Alone in 1996, the number of poor people increased by 426 thousands of a total population of 3.93 million (approximately 10.79%).

70) Additionally, increasing oil price on May 24th, 2008 induced a significant rise of inflation rate on average 0.83 percent per month. Ironically, the inflation rate relatively remained stable performance when the government reduced oil price on gasoline from 6000 Rupiah to 5500 Rupiah on December 1st, 2008 (as caused by significantly decreasing world oil prices) and subsequently on December 15th, 2008 the gasoline and diesel prices declined from 5500 Rupiah to 5000 Rupiah and 5500 Rupiah to 4800 Rupiah, respectively. Then, on January 15th, 2009 the government carried out decreasing gasoline and diesel prices again reached 4500 Rupiah of each excluding kerosene price. This represents that the consequences of increasing oil prices followed by higher inflation rate will be experienced harmfully by certain households, especially poor and middle-income households, through deteriorating real income.

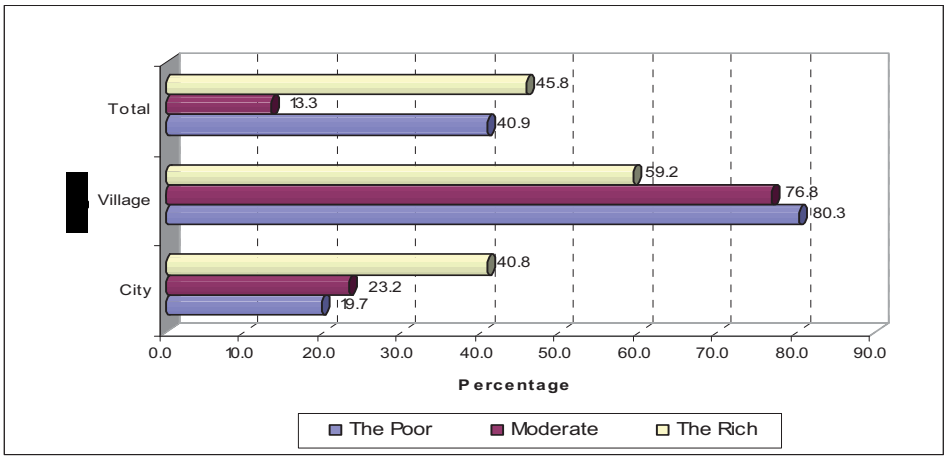
Subsequently, during the years 2000-2003, this figure went up also considerably. In 2001 26.5 percent (or 1.10 million) of the entire Aceh population of 4.16 million were initially considered to be below the poverty line. At the end of that year this percentage reached 30.43 percent (or 1.22 million) of total population of 4.02 million. By end of 2003, 40.39 percent (or 1.25 million) of a total population 4.21 million experienced an income below the poverty line. Afterwards, during 2004-2005, the number of the poor sharply increased again from 1.16 million to 1.90 million. The upsurge in the number of the poor in 2005 was triggered by the vulnerability of households to poverty by way of the implementations of oil price increase policies by the Indonesian government in March and October 2005 and the tsunami disaster at the end of December 2004. In addition, in the preceding Figure 5.6 it is shown how poverty, the consumer price index (CPI), and inflation rate are correlated in Aceh for the duration of the years 1996-2006.

5.1.4 The Characteristic of Poor Households

In order to provide a wide-ranging exploration in the direction of the impact of swelling oil prices on poor households in Aceh, the study is inaugurated by preceding investigation by means of looking at realistic situations in view of some specific characteristics of poor and middle-income households who are vulnerable to poverty. The scrutiny of these items on the subject of the characteristics of those is an incredibly imperative analysis as a previous description of the socio-economic dimensions of poor households, ordinarily in Aceh before and after getting higher oil prices which was implemented by the Indonesian government predominantly in 2005. A data set employed in this subsection with the purpose of presenting a picture of the socio-economic conditions of the poor is the primary data widely carried out in 2005-2006 from every part of the regencies in Aceh. For this reason, the enlightenment of the poor characteristics is genuinely expected to be able to illustrate the socio-economic conditions together with the encouraging feedback from the government on poor and middle-income households as a consequence of the oil prices increases in 2005. The oil prices increases in this year constituted an extraordinary occurrence in which the Indonesian government executed an expansion of the uppermost oil prices twofold at the same year as discussed in previous sections.

The primary data set collected uses questionnaires along with in-depth interviews on the households in the role of respondents by means of unambiguous questions. The issues are focused more on the socio-economic impact of poor households before and after the upward oil prices performed by the government as well as the responsibility of the government in managing this situation, particularly on the poor. The data set was collected during the year 2005-2006 on the whole regencies of the NAD Province, which was consisted of 21 regencies, 151 districts, and 744 respondents. The respondents were widely spread at urban areas 222 respondents and rural areas 522 respondents by using a random sampling method. It was considered as an appropriate approach owing to at that time, especially at the end of 2004 when Aceh experienced an extremely terrible earthquake along with a severe tsunami wave, in particular on December 26th, 2004. Accordingly, the availability of population and other related data at the destroyed areas faced an extreme critical situation and even no more left that had been swept up by the tsunami wave. At the beginning of discussions of the issues, Figure 5.7 unambiguously expresses the number of household sample of this study, which is widely spread in urban and rural regions in Aceh.

Figure 5.7 Share of Number of Households According to Nominal Income Level and Location in 2006 (in percentage)



Note: Nominal income of the poor is 20,000-150,000 Rupiah; nominal income of the moderate is 150,000-200,000 Rupiah;, and nominal income of the rich is 200,000-5,156,250 Rupiah
Source: Own presentation based on data collected in Aceh during the year 2006

Primary data of the study illustrates that moderate-income household amounted to 99 respondents consisting of 23 respondents (23.2 %) who live in the cities and 76 respondents (76.8 %) in the villages. Moreover, poor households amounted to 304 respondents comprising

by 60 respondents (19.7%) who live in the cities and 244 respondents (80.3%) in the villages, and rich households are 341 respondents, which was composed of 139 respondents (40.8%) who live in the cities and 202 respondents (59.2%) in the villages (see Table 5.2). The determination of household classifications was highly founded on the nominal income criteria of the household head. Derived from a number of samples collected from the field study, the characteristics of the poor are classified into three most important categories such as (i) description of the socio-economic conditions; (ii) behaviours and attitudes of the poor when the oil prices increase along with the government role towards the impact of the increase in oil prices on the poor; (iii) as well as the responsibility of the national and local government, particularly in managing the impact of the oil prices increases. The following Table 5.2 demonstrates a number of households consistent with the nominal income classifications, locations, and household size.

Table 5.2 Number of Respondents According to Nominal Income Level and Locations Together with Household Size by Household Groups in 2006 (in percentage)

Regions	Poor Income		Moderate Income		High Income		Total	
	Number of Households	%	Number of Households	%	Number of Households	%	Number of Households	%
Village	*244*	*80.3*	*76*	*76.8*	*202*	*59.2*	*522*	*70.2*
City	*60*	*19.7*	*23*	*23.2*	*139*	*40.8*	*222*	*29.8*
Total	*304*	*40.9*	*99*	*13.3*	*341*	*45.8*	*744*	*100.0*
Household size								
1	*0*	*0.0*	*0*	*0.0*	*2*	*0.6*	*2*	*0.3*
2	*7*	*2.3*	*4*	*4.0*	*14*	*4.1*	*25*	*3.4*
3	*19*	*6.3*	*17*	*17.2*	*56*	*16.4*	*92*	*12.4*
4	*55*	*18.1*	*29*	*29.3*	*80*	*23.5*	*164*	*22.0*
5	*70*	*23.0*	*26*	*26.3*	*69*	*20.2*	*165*	*22.2*
6	*65*	*21.4*	*9*	*9.1*	*58*	*17.0*	*132*	*17.7*
7	*47*	*15.5*	*3*	*3.0*	*37*	*10.9*	*87*	*11.7*
8	*26*	*8.6*	*6*	*6.1*	*15*	*4.4*	*47*	*6.3*
9	*7*	*2.3*	*4*	*4.0*	*2*	*0.6*	*13*	*1.7*
10	*8*	*2.6*	*1*	*1.0*	*8*	*2.3*	*17*	*2.3*
Total	*304*	*100*	*99*	*100*	*341*	*100*	*744*	*100*

Note: Household size refers to a number of household members
Source: Own presentation based on data collected in Aceh during the year 2006

Socio-economic characteristics of poor households indicate a quite large household size; on average 3 members but going up to 7 members in one family. However, a big household size approximately 5 and 4 members in one family was possessed by 22.2 percent (165 respondents) and 22 percent (164 respondents), respectively. A household size with more than

5 members in a family was dominated by the poor and the rich. The biggest number of household size who has a number of 5 members in one family was dominated by poor households by 23 percent (70 of 304 respondents of the total of the poor). Conversely, moderate and rich households merely had the same numbers, namely 4 members of each family. This illustrates that the dependency ratio of poor households was greater than moderate and rich households.

With 27.6 percent the major profession of the respondents' household head is farming (see Table 5.3). Poor households had an enormous percentage, which added up to 41.1 percent of total poor respondents. Moderate and rich households only came to 34.3 percent and 13.5 percent of total respondents (99 and 341 respondents, respectively). The second customary profession of the household heads was traders, which amounted to 19.1 percent of total respondents. In keeping with this proportion, the rich and the moderate incomes had a greater number as a trader than poor household, which amounted to 29.6 percent and 20.2 percent, respectively. The poor had very small percentages who worked as a trader indicated by 6.9 percent. At last, the occupation of the household heads as civilian government employers was 12.9 percent of total samples decomposed specifically 24.9 percent of rich families, moderate households amounted to 9.1 percent and poor households added up to only 0.7 percent.

Table 5.3 Main Profession of Respondents by Household Groups in 2006

Main Profession	Poor Income		Moderate Income		High Income		Total	
	Number of Households	%	Number of Households	%	Number of Households	%	Number of Households	%
*Death of main income Source**	*52*	*17.1*	*5*	*5.1*	*28*	*8.2*	*85*	*11.4*
Farmer	*125*	*41.1*	*34*	*34.3*	*46*	*13.5*	*205*	*27.6*
Trader	*21*	*6.9*	*20*	*20.2*	*101*	*29.6*	*142*	*19.1*
Unskilled industry labour	*2*	*0.7*	*0*	*0.0*	*2*	*0.6*	*4*	*0.5*
Coolie labour	*14*	*4.6*	*5*	*5.1*	*3*	*0.9*	*22*	*3.0*
Unskilled farm labour	*36*	*11.8*	*2*	*2.0*	*2*	*0.6*	*40*	*5.4*
Services/motor driver	*11*	*3.6*	*6*	*6.1*	*8*	*2.3*	*25*	*3.4*
Civilian Govnt. worker	*2*	*0.7*	*9*	*9.1*	*85*	*24.9*	*96*	*12.9*
Jobless	*3*	*1.0*	*0*	*0.0*	*1*	*0.3*	*4*	*0.5*
others	*38*	*12.5*	*18*	*18.2*	*65*	*19.1*	*121*	*16.3*
Total	*304*	*40.9*	*99*	*13.3*	*341*	*45.8*	*744*	*100.0*

Note: * Researcher interviewed with the other household head such as his wife or the oldest child of their children as current main income sources of the family.
- Coolie labour refers to their time (work) which is compensated by the lowest wage and they usually get food and drink per day of work.

Source: Own presentation based on data collected in Aceh during the year 2006

Departing from the structural profession of household heads points out that the poor were exceedingly correlated with the farming occupation, but the rich as well as moderate-income household lead to having two livelihoods of household head's profession as a trader and civilian government employer. Evidently, a profession of the household head had a strongly coherent relationship in accordance with the education level experienced by the household head. Poor households on average had an education level at the primary school by 25.3 percent and no formal education level was approximately 18.1 percent of 304 total poor households (see Table 5.4). Additionally, rich households possessed a higher education level than other households as indicated by a number of rich household heads in senior high school amounted to 46.3 percent and even at the university level with a significant percentage, explicitly 22.6 percent. Meanwhile, moderate-income households had a rather higher level of education than the poor, mostly them on average educated at the primary school and secondary school, approximately 25.3 percent and 24.2 percent of 99 total respondents of moderate households, respectively.

Table 5.4 Education Level of Respondents by Household Groups in 2006

Education Level	Poor Income		Moderate Income		High Income		Total	
	Number of Households	%	Number of Households	%	Number of Households	%	Number of Households	%
*Death of household head**	*52*	*17.1*	*5*	*5.1*	*28*	*8.2*	*85*	*11.4*
No formal education	*55*	*18.1*	*12*	*12.1*	*11*	*3.2*	*78*	*10.5*
Primary school	*77*	*25.3*	*25*	*25.3*	*26*	*7.6*	*128*	*17.2*
Secondary school	*57*	*18.8*	*24*	*24.2*	*41*	*12.0*	*122*	*16.4*
Senior high school	*60*	*19.7*	*31*	*31.3*	*158*	*46.3*	*249*	*33.5*
University	*3*	*1.0*	*2*	*2.0*	*77*	*22.6*	*82*	*11.0*
Total	*304*	*100.0*	*99*	*100.0*	*341*	*100.0*	*744*	*100.0*

Note: * Researcher interviewed with the other household head such as his wife or the oldest child of their children as current main income sources of the family.
Source: Own presentation based on data collected in Aceh during the year 2006

As the survey data show, poor households have rather specific socio-economic characteristics, namely greater household size and mainly a profession as a farmer along with a lower education level. However, rich households have slightly different socio-economic characteristics, relative smaller household size and prominent occupation of the household head is trader and civilian government employer over and above having higher education levels compared to moderate-income and even poor households. This provided a huge impact

on the different income patterns which were received by each household such as the poor, the moderate-income and the rich. Before the rising of oil prices in 2005, the nominal income per capita of 40.86 percent of poor households took delivery of income equal to 20000-150000 Rupiah per month and 13.31 percent of moderate-income level households came to in the region of 150000-200000 Rupiah per month as well as 45.83 percent of rich households received around 200.000-5156250 Rupiah per month[71] (see Table 5.5).

In contrast, after the government performed the oil prices increases as a result of plummeting oil subsidies in March and October 2005, the structure of nominal income per capita per month of households led to a significant change where 2.96 percent of the families with moderate monthly income experienced an increase over their nominal income per capita. Moreover, 6.99 percent of households with poor monthly nominal income per capita also enjoyed a rise in their income. Consequently, the share of households with high income went up by approximately 10 percentage point to be 55.78 percent. It means that a number of rich households grew up to be a superior number as a consequence of the effect of the oil prices increases on the nominal income per capita of respondents. This was indicated by the amount of 10 percent respondent experienced an increase in nominal income per capita per month, especially moderate and poor households.

Table 5.5 Monthly Household Incomes per Capita of Respondents Before and After the Oil Prices Increases in 2005 by Household Groups in 2006

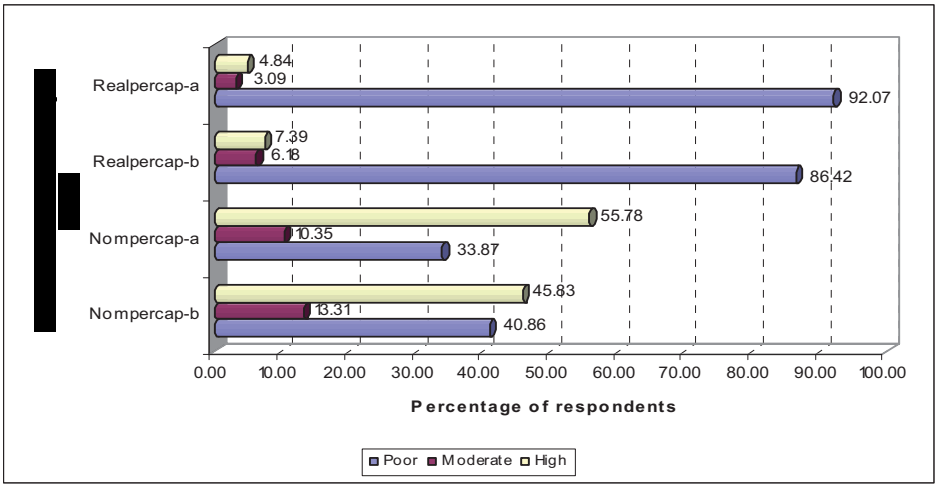
Household Income	Unit of measurement	Nominal Income before	Nominal Income after	Change	Real Income before	Real Income after	Change
Poor	Number of households (Rupiah)	304 (20000-150000)	252 (20000-150000)	52	643 (1342-10062)	685 (834-6255)	42
	% of total households	*40.9*	*33.9*	*6.99*	*86.4*	*92.1*	*5.65*
Moderate	Number of households (Rupiah)	99 (150000-200000)	77 (150000-200000)	22	46 (10062-13415)	23 (6255-8339)	23
	% of total households	*13.3*	*10.3*	*2.96*	*6.2*	*3.1*	*3.09*
High	Number of households (Rupiah)	341 (200000-5156250)	415 (200000-5156250)	74	55 (13415-345864)	36 (8339-214993)	19
	% of total households	*45.8*	*55.8*	*9.95*	*7.4*	*4.8*	*2.55*

Note: The determination of household real income is obtained by dividing household nominal income by the inflation rate in Aceh before and after the oil prices increases in 2005 and also referred to data base from the Central Bureau of Statistics of Indonesia pertaining to the household groups.
Source: Own presentation based on data collected in Aceh during the year 2006

71) The classification of the household income determined in this empirical study based on the Poverty Line was published by the Central Bureau of Statistics of Indonesia in 2005.

The impact of the spreading out of oil prices did not purely stimulate nominal income per capita per month of households but also significantly brought about decreasing real income per capita on the poor and the moderate-income households as a result of prices as generally increased. The real income of three household groups was obtained through dividing the nominal income by the inflation rate before and after the oil prices increases in 2005. Relied on the real income per capita examination, after rising oil prices, a number of poor and the moderate and even rich households were trapped into the poverty conditions. So, a number of the poor were to be larger enough in the amount of 86.42 percent of 744 total respondents before the government oil price policy implemented in 2005. Thus, after the implementation of the government oil price policy in March and October 2005, a number of poor households turned into a bigger number to be 92.07 percent of 744 total respondents (see Figure 5.8).

Figure 5.8 Share of Total Population in Three Household Income Groups Based on Nominal and Real Income Per Capita Before and After The Government Oil Price Policy in Aceh in 2006 (in percentage)



Note: Nompercap-b/a (Nominal per capita income before and after government oil price policy) and Realpercap-b/a (Real per capita income before and after government oil price policy).
Source: Own presentation based on data collected in Aceh during the year 2006

Increasing nominal income of poor households was strongly stimulated by wage rate growth, but the wage rise was really not equal to an increase in commodity prices or inflation rate. Consequently, the poor real income dropped drastically. This situation is called pseudo income effect. Hence, these phenomena induced a number of poor households to be larger and larger in Aceh as the unnecessary shock of increasing oil prices. It was strengthened by the

broad-spectrum implication of inflation at higher level in spite of the nominal income of households in Aceh which led to be a little bit better improvement as a result of the implementation of a new regional government administration law such as special regional autonomy[72]. In line with the socio-economic conditions of households in Aceh explained beforehand, it indicates that the rate of the vulnerability of households to poverty in Aceh still remains as one of crucial issues, particularly both in city areas and even village areas. Moreover, the rear-ender of the oil prices increases stimulated a response of the local government to be in charge of its negative side by way of performing the compensation due to oil prices increases. Anchored in 744 respondents illustrate that barely 345 respondents[73] (46.4%) received poor card as government compensation as a result of rising oil prices. They were encompassed by 58 moderate households (58.6%) from 99 moderate households; 238 respondents (78.3%) from 304 poor households; and 49 respondents (14.4%) from 341 rich household, respectively. In fact, there were three categories of government compensation in general such as rice and health support, schooling children assistance through providing scholarship, and business capital support to maintain the sustainability of small economic activities of appropriate households.

The biggest priority of government assistance at that time was rice and health support for households. A number of moderate households received government rice aid 57 respondents (57.6%) of 99 moderate households. Then, 234 respondents (77.0%) of 304 poor households also received rice support and included rich households 42 respondents (12.3%) of 341 rich households. So, the total households obtained government assistances by 333 households (44.8%) from 744 respondents. Besides, government assistances which focused on the family, there was government assistance for education as well especially for the children in schooling.

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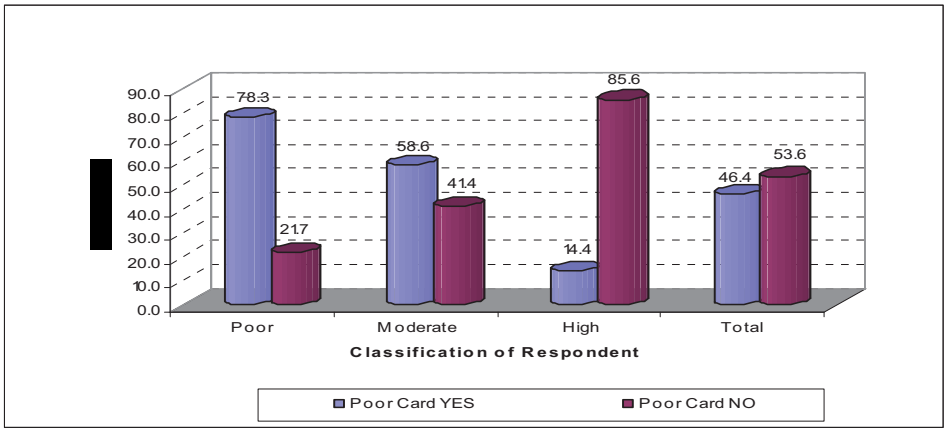
72) Actually, the real households' income should increase significantly owing to the implementation of decentralization accompanied by the Law No. 22/1999 (regional autonomy) and the Law No. 25/1999 (financial sharing between central government and regional government). It was followed by the special autonomy status of Aceh along with the Law No. 18/2001 which generate an extreme increase in the General Fund Allocation (DAU), a massive rehabilitation and reconstruction fund after tsunami December 26, 2004, and the new Aceh's Provincial Government Administration Law (Special Autonomy Fund) in the company of the Law No.11/2006.

73) Generally, the substantial condition for receiving the poor card is the family categorized as poor households and determined frequently by the chief of village (Kepala Desa) which relied on subjective observations of each household in the village (no standard economic calculations such as income). The weaknesses of determined standard requirements openly generate wrong actions in implementing the relief programs.

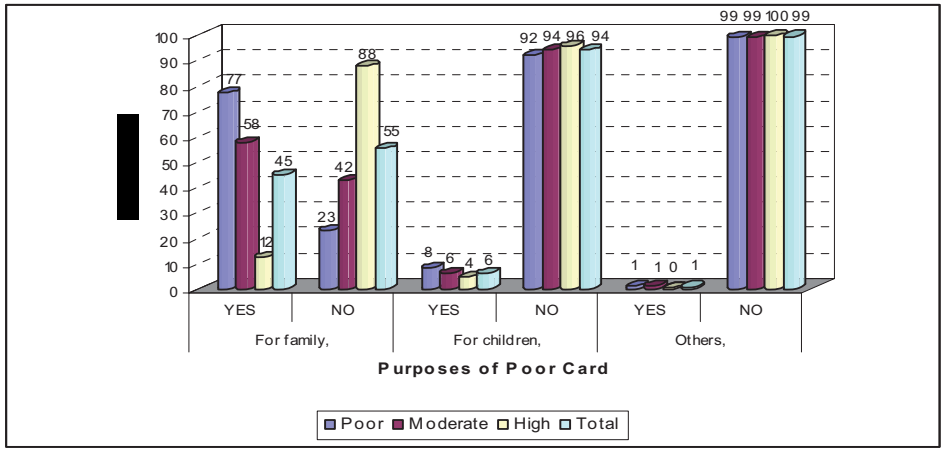
46 households (6.2%) of 744 households were surveyed who received scholarship. They were consisted of 6 (6.1%) moderate households, 25 (8.2%) poor households, and 15 (4.4%) rich households. In addition, government aid for encouraging small economic activities of households from the impact of the oil prices increases were only 1 (1%) of moderate households, 3 (1%) of poor households, and 1 (0.3%) of rich households. Subsequently, the total households who received government compensation for capital encouragement in connection with the business sustainability were just 5 households (0.7%) of 744 respondents. The detailed information of households who obtained government compensation as a consequence of increasing oil prices in Aceh is illustrated by Figure 5.9 and Figure 5.10 as follows:

Figure 5.9 Percentage of Poor Card Received by Households in Aceh in 2006



Source: Own presentation based on data collected in Aceh during the year 2006

Figure 5.10 Purposes of Poor Card Received by Households in Aceh in 2006



Source: Own presentation based on data collected in Aceh during the year 2006

From the fact that the government policy of maintaining the stability of the socio-economic conditions of poor households has not been achieved, one can conclude that the role of the local government in ensuring the better socio-economic conditions for the poor as a result of the adverse shock of oil prices increases was not sufficient enough to mitigate the poor from the negative effect of this price increase. In reality, a lot of poor and moderately poor households did not receive appropriate compensation and even did not obtain the equal opportunities in actuating better living conditions from the local government. In contrast, some higher-income households received the government compensation for the oil prices increases. This situation is exemplified by the actions of the local government reimbursement program that had not accurately achieved the goal of reducing the vulnerable households to poverty. The reasons for these are (i) low capability of the government, especially the local government management; (ii) lack of comprehensive and representative data related to the socio-economic classifications of households both in rural and urban areas who are entitled and should receive government help; (iii) the limitation of government understanding pertaining to the concept of poverty and the vulnerability of households to poverty as a multidimensional and dynamic problem; (iv) and no serious commitment in combating poverty alleviation in Aceh as indicated by the poverty rate getting higher and higher even though the local government fiscal revenues of Aceh has been increasing since 2001. In the next section 5.2, this study attempts to discuss the wide-ranging consequences of oil prices rises on income distribution issues across institutions in Aceh within the framework of direct, indirect and global accounting multipliers effect.

5.2 The Impact of Oil Prices Increases on Income Distribution across Institutions

The previous discussions by using qualitative analysis (DAA) illustrates that the impact of the oil prices increases has generated higher prices of goods and services which severely influenced on the societal welfare reduction. It means that the real income of households went down caused by higher prices. This is indicative of the strong impact the oil prices increases have on real income and poverty through pushing up the inflation rate. Fatefully, on the other hand, government compensation also did not completely protect the poor and moderate income-households from the depressing impact of oil prices increases. Consequently, this

situation will generate a new gap level among households in economic activities and social living conditions in Aceh. In turn, the inequality rate of income distribution across institutions in Aceh becomes higher and higher. In other words, the implementation of oil subsidy reduction program by the Indonesian government since 1999 and in 2005 significantly impacted the macro economy and the real income of institutions in the region of Aceh, accounting for direct, indirect, and global accounting multipliers effect. The analysis of real income distribution across institutions, therefore, turns out to be important for shedding light on the pattern of changes over time; in this case from the year 2002 to 2005. Hence, a further inquiry is necessary to examine the inequality of income distribution across institutions in Aceh. Accordingly, this analysis utilizes a quantitative approach such as the social accounting matrix analysis (SAM-based model) accompanied by accounting multiplier decomposition analysis which offers a snapshot view on transfer, open-loop, and closed-loop effects as well as direct, indirect and global accounting multipliers. This is done by looking at SAM data constructed for two years; i.e. 2002 and 2005 as basis. It is also expected that this investigation is able to indicate how the income distribution pattern across institutions expressing the development of the various economic sectors were affected by the oil prices increases through inflation rate corresponding to direct, indirect, and global accounting multipliers effect.

In order to reveal these impacts, the focus is on effects on income distribution. The oil prices increases caused by a reduction of government oil subsidies[74] through increasing inflation rate are considered and illustrated extensively in subsections 5.2.2 and 5.2.4 as well as 5.2.6. The main focus question is how big of decline in real income of the various institutions, especially the household groups occurred as a result of prices increase. As institutions, the grouping

[74)] Actually, the effects of exogenous injections on the whole economic system can be explored by accounting multiplier analysis which requires partitioning the SAM into endogenous and exogenous accounts. Typically the former include (i) factors; (ii) institutions (companies and households); and, (iii) production activities; while the exogenous accounts consist of (iv) government; (v) capital; and (vi) rest of the world (Defourny and Thorbecke, 1984). The following subsections 5.2.2, 5.2.4 and 5.2.6 intently talk about real income distribution of institutions as a consequence of higher inflation rate caused by oil price increases within the framework of direct, indirect, and global effects. However, in the subsections 5.2.1, 5.2.3, and 5.2.5 are meant to provide the preliminary description of income distribution among institutions in Aceh for the years 2002 and 2005. In general, the chain formation of the accounting multipliers follows the Figure 4.1 depicted in chapter 4 above i.e. the effects in production activities on institution groups through factor income within the framework of endogenous accounts.

referred to in the preceding chapter will be used; i.e. households, firms, and the government. Then households are classified into five groups: the poorest, the poor, the middle-income household, the rich, and the richest both in rural and urban regions. This section is structured as follows. First, the subsection 5.2.1 presents the essential structure of direct accounting multipliers. Subsection 5.2.2 discusses nominal and real income distribution among institutions influenced by the increase in oil prices. Second, in the subsection 5.2.3 and 5.2.4 provide indirect accounting multipliers and nominal and real income distribution among institutions affected by the oil prices increases. Third, in the subsection 5.2.5, this study provides the prototype of global accounting multipliers of institutions which is able to show direct and indirect effects in chorus. Later on global accounting multiplier is decomposed into three main components i.e. transfer effects, open-loop effects, and closed-loop effects. This is followed by the subsection 5.2.6 which discusses the global impacts of oil prices increases through inflation rate on real income distribution among institutions.

5.2.1 Direct Accounting Multipliers Effect on Income Distribution across Institutions

In 2002 and 2005, the inequality of the income distribution among institutions-the poorest, poor, middle-income, rich and the richest households; the firms; and the government- were high as pointed out by significant differences in accounting multipliers of institutions according to direct accounting multiplier effect analysis. The values of accounting multipliers illustrates that if there is a change of the exogenous accounts (i.e. government; capital; and rest of the world) by 1 percent, it will affect the endogenous accounts (i.e. factors; institutions including households, companies and government; and production activities) by a certain percentage change of accounting multipliers of each institution. Based on this study, most of higher income households, the government, and firms are attributed with significant accounting multipliers. However, the firms' accounting multipliers are the greatest ones from the others. Table 5.6 illustrates that accounting multipliers of the firms reached 113.55 percent in 2002 and then reduced to 109.43 percent in 2005 derived from sum total of its accounting multipliers. There is substantial indication that reduction of the firms' accounting multipliers was affected by the oil prices increases in 2005. Nevertheless, the firms still are the ones with highest level of accounting multipliers among all other institutions. The highest accounting

multipliers of the firms in 2002 were mainly from the primary sectors which contributed approximately 45.21 percent. The tertiary and secondary sectors contributed 34.90 percent and 33.44 percent, respectively. Meanwhile, the contribution of the tertiary sectors played a big role in supporting the firms' accounting multipliers around 57.43 percent in 2005. The other sectors such as primary and secondary sectors contributed 33.77 percent and 18.22 percent, respectively. From the workings of firms' accounting multipliers illustrated above one can see that there was a shifting donation of each economic sector to the firms after rising oil prices in the year 2005 as indicated by decreasing secondary sectors' accounting multipliers. This was probably generated by the impact of subsidy reduction on oil implemented by the Indonesian government in 2005 which influenced oil prices increases. As a result, the firms faced with higher production cost and subsequently tried to adjust to new market price equilibrium for inputs and outputs in order to maintain the their maximum profit in future period. This situation is explicitly illustrated in the following Table 5.6, which reports on the institutions' accounting multipliers consisting of household groups, firms, and the government for the years 2002 and 2005.

Table 5.6 Direct Accounting Multipliers Effect on Income Distribution across Institutions by Economic Sectors in Aceh for the years 2002 and 2005 (in percentage)

Institutions	2002						Institutions	2005					
	Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)		Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)
	Primary	Secondary	Tertiary					Primary	Secondary	Tertiary			
HHVPR	0.98	1.20	1.77	3.95	21.8	22.5	*HHVPR*	1.97	1.46	3.21	6.64	21.1	21.7
HHVPU	1.27	1.75	2.68	5.69	13.9	13.8	*HHVPU*	3.15	2.79	5.14	11.08	13.5	13.3
HHPRR	1.75	2.16	3.28	7.19	16.1	14.7	*HHPRR*	3.53	2.71	5.62	11.86	15.6	14.3
HHPRU	1.49	2.07	3.18	6.75	7.9	8.9	*HHPRU*	2.71	2.42	4.68	9.80	7.7	8.6
HHMIR	4.27	3.78	5.01	13.06	11.8	11.1	*HHMIR*	6.30	3.14	4.39	13.84	11.4	10.7
HHMIU	4.30	3.66	5.80	13.76	10.6	10.7	*HHMIU*	7.33	3.49	5.99	16.80	10.2	10.3
HHRR	2.80	3.37	9.01	15.18	8.0	7.0	*HHRR*	4.22	3.07	7.79	15.08	7.7	6.8
HHRU	3.90	3.35	4.51	11.76	6.2	7.4	*HHRU*	6.48	3.20	5.18	14.85	6.0	7.1
HHVRR	3.09	2.35	3.69	9.13	4.0	4.3	*HHVRR*	4.43	1.93	3.85	10.22	3.9	4.1
HHVRU	3.18	2.86	4.41	10.45	3.1	3.1	*HHVRU*	4.34	2.57	6.90	13.81	3.0	3.0
COMPY	45.21	33.44	34.90	113.55			*COMPY*	33.77	18.22	57.43	109.43		
GOVRM	5.72	4.23	4.42	14.37			*GOVRM*	7.28	3.93	12.38	23.58		
M-Total	77.96	64.22	82.66				M-Total	85.52	48.92	122.55			

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers).

- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

In fact, the highest accounting multipliers of the firms were specifically from economic sectors such as agriculture, fishery, mining and quarrying as well as forestry which contributed approximately 10 percent. In addition, there were some other economic sectors which also generated the high accounting multipliers for the firms. For instance, transportation and finance sectors contributed less than 10 percent. The other economic sectors which also produced relatively higher accounting multipliers to the firms of more than 5 percent were wood, chemistry, electricity, construction, services, as well as trading sectors. This is represented in Table A3.1 (Appendix 3). Figures of higher accounting multipliers of the firms from some economic sectors in Aceh in 2002 and 2005 indicate that the firms in Aceh highly concentrated their investment on only some potential economic activities. These are substantial and strategic economic sectors in Aceh as indicated by their significant contributions to the GRDP of Aceh annually (see Tables 2.1 and 2.2 in chapter 2). This behaviour is aimed at creating opportunities in maintaining maximum profit even though the oil prices were increased by the Indonesian government in 2005.

In contrast, the poorest and poor households both in rural and urban regions have relatively small accounting multipliers effect in 2002. Table 5.6 shows that higher accounting multipliers of these households were tightly contributed by tertiary sectors than the primary and secondary sectors. In fact, the main sources of accounting multipliers of theses households only came from administration and agricultural sectors which is related to unskilled labour. These sectors allow for insignificant payment to the poorest and the poor. In addition, the other sectors just gave the smallest accounting multipliers to the poorest and the poor. The detailed information is indicated in Table A3.1 (Appendix 3). So, if the government increases oil prices, it will significantly worsen socio-economic conditions of these households through direct or indirect accounting multipliers effect (higher inflation rate). In reality, increasing oil prices will raise higher inflation rate which occurred earlier than adjustments of income occurs. This condition is called a wage-price spiral. Besides, the adjustment of income is not proportional to the rising prices. It signifies that the negative effect of oil prices rises will generate an increasing vulnerability rate of poor and even middle-income households could be trapped into the poverty or will fall in the category of the

poorest households which is called a chronic poverty. This case illustrates that the poor is really powerless in reducing the negative effects of the shocks in the absence of the local government assistances. So far, unfortunately, the actions by the local government did not result in yet improvements in the socio economic conditions of the poor in Aceh.

In 2005, the situation of the income distribution among institutions in Aceh throughout this period was better compared to the 2002 especially for the poorest and poor households. It is represented by almost twofold upsurge of accounting multipliers of these institutions from the year 2002 (see Table 5.6). The accounting multipliers increase was probably induced by the implementation of some pro-poor relief programs in response to the oil prices increases in 2005 carried out by the Indonesian government. Likewise, the growth of accounting multipliers was also attributed to the other household, for instance middle-income households, rich and the richest households. But the soaring income of those household groups was not as big as the poorest and poor households' accounting multipliers in 2005. Nevertheless, an increase in accounting multipliers in this year did not portray the better quality of living conditions of poor households in 2005 compared to the year 2002. Because, the increase in accounting multipliers concurrently followed by the escalation of prices of goods and services in 2005 as indicated by higher inflation rate of roughly 41.1 percent (see Figure 5.5). It implies that the improving household income was tightly accompanied by rising general prices as indicated by higher consumer price index (CPI) as a result of the oil prices increases. Actually, there was no significant changes on real income increase of the poorest and poor households during this period (see Tables A3.1 and A3.2 (Appendix 3).

Moreover, there is a possibility for other institutions that have large accounting multipliers to protect themselves from higher price rise, by adjusting the performance of their production activities and management of capital consumption. Unluckily, the institutions that have relatively small accounting multipliers together with unskilled labour, such as the poorest and poor households, would suffer from greater increase of prices as indicated by reduction in purchasing power (real income). This condition affects household deteriorating its living conditions. Hence, the government oil pricing policy creates widely negative impact by

reducing the institution income, particularly of the poorest and poor households due to increase in the prices of goods and services. Also, its subsequent effect will also diminish the productivity of poor households concurrently as indicated by the factor income sources (unskilled labour) which were small in general.

In the following subsection 5.2.2 the focus is more on nominal and real income distribution across institutions within the framework of direct accounting multipliers effect of the oil prices increases. Basically, the impact of increasing oil prices will affect nominal and real income of institutions through higher inflation rate. This situation points up that the vicious circle of the oil prices increases as a consequence of declining subsidies on oil induce, on one side, the increase in nominal income of institutions because of rising nominal wage. On the contrary, it simultaneously diminishes their real income through higher prices of consumption goods and services. These correlated effects are resulted from the increase in oil prices which is generally called wage-price spiral effect (spiral inflation). Hence, this situation is discussed in the next subsection 5.2.2.

5.2.2 Nominal and Real Income Distribution across Institutions of Direct Accounting Multipliers Effect

Table 5.7 provides with an in-depth description of the nominal and real income among institutions, relying on direct accounting multiplier effect analysis. It also gives a further observation on changes in real income by comparing results based on institution groups in Aceh for the years 2002 and 2005. So, the income of most institutions in Aceh got worse illustrating real income change of direct accounting multiplier effect assessment[75]. Table 5.7 shows that middle-income households both in rural and urban areas experienced real income reduction owing to the consequences of the oil prices increases approximately 0.025 percent

[75] To capture the values of nominal and real income distribution across institutions of direct accounting multipliers effect, this study uses a simple technique. First, the values of accounting multipliers of each institution discussed in the subsections 5.2.1 is multiplied by the amount of total factor income of each institution relied on the SAM data for the years 2002 and 2005. These values are called as the nominal income effects. Afterward, the nominal income effects are divided by inflation rate of the years 2002 and 2005. Subsequently, these values are called as the real income effects. As a final point, to obtain the nominal and real changes of institution income, it is followed by subtracting between the values of nominal and real income effects. The results are presented in Table 5.7 for direct accounting multipliers effect. Moreover, the same technique is implemented for indirect and global accounting multipliers effect on income distribution among institutions within nominal and real income framework.

and 0.019 percent, respectively. The identical situation was also faced by the richest and rich households representing the negative values of real income in that time, in the amount of 0.032 percent and 0.014 percent for rich households in rural and urban areas as well as the richest households in rural and urban areas by 0.016 percent and 0.010 percent, respectively. In addition, the firms also faced the declining real income for this period amount of 0.254 percent. This situation illustrates that the effect of the oil prices increases at the first round will affect the majority of institutions with higher income level.

Table 5.7 Nominal and Real Income Distribution across Institutions of Direct Accounting Multipliers Effect in Aceh for the years 2002 and 2005

Institutions	N-Effect 2002 (%)	N-Effect 2005 (%)	N-Change (percentage points)	R-Effect 2002 (%)	R-Effect 2005 (%)	R-Change (percentage points)
HHVPR	*3.952*	*6.638*	*2.686*	*0.022*	*0.023*	*0.001*
HHVPU	*5.689*	*11.081*	*5.392*	*0.032*	*0.039*	*0.007*
HHPRR	*7.192*	*11.861*	*4.669*	*0.040*	*0.041*	*0.001*
HHPRU	*6.750*	*9.804*	*3.054*	*0.038*	*0.034*	*-0.004*
HHMIR	*13.058*	*13.836*	*0.778*	*0.073*	*0.048*	*-0.025*
HHMIU	*13.761*	*16.804*	*3.043*	*0.077*	*0.058*	*-0.019*
HHRPR	*15.175*	*15.081*	*-0.094*	*0.085*	*0.052*	*-0.032*
HHRPU	*11.761*	*14.852*	*3.092*	*0.066*	*0.052*	*-0.014*
HHVRR	*9.130*	*10.215*	*1.085*	*0.051*	*0.035*	*-0.016*
HHVRU	*10.454*	*13.806*	*3.352*	*0.058*	*0.048*	*-0.010*
COMPY	*113.549*	*109.427*	*-4.122*	*0.635*	*0.380*	*-0.254*
GOVRM	*14.374*	*23.583*	*9.209*	*0.080*	*0.082*	*0.002*

Note: - The computation of direct nominal and real effects on income distribution across institutions are merely relied on the factor income sources of institutions i.e. formal and informal labour and capital from production activities.
- HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), N-Effect 2002 (Percentage of Nominal income effect 2002), N-Effect 2005 (Percentage of Nominal income effect 2005), N-Change (Nominal income change), R-Effect 2002 (Percentage of Real income effect 2002), R-Effect 2005 (Percentage of Real income effect 2005), and R-Change (Real income change).

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

There is an exception for poor urban households in which the consequences of the oil prices increases directly affected them by reducing their real income in the amount of 0.004 percent. This condition depicts that the nominal income increase of poor households in urban areas were openly affected by higher prices increase in general. Consequently, their real income got worse in this period. It means that the poor in urban areas directly suffered from the oil prices increases. Nevertheless, the poorest households both in urban and rural areas as well as poor households in rural areas were not directly affected by the oil prices increases. This was indicated by small positive values of real income change. There is likelihood that the poor does not consume oil, especially gasoline and diesel at all. Maybe, they use kerosene in insignificant amount for supporting daily home economic activities. Therefore, they were not

affected directly by the oil price shocks due to the consumption behaviour of the poor in Aceh as oil is merely used for home activities. However, the circumstances of poor households will be worse off if the real income is measured in terms of per capita real. According to the CBS of Aceh the number of the poorest households in Aceh for the year 2005 was about 35 percent, both in rural and urban regions classified by 22 percent in rural and 13 percent lived in urban areas. Additionally, the number of poor household amount to 23 percent consisted of 14 percent living in rural area and 9 percent in urban area. So, the number of the poorest and poor households in Aceh reached approximately 58 percent in 2005 (see Table 5.6). Based on the description of the number of the poor in Aceh, poor households still face a difficult situation in improving the quality of their life in the future, if the local government does not quickly and properly deal with some precise programs to the poorest and poor households in Aceh. It means that the poorest and poor households as well as middle-income households were undoubtedly vulnerable to poverty. This illustrates that the income distribution in Aceh is still has a serious disparity because the accounting multipliers and real income per capita of poor households was very small. Implicitly, every government policy in the development process, especially increasing oil prices, has prompted a higher inequality of income distribution across institutions in Aceh for this period. Even despite that the government has performed some compensation policies during the oil price increases. Therefore, the oil prices increases created a wide income gap on institutions, particularly households, in Aceh as indicated by the different income distribution across institutions. It implies that the purposes of development policies conducted by the government until now are still far from what it should be, namely the equality of income distribution across institutions in Aceh. The different configurations of income distribution across institutions derived from the perspective of indirect accounting multipliers effect are provided in subsection 5.2.3.

5.2.3 Indirect Accounting Multipliers Effect on Income Distribution across Institutions

The indirect effect of the oil prices increases on the income distribution across institutions in Aceh in 2002 and 2005 can be also examined by using accounting multiplier with regards to

total influence[76] analysis. This subsection 5.2.3 describes the configuration of indirect accounting multipliers of institutions. The results of indirect accounting multipliers effect analysis, the firms experienced with larger accounting multipliers in the amount of 209.14 percent in 2002 and 196.96 percent in 2005 as indicated by its sum total of accounting multipliers. The largest contributions are provided indirectly by primary sectors (62.80%) and tertiary sectors (66.41%) for the year 2002 and tertiary sectors (103.95%) and secondary sectors (59.24%) for the year 2005. These values illustrate that if there is 1 percentage change in exogenous accounts ((i.e. government; capital; and rest of the world), it will provide accounting multipliers to the firms through primary and tertiary sectors with a certain amount of each sector. Table 5.8 shows that secondary sectors in Aceh contributed smaller accounting multipliers to the firms in 2002 and 2005 compared to primary and tertiary sectors and even the contribution of secondary sectors decreased significantly in the year 2005. In addition, the primary sectors' contribution also declined with smaller accounting multipliers by 59.24 percent in 2005 than the year 2002 by 79.93 percent. This indicates that the firms were indirectly affected by the government policy of the increase in oil prices as indicated by the decline of sum total of its accounting multipliers in 2005. The reduction of secondary sector's contribution highly affected on the whole of the firm's accounting multipliers in the year 2005 because of this sector has an important role in the economy of Aceh (see Tables 2.1 and 2.2). This condition definitely influenced on the economy of Aceh in general illustrated by declining of real income of institutions that have high reliance on secondary sectors. This situation is comprehensively discussed in the next subsection 5.2.4 of the study with the perspective of indirect accounting multipliers effect on nominal and real income distribution among institutions.

In contrast, Table 5.8 explains that middle-income households experienced higher indirect accounting multipliers effect in 2002 and 2005. In 2002, these households in rural and urban areas faced by 23.94 percent and 25.04 percent of indirect accounting multipliers effect, respectively. Also, indirect accounting multipliers of these households in rural and urban areas experienced in the amount of 24.59 percent and 29.57 percent in the year 2005. The

76) The calculation of total influence (indirect accounting multipliers effect) is provided in Tables A3.3 and A3.4 of Appendix 3.

highest contributions of indirect accounting multipliers were experienced by middle-income households in rural areas from tertiary sectors by 9.41 percent and by 10.79 percent who live in urban areas in 2002. In 2005, primary sectors provided significant indirect accounting multipliers for these households in rural areas in the amount of 10.99 percent. Moreover, both primary and tertiary sectors provided with the highest indirect accounting multipliers for middle-income households in urban areas by 12.68 percent and 10.58 percent, respectively. This situation indicates that primary sectors played an important role in supporting on the highest indirect accounting multipliers of middle-income households both in rural and urban areas in 2005 when the oil prices increases which were implemented by the government. Since, after increasing oil prices, the prices of agricultural commodities increased together with the prices of other commodities and services which are called cost push inflation. This condition was exploited by particularly middle-income households to achieve the best profit as retail traders (agents) of agricultural commodities. This opportunity is also openly for the other households such the rich. The prototype of indirect accounting multipliers of each institution is provided in the following Table 5.8 for the years 2002 and 2005.

Table 5.8 Indirect Accounting Multipliers Effect on Income Distribution across Institutions by Economic Sectors in Aceh for the years 2002 and 2005 (in percentage)

Institutions	2002						Institutions	2005					
	Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)		Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)
	Primary	Secondary	Tertiary					Primary	Secondary	Tertiary			
HHVPR	1.74	2.24	3.35	7.32	21.8	22.5	*HHVPR*	3.45	2.68	5.74	11.88	21.1	21.7
HHVPU	2.24	3.26	5.05	10.55	13.9	13.8	*HHVPU*	5.49	5.10	9.11	19.71	13.5	13.3
HHPRR	3.07	4.02	6.16	13.26	16.1	14.7	*HHPRR*	6.12	4.93	9.92	20.98	15.6	14.3
HHPRU	2.63	3.84	5.96	12.43	7.9	8.9	*HHPRU*	4.71	4.37	8.24	17.32	7.7	8.6
HHMIR	7.49	7.04	9.41	23.94	11.8	11.1	*HHMIR*	10.99	5.77	7.83	24.59	11.4	10.7
HHMIU	7.52	6.73	10.79	25.04	10.6	10.7	*HHMIU*	12.68	6.31	10.58	29.57	10.2	10.3
HHRR	4.84	6.18	16.62	27.64	8.0	7.0	*HHRR*	7.22	5.54	13.62	26.38	7.7	6.8
HHRU	6.84	6.26	8.49	21.60	6.2	7.4	*HHRU*	11.28	5.89	9.28	26.45	6.0	7.1
HHVRR	5.44	4.38	6.95	16.76	4.0	4.3	*HHVRR*	7.75	3.55	6.88	18.18	3.9	4.1
HHVRU	5.56	5.34	8.31	19.21	3.1	3.1	*HHVRU*	7.53	4.71	12.30	24.54	3.0	3.0
COMPY	79.93	62.80	66.41	209.14			*COMPY*	59.24	33.73	103.95	196.92		
GOVRM	10.11	7.95	8.44	26.50			*GOVRM*	12.65	7.22	22.50	42.37		
M-Total	137.41	120.05	155.93				M-Total	149.12	89.79	219.95			

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers).

- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Subsequently, subsection 5.2.4 of the study is focused more on the impact of oil prices increases on nominal and real income distribution across institutions based on the framework of indirect accounting multipliers effect. Principally, the oil prices increases will affect nominal and real income of institutions through inflation rate. Therefore, in subsection 5.2.4 of the study attempts to capture these correlated effects which are caused by the negative consequences of the increase in oil prices.

5.2.4 Nominal and Real Income Distribution across Institutions of Indirect Accounting Multipliers Effect

Table 5.9 provides nominal and real income distribution across institutions with indirect accounting multiplier effect analysis as a result of the oil prices increases during the years 2002 and 2005. It reports that almost all institutions experienced negative effect as indicated by the reduction of real income of each institution. In this case, the poorest in rural and urban areas as well as the poor in rural areas were not affected indirectly from the negative impact of the oil prices increases as indicated by positive values of real income by 0.000 percent, 0.010 percent, and 0.0001 percent, respectively (see Table 5.9).There are two possibilities that these households were not affected indirectly by the oil prices increases in 2005. First, they possibly not consume large amounts of oil in daily economic activities. If there are, they just use up the oil products in small quantity. Second, they do not pay attention so much to how severe the oil prices increases. This is just a new condition of destiny for their live that they must struggle with extra ability. In reality, they attempt to be optimal in using the potential resources of their family members, reducing leisure, decreasing quantity of consumption or replacing standard foods (i.e. rice) with the other foods (the cheapest prices i.e. cassava) or other possibilities which enable to fulfil their daily home consumption. Thus, if they are able to earn some current money, they will try to save it in little amount for keeping next day consumption. This condition implies that the quality of their living conditions fall under certain threshold level and make them poor and miserable live.

Nevertheless, poor households in urban areas felt a negative impact of the oil prices increases in the amount of 0.009 percent as well as middle-income households both in rural and urban areas were also affected negatively by 0.048 percent and 0.037 percent, respectively. In

addition, the rich in rural and urban reduced real income in the amount of 0.063 percent and -0.029 and the richest households in rural and urban faced the decline in real income by 0.031 percent and 0.022 percent, respectively. Moreover, the firms also experienced the lessening of real income in the amount of 0.485 percent. The structure of nominal and real income distribution across institutions of indirect accounting multipliers effect as a result of oil prices increases in Aceh during the years 2002 and 2005 is provided in Table 5.9.

Table 5.9 Nominal and Real Income Distribution across Institutions of Indirect Accounting Multipliers Effect in Aceh for the years 2002 and 2005

Institutions	N-Effect 2002 (%)	N-Effect 2005 (%)	N-Change (percentage points)	R-Effect 2002 (%)	R-Effect 2005 (%)	R-Change (percentage points)
HHVPR	7.324	11.876	4.551	0.041	0.041	0.000
HHVPU	10.545	19.705	9.160	0.059	0.068	0.010
HHPRR	13.256	20.976	7.720	0.074	0.073	-0.001
HHPRU	12.429	17.316	4.887	0.069	0.060	-0.009
HHMIR	23.945	24.594	0.649	0.134	0.085	-0.048
HHMIU	25.038	29.565	4.528	0.140	0.103	-0.037
HHRPR	27.637	26.379	-1.257	0.154	0.092	-0.063
HHRPU	21.600	26.447	4.847	0.121	0.092	-0.029
HHVRR	16.763	18.176	1.413	0.094	0.063	-0.031
HHVRU	19.213	24.540	5.327	0.107	0.085	-0.022
COMPY	209.144	196.918	-12.226	1.169	0.684	-0.485
GOVRM	26.499	42.369	15.870	0.148	0.147	-0.001

Note: - The computation of indirect nominal and real effects on income distribution across institutions are merely relied on the factor income sources of institutions i.e. formal and informal labour and capital from production activities.
- HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), N-Effect 2002 (Percentage of Nominal income effect 2002), N-Effect 2005 (Percentage of Nominal income effect 2005), N-Change (Nominal income change), R-Effect 2002 (Percentage of Real income effect 2002), R-Effect 2005 (Percentage of Real income effect 2005), and R-Change (Real income change).

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

5.2.5 Global Accounting Multipliers Effect on Income Distribution across Institutions

The effects of the oil prices increases on the income distribution across institutions in Aceh in 2002 and 2005 can be also investigated by using accounting multiplier with reference to global accounting multiplier effect analysis. It attempts to capture direct and indirect accounting multipliers effects in chorus on income distribution among institutions. Thus, the subsection 5.2.5 and 5.2.6 describe the configurations of global accounting multipliers of institutions as well as nominal and real income distribution within global accounting multipliers perspective. Later, in subsection 5.2.5, the global accounting multiplier is decomposed by three main components i.e. transfer, open-loop, and closed-loop effects. Based on the results of global accounting multiplier effect analysis, the firms experienced

bigger accounting multipliers in the amount of 391.76 percent in 2002 and 408.23 percent in 2005 (see Table 5.10). The largest contributions are provided by secondary sectors (163.26 %) and tertiary sectors (131.28%) for the year 2002 and tertiary sectors (158.21%) and secondary sectors (151.94%) for the year 2005. More explicit accounting multipliers of each institution are illustrated in Tables A3.5 and A3.6 (see Appendix 3). Tables A3.5 and A3.6 show that most economic sectors in Aceh contributed large accounting multipliers to the firms in 2002 and 2005. But, some sectors contributed lesser to the firms such as food, beverages, and tobacco industry; textile, leather products, and garment industry; basic steel, steel products, and other industries; government administration, defence, complementary social security sectors; as well as educational, health, and recreational services sectors. This provides fundamental picture that the implementations of the government policies of Aceh frequently provide a significant impact to higher accounting multipliers of the firms through direct and indirect accounting multipliers effect, as previously discussed. Derived from the result of the study, the firms in Aceh play an important role in all of the economic activities. However, the other institutions are associated with smaller global accounting multipliers effect both in 2002 and 2005.

There is an implication of this study that the global accounting multipliers effect on income distribution as reflected by high accounting multipliers of the firms also contribute to government income during the year 2002 reaching 95.60 percent. In this context, this resembles the same story as with direct and indirect accounting multipliers effect. In particular, the majority of economic sectors with large accounting multipliers of the government also promote higher share to the accounting multipliers of the firms. This implies that after firms receive higher income from economic sectors, they in turn, will contribute significant proportion to the government through some tax schemes. There is a positive feedback from the economic activities of the firms to the government. Likewise, the positive impact of the firm's accounting multipliers was also felt by the other households but not as much as the accounting multipliers of the government. The poorest and poor households in urban areas benefited smallest share of global accounting multipliers effect process as shown by the small accounting multipliers of economic sectors. In contrast, the poorest and poor

households in rural areas experienced relatively better impact than the poor in urban areas. Tables A3.5 and A3.6 (see Appendix 3) express detailed result of global accounting multipliers of households in 2002 and 2005. The structure of accounting multipliers of institutions is demonstrated in the following Table 5.10.

Table 5.10 Global Accounting Multipliers Effect on Income Distribution across Institutions by Economic Sectors in Aceh for the years 2002 and 2005 (in percentage)

Institutions	2002						Institutions	2005					
	Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)		Economic Sectors (%)			M-Total (%)	Population (%)	Household (%)
	Primary	Secondary	Tertiary					Primary	Secondary	Tertiary			
HHVPR	12.77	22.90	18.54	54.21	21.8	22.5	*HHVPR*	21.73	35.06	34.62	91.41	21.1	21.7
HHVPU	10.35	18.64	15.25	44.24	13.9	13.8	*HHVPU*	16.59	26.69	26.52	69.80	13.5	13.3
HHPRR	13.66	24.52	20.02	58.20	16.1	14.7	*HHPRR*	19.64	31.46	31.35	82.45	15.6	14.3
HHPRU	8.88	16.02	13.22	38.12	7.9	8.9	*HHPRU*	11.51	18.45	18.51	48.46	7.7	8.6
HHMIR	15.73	27.54	22.48	65.75	11.8	11.1	*HHMIR*	18.77	28.78	28.11	75.66	11.4	10.7
HHMIU	16.11	28.16	23.27	67.54	10.6	10.7	*HHMIU*	19.68	29.93	29.58	79.20	10.2	10.3
HHRR	13.39	23.99	21.09	58.47	8.0	7.0	*HHRR*	15.59	24.69	25.28	65.56	7.7	6.8
HHRU	12.83	22.33	18.28	53.44	6.2	7.4	*HHRU*	16.40	24.89	24.53	65.82	6.0	7.1
HHVRR	9.85	17.02	14.07	40.94	4.0	4.3	*HHVRR*	11.12	16.77	16.72	44.61	3.9	4.1
HHVRU	10.62	18.58	15.40	44.60	3.1	3.1	*HHVRU*	13.33	20.77	21.32	55.42	3.0	3.0
COMPY	97.22	163.26	131.28	391.76			*COMPY*	98.09	151.94	158.21	408.23		
GOVRM	23.21	40.16	32.24	95.60			*GOVRM*	42.67	67.93	68.42	179.02		
M-Total	244.60	423.13	345.14				M-Total	305.13	477.34	483.17			

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers).
- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.
Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Furthermore, global accounting multipliers can be decomposed into three categories: transfer, open-loop, and closed-loop effects[77]. Based on the results of this study the open-loop impacts on the firms' accounting multipliers were also really large around 84.1 percent and the closed-loop effects were 67.3 percent. An examination of these figures explains that the transfer effects were zero, since the pole of injection and the pole of destination ultimately affected in this study were in different accounts (e.g. from production activities to households).

77) Theoretically, once more, the meaning of the transfer effects is to put in a nutshell of the accounting multipliers effect resulted from endogenous accounts in particular cases between institutions and between the inter-industry transfers. The open-loop effects (the cross effects) are to sum up the interactions among and between the three endogenous accounts: production activities, factors (factor income distribution), and institutions (households, firms, and government), while the closed-loop effects ensure that the circular flow of income is completed among endogenous accounts i.e. from production activities to factors to institutions and then back to activities in the form of consumption demand.

Therefore, the values of the transfer effects were indicated by zero. The transfer effects between institutions and institutions as well as economic sectors and economic sectors for the years 2002 and 2005 are illustrated in Table A3.7 (Appendix 3). Moreover, the poorest and the poor in rural areas experience the open-loop effects in the amount of 12.4 percent and 13.1 percent, respectively. There is a crucial point why the poorest and the poor in rural areas influenced by the open-loop effects were greater than the poorest and the poor in urban areas in 2002. The reason is the poorest and the poor in rural areas still have high relationship among the endogenous accounts (production activities, factor income, and institutions), specifically the agricultural sector. According to Tables 2.1 and 2.2 and as illustrated at the previous analysis in chapter 2, the agricultural sector still dominates in contributing to the GRDP of Aceh with a significant share. Consequently, there was as a better opportunity to the poorest and the poor in rural areas compared to those in urban areas. However, the values of closed-loop effects on those households were relatively similar excluding the firms and the government. The general result of open-loop and closed-loop effects on income distribution across institutions based on the decomposition of the global accounting multipliers of each institution for the years 2002 and 2005 is illustrated in the following Tables 5.11 and 5.12.

Table 5.11 Open-Loop and Closed-Loop Effects on Income Distribution across Institutions by Economic Sectors in Aceh for the year 2002 (in percentage)

Institutions	2002						Institutions	2002					
	Open-Loop Effects			M-Total (%)	Population (%)	Household (%)		Closed-Loop Effects			M-Total (%)	Population (%)	Household (%)
	Economic Sectors (%)							Economic Sectors (%)					
	Primary	Secondary	Tertiary					Primary	Secondary	Tertiary			
HHVPR	2.99	5.53	3.85	12.37	21.8	22.5	*HHVPR*	1.84	3.48	2.43	7.74	21.8	22.5
HHVPU	2.37	4.49	3.08	9.94	13.9	13.8	*HHVPU*	1.56	2.93	2.23	6.72	13.9	13.8
HHPRR	3.13	5.93	4.07	13.13	16.1	14.7	*HHPRR*	2.07	3.81	2.87	8.76	16.1	14.7
HHPRU	2.00	3.85	2.62	8.47	7.9	8.9	*HHPRU*	1.40	2.57	2.08	6.06	7.9	8.9
HHMIR	3.41	6.68	4.48	14.57	11.8	11.1	*HHMIR*	2.79	4.38	3.41	10.57	11.8	11.1
HHMIU	3.51	6.87	4.61	15.00	10.6	10.7	*HHMIU*	2.82	4.41	3.64	10.87	10.6	10.7
HHRR	2.98	5.82	3.92	12.71	8.0	7.0	*HHRR*	2.19	3.82	4.12	10.13	8.0	7.0
HHRU	2.75	5.43	3.62	11.81	6.2	7.4	*HHRU*	2.33	3.55	2.82	8.71	6.2	7.4
HHVRR	2.11	4.16	2.77	9.04	4.0	4.3	*HHVRR*	1.81	2.66	2.22	6.70	4.0	4.3
HHVRU	2.29	4.53	3.02	9.84	3.1	3.1	*HHVRU*	1.90	2.94	2.49	7.33	3.1	3.1
COMPY	19.31	39.18	25.59	84.08			*COMPY*	20.58	26.52	20.19	67.29		
GOVRM	5.10	9.59	6.58	21.28			*GOVRM*	4.06	6.30	4.39	14.75		
M-Total	51.95	102.06	68.22				M-Total	45.36	67.36	52.90			

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers).

- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.

Source: Own calculation based on Social Accounting Matrix Data of Aceh in 2002

To examine a distributional income aspect of various groups, the year 2005 can serve as base comparison year. The situation did not change much in the period when the firms captured some advantages from changes in the local government policies. The global effect of the firms amounted to 408.24 percent higher than the previous year 2002. Almost all economic sectors provided bigger share on accounting multipliers of the firms excluding for food, beverages, and tobacco industry; textile, leather products, and garment industry; basic steel, steel products, and others industry; wood and rattan products industry; as well as cement and non-metallic mineral products industry. The open-loop and closed-loop effects of the firms were 89 percent and 65.3 percent in 2005, respectively (see Tables 5.11 and 5.12). In general, the inequality of income distribution of various institution groups still is a serious issue in Aceh, as indicated by different accounting multipliers of each institution. Tables A3.8a, b and A3.9a, b (see Appendix 3) present a detailed depiction of open-loop and closed-loop effects on income distribution across institutions for the years 2002 and 2005. Then, the next subsection 5.2.4 will be more focused on the impact of oil prices increases on nominal and real income distribution across institutions based on global accounting multipliers effect.

Table 5.12 Open-Loop and Closed-Loop Effects on Income Distribution across Institutions by Economic Sectors in Aceh for the year 2005 (in percentage)

Institutions	2005						Institutions	2005					
	Open-Loop Effects			M-Total (%)	Population (%)	Household (%)		Closed-Loop Effects			M-Total (%)	Population (%)	Household (%)
	Economic Sectors (%)							Economic Sectors (%)					
	Primary	Secondary	Tertiary					Primary	Secondary	Tertiary			
HHVPR	5.12	8.89	7.23	21.23	21.1	21.7	*HHVPR*	2.93	5.24	3.86	12.04	21.1	21.7
HHVPU	3.74	6.76	5.28	15.78	13.5	13.3	*HHVPU*	2.52	4.16	3.46	10.13	13.5	13.3
HHPRR	4.44	7.98	6.28	18.70	15.6	14.3	*HHPRR*	2.97	4.85	4.03	11.85	15.6	14.3
HHPRU	2.54	4.68	3.59	10.82	7.7	8.6	*HHPRU*	1.83	2.90	2.61	7.35	7.7	8.6
HHMIR	4.02	7.39	5.67	17.08	11.4	10.7	*HHMIR*	3.37	4.36	3.34	11.07	11.4	10.7
HHMIU	4.16	7.72	5.86	17.75	10.2	10.3	*HHMIU*	3.65	4.50	3.78	11.93	10.2	10.3
HHRR	3.40	6.31	4.80	14.52	7.7	6.8	*HHRR*	2.57	3.79	3.85	10.21	7.7	6.8
HHRU	3.43	6.41	4.83	14.67	6.0	7.1	*HHRU*	3.11	3.78	3.16	10.05	6.0	7.1
HHVRR	2.32	4.34	3.27	9.93	3.9	4.1	*HHVRR*	2.12	2.50	2.23	6.84	3.9	4.1
HHVRU	2.86	5.37	4.04	12.27	3.0	3.0	*HHVRU*	2.31	3.09	3.26	8.65	3.0	3.0
COMPY	20.62	39.17	29.20	88.98			*COMPY*	17.42	22.20	25.70	65.32		
GOVRM	9.36	16.72	13.38	39.46			*GOVRM*	6.81	10.85	9.38	27.04		
M-Total	66.01	121.75	93.43				M-Total	51.61	72.21	68.65			

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers).

- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.

Source: Own calculation based on Social Accounting Matrix Data of Aceh in 2005

5.2.6 Nominal and Real Income Distribution across Institutions of Global Accounting Multipliers Effect

The nominal and real income distribution change derived from the global accounting multiplier effect analysis as a consequence of rising oil prices during the years 2002 and 2005 reports that almost all institutions experienced negative effect as indicated by the reduction of real income of each institution. In this case, only the poorest in rural areas were not affected from the negative impact of the oil prices increases owing to the fact that these households maybe not consume large amounts of oil in daily economic activities. However, the poorest households in urban areas felt a negative impact of the oil prices increases in the amount of 0.005 percent; the poor in rural areas were affected by 0.039 percent; the poor in urban reduced real income amount of 0.045 percent; middle-income households in rural areas amount of 0.105 percent; and in urban areas 0.102 percent. In addition, rich households experienced the negative impact by 0.099 percent and the rich in urban experienced amount of 0.070 percent; the richest in rural and urban get worse by 0.074 percent and 0.057 percent, respectively. Thus, the firms also experienced the reduction of real income in the amount of 0.771 percent. In addition, the results of the study show that middle-class income household both in rural and urban areas were affected by oil prices increases via reduction of real income, which are relatively higher than that of the other institutions, except for the firms. It means that the vulnerability of middle-income households to poverty in Aceh is still relatively high. As a result, the purchasing power of those will worsen. Table 5.13 illustrates global nominal and real effects on income distribution across institutions in Aceh during the years 2002 and 2005.

Furthermore, the comparable results of the empirical study between 2002 and 2005 presents a strong indication that the firms in Aceh had been playing the biggest part in the development process during the years 2002 and 2005. It implies that if the government policies are implemented, it will positively increase the accounting multipliers of the firms. In addition, the highest impact of accounting multipliers of the firms is mainly through global influences compared to the direct and indirect accounting multipliers effect. The large share of benefits of global impact experienced by the firms are due to some adjustments processes of the whole economy such as adjustment in input prices (i.e. cheap labour) together with production

modification in line with sustaining profits in the future. Consequently, the firms are able to achieve the highest profit from the economic production activities. Nevertheless, the adjustment in the economic activities process is inevitable as a result of higher prices in the economy, called spiral inflation. Therefore, in this period the firms also had negative effects of the oil prices increases through higher inflation as shown by real income reduction.

Table 5.13 Nominal and Real Income Distribution across Institutions of Global Accounting Multipliers Effect in Aceh for the years 2002 and 2005

Institutions	N-Effect 2002 (%)	N-Effect 2005 (%)	N-Change (percentage points)	R-Effect 2002 (%)	R-Effect 2005 (%)	R-Change (percentage points)
HHVPR	*54.214*	*91.407*	*37.193*	*0.303*	*0.318*	*0.015*
HHVPU	*44.242*	*69.801*	*25.559*	*0.247*	*0.243*	*-0.005*
HHPRR	*58.198*	*82.450*	*24.252*	*0.325*	*0.287*	*-0.039*
HHPRU	*38.124*	*48.463*	*10.340*	*0.213*	*0.168*	*-0.045*
HHMIR	*65.750*	*75.662*	*9.912*	*0.368*	*0.263*	*-0.105*
HHMIU	*67.535*	*79.196*	*11.660*	*0.378*	*0.275*	*-0.102*
HHRPR	*58.470*	*65.564*	*7.093*	*0.327*	*0.228*	*-0.099*
HHRPU	*53.437*	*65.824*	*12.386*	*0.299*	*0.229*	*-0.070*
HHVRR	*40.936*	*44.606*	*3.671*	*0.229*	*0.155*	*-0.074*
HHVRU	*44.602*	*55.420*	*10.818*	*0.249*	*0.193*	*-0.057*
COMPY	*391.761*	*408.235*	*16.474*	*2.190*	*1.419*	*-0.771*
GOVRM	*95.603*	*179.015*	*83.412*	*0.534*	*0.622*	*0.088*

Note: - The computation of global nominal and real effects on income distribution across institutions are merely relied on the factor income sources of institutions from formal and informal labour and capital.
- HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), N-Effect 2002 (Percentage of Nominal income effect 2002), N-Effect 2005 (Percentage of Nominal income effect 2005), N-Change (Nominal income change), R-Effect 2002 (Percentage of Real income effect 2002), R-Effect 2005 (Percentage of Real income effect 2005), and R-Change (Real income change).

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

By and large, there are some critical points derived from investigation of the aspects of income distribution as indicated by direct, indirect and global accounting multiplier effect analysis; accounting multiplier decomposition analysis; as well as nominal and real income distribution across institutions within the framework of direct, indirect and global accounting multipliers effect. Firstly, the firms always experience higher accounting multipliers effect both in 2002 and 2005 compared to the other institutions, particularly households both in rural or urban areas in Aceh. The higher differences in accounting multipliers of institutions considerably create a higher inequality of income distribution across institutions. To reduce the disparity, therefore, the trickle-down actions are required among institutions in all socio-economic activities through tax and subsidy schemes. Secondly, the nature of linkages mostly promoted the higher accounting multipliers of the various groups of institutions in urban or in

rural areas in Aceh whereas the global accounting multipliers effect were rather larger than direct and indirect accounting multipliers effect. But, the indirect accounting multipliers effect was rather larger than direct accounting multipliers effect to the various groups of institutions in urban or in rural areas. The poorest, poor, and middle-income households will feel the smallest accounting multipliers effect. Thirdly, the general price increase affects the entire economy and the real income of most institutions, particularly poor households whose situation worsens. As a final point, the impact of the rise in oil prices will significantly increase the vulnerability of the households with the middle and lower income level to poverty in Aceh based on the analysis of the real income distribution across institutions.

In fact, the SAM-based model is a deterministic model (see subsection 4.2.2). Therefore, the SAM model is not able to look into the issues of the oil prices increases comprehensively on the poor and the vulnerability of households to poverty. In order to provide a wide-ranging analysis with regard to the impact of rising oil prices on the poor, this study makes use of the CGE model as the third approach. The CGE model is a more powerful model than the SAM-based model because the CGE model is employing the number of non-linear equations together with additional useful information. Hence, the third method employed in the study strengthens two previous analyses through simulating the impact of the oil prices increases on each group of households, especially on the poor in addition to the issues of the vulnerability of households to poverty. To capture all-inclusive impact of rising oil prices on the poor resulting in changes of poor household income, this study simulates several scenarios and concludes based on result comparison with initial year equilibrium.

5.3 The impact of the Oil Prices Increases on the Poor According to Simulations with A CGE Model

This section analyses the shock impact of the oil prices increases on poor households applying the general equilibrium model in which all markets are in general equilibrium. The impact is investigated based on the non-linear programming concept, using GAMS. The non-linear relationship is expected to give more information related to the impact of the oil prices increases stemming from government subsidy reduction on household income, particularly in rural and urban regions in the framework of general equilibrium. Therefore, the general

equilibrium analysis is most important in illustrating features pertaining to the oil price increases by comparing two sets of SAM data from the years 2002 and 2005. Comparing two types of SAM data in the context of general equilibrium model provides insight into the impact of the government policies of the oil prices increases on household income both in urban and rural areas and generally on the whole of economy of Aceh. For that reason, at the beginning of this section the condition of household income in Aceh in general equilibrium pattern both for the years 2002 and 2005 is investigated. Moreover, the study uses several different scenarios to simulate the impact of oil prices increases on household income with focus more on the poorest, poor, and middle-income households. These simulations are expected to provide the government policies with respect to the accurate responses related to the oil prices increases on the whole economy of Aceh and particularly the equality of institution income distribution.

5.3.1 Household Income Structure and Economic Performance of Aceh

Table 5.14 shows the comparison of household incomes between the years 2002 and 2005 based on the general equilibrium model by using two SAM data sets. The preliminary results illustrate that the economy of Aceh had experienced a drastic transformation during the periods 2002 and 2005 as reflected by structural change of the household income. The urban and rural household income in 2005 increased as compared to the year 2002, especially those at the upper middle-income level. In 2005, however, the income of the poorest households in urban areas and poor households both in rural and urban areas diminished considerably in the amount of 0.0969, 0.4901, and 1.1580 billion Rupiah, respectively. This implies that the economic conditions of these households worsened during that time or the vulnerability level of those to poverty increased as a result of rising oil prices (see subsection 5.3.2 and 5.3.3). In this case, they had a risky probability to be overtly involved in chronic poverty. In turn, their income reduction would negatively affect them by lowering consumption rate as compared to the other households such as the middle-income, the rich, and the richest households. As a result, the poorest in urban areas and the poor in rural and urban areas attempted to keep up a certain level of their consumption by using last saving as indicated by the values of saving decline of approximately 1.3303, 1.8898, and 1.8489 billion Rupiah, respectively. This

condition indicates that there is a consumption behaviour of these households on the next phase through attempting to maintain at lower consumption expenditure at the moment which aimed to save some money at substandard levels as a guarantee for the additional consumption in the future[78]. Implicitly, this action points out that the quality of living conditions of these households is getting worse in this period.

The further outlook, the poorest households in rural areas suffered the worst as compared with the other three groups of households discussed previously. Although their income relatively increased in 2005 by 2.5554 billion Rupiah (i.e. owing to the government oil compensation programs in addition to the earthquake and tsunami catastrophe relief), that increase of income was simultaneously accompanied by higher consumption spending 2.1976 billion Rupiah. Nevertheless, the poorest households in rural areas were still able to save little money in a short time in the amount of 0.3578 billion Rupiah[79]. This implies that the impact of the increase in oil prices indirectly affected the poorest through higher inflation rate at the end of the shock period, even though the rural poorest' dependence on oil consumption was low. Perhaps, only a little amount of kerosene was required to support their daily home activities. Hence, the poorest households in rural areas have a positive value of saving by 0.3578 billion Rupiah in 2005. In conclusion, if the oil prices increases are implemented by the government, the rural poorest will indirectly suffer from increasing oil prices through higher inflation rate. This condition is indicated in Table 5.14 that rising income of the poorest households in rural areas will be used up in equal amounts of the increase in consumption expenditure (money illusion[80]). Implicitly, the poorest households in rural areas still remained in the chronic poverty condition.

78) They try to be optimal in using the potential resources of their family including child labour, reducing leisure for additional works, and other possibilities.

79) They are usually involved in coolie labour. Coolie labour refers to their time (work) which is compensated by the lowest wage and they usually get food and drink per day of work. In daily life of poor rural households, they try to use less of their factor income on consuming food which it can be easily obtained from the agricultural sector such as cassava and others.

80) There is no adjustment of the expected price level (the expected real wage) as the actual price level changes as a result of the oil prices increases.

In addition, households in the middle-income class in urban areas faced a better economic situation in 2005. Their income increased by 1.3932 billion Rupiah and that of rural middle-income households by 0.5483 billion Rupiah. Nevertheless, the increase in consumption expenditure of these households in urban areas was higher than the income growth in the amount of 3.0716 billion Rupiah. Consequently, saving of middle-income households in urban areas decreased by 1.6783 billion Rupiah. This means that their consumption spending sharply rose probably as a consequence of higher living costs, high mobility and economic activities, and higher needs for education of the children. There is an indication that most of urban middle-income households are at productive age and highly economic active. Therefore, a higher increase of consumption expense than the income level of urban middle-income households which was affected by oil prices increases reduced concurrently their saving by 1.6783 billion Rupiah.

Table 5.14 Income and Expenditures of Households in Aceh According to General Equilibrium Model by Using SAM Data in 2002 and 2005

HOUSEHOLDS	2002			2005			Change in 2005 to 2002		
	HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving
	Billion Rupiah			Billion Rupiah			Change (Billion Rupiah)		
HHVPR	4.1209	3.6356	0.4853	6.6762	5.8332	0.8430	2.5554	2.1976	0.3578
HHVPU	5.1788	3.0954	2.0834	5.0819	4.3288	0.7530	-0.0969	1.2334	-1.3303
HHPRR	6.3647	3.5480	2.8167	5.8746	4.9478	0.9268	-0.4901	1.3997	-1.8898
HHPRU	5.0487	2.4692	2.5796	3.8907	3.1601	0.7306	-1.1580	0.6909	-1.8489
HHMIR	5.2970	3.2947	2.0023	5.8453	4.7612	1.0841	0.5483	1.4665	-0.9181
HHMIU	5.1043	2.3124	2.7919	6.4976	5.3840	1.1136	1.3932	3.0716	-1.6783
HHRR	4.1379	2.2549	1.8830	5.0677	3.9316	1.1361	0.9298	1.6768	-0.7469
HHRU	3.6879	2.1948	1.4931	5.5560	4.3366	1.2194	1.8681	2.1418	-0.2737
HHVRR	2.9238	2.1227	0.8011	4.2700	3.2464	1.0236	1.3462	1.1237	0.2225
HHVRU	2.6748	2.0016	0.6733	4.9343	3.6905	1.2438	2.2595	1.6890	0.5705
FACTORS	FME	EcowideW	FINC	FME	EcowideW	FINC	FME	EcowideW	FINC
FORML	473.9600	0.0120	7.2980	512.2400	0.0260	13.9350	38.2800	0.0140	6.6370
INFORML	1014.9400	0.0090	8.3770	1113.0800	0.0180	19.0760	98.1400	0.0090	10.6990
CAPFP	17.7670	1.3310	23.6490	35.5670	1.9790	70.3820	17.8000	0.6480	46.7330
GOVERNMENT	YG	EG	GSAV	YG	EG	GSAV	YG	EG	GSAV
	3.9600	6.8160	-2.8570	10.7810	10.9950	-0.2130	6.8210	4.1790	2.6440

Note: -HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), FORML (Formal labour), INFORML (Informal Labour), CAPFP (Capital), HHINC (Household income), HHCON (Household consumption expenditure), MPS (Marginal propensity to save), FME (Factor market equilibrium stands for demand for factor f is equal to supply of factor f), EcowideW (The economy-wide wage (rent) or factor prices of factor f), FINC (Factor income f), YG (Government income), EG (Government expenditure), GSAV (Government saving).

Source: Own calculation based on the CGE model by using SAM data for the years 2002 and 2005

Moreover, the richest households in rural and urban areas constituted the households who benefited during this period as indicated by the positive levels of saving in the amount of 0.2225 billion Rupiah for the richest rural households and 0.5705 billion Rupiah for the richest urban households. The high saving level was fuelled by their income rise which amounted to 1.3462 billion Rupiah and 2.2595 billion Rupiah, respectively. This is, in spite of their consumption spending increased in the amount of 1.1237 billion Rupiah for the rural richest and 1.6890 billion Rupiah for the urban richest. In general, the results of this study employing general equilibrium model signifies that the economic situation of Aceh in this period pointed to a high inequality of income distribution between the highest and the lowest income level in urban and rural areas as indicated by different impact incidence of oil price shock experienced by each income group in society.

In general, saving level of the rural households excluding the richest households in rural and urban regions became moderately worse in 2005 compared to saving level of ones in urban areas. These different saving performances describe that the impact of the oil prices increases impinged on certain income levels of households, particularly in rural regions. As a result, consumption expenditure of households in rural areas increased high enough at certain income level compared to those in urban areas. There is a strong indication that the prototype of consumption behaviour between poor and rich households, especially in urban areas were different from each other in which poor households use up a larger proportion of their income on goods and services than rich households did. The largest income attained by poor households is normally consumed in non-productive activities. In contrast, rich households used their incomes in productive activities such as capital investment, which can create larger opportunity of accounting multipliers. In the context of macroeconomics view, therefore, accounting multipliers of rich households, particularly in urban regions will be higher than poor households in the next periods. The characteristic behaviour of higher consumption expenditure and invariable income (smaller income increase) of the poor highly has an effect on generating a diminutive saving level. In other words, this indicates an impossible situation for the poor to release themselves from poverty trap. Hence, high level of poverty still remains in Aceh.

The pattern of households' saving both in rural and urban regions had varied appearances throughout the years 2002 and 2005. In 2002, the saving prototype of households had relatively indistinguishable characteristics in terms of saving behaviour of households in rural and urban areas. In the year 2005, on the contrary, household-saving behaviour involving the households in rural and urban areas showed a different picture. The saving performance of the richest households both in rural and urban regions significantly increased and the other households both in rural and urban regions significantly decreased (see Table 5.14). But, the saving level of the richest households in urban areas was higher than the richest rural households. It is worth noting that the role and frequency of economic activities stream are quiet concentrated mostly in urban areas, which has a big capital formation compared to rural areas. As a result, the richest in urban regions have been taking delivery of positive consequences with privileged accounting multipliers as compared to the richest rural households. Consequently, this condition automatically affected high saving level of the richest household in 2005 even though the oil prices increases influenced the whole economy of Aceh in this year. In contrast, the other households who have relatively small capital structure both in rural and in urban regions will not be able to compete with the richest households, particularly the richest in urban areas, in the economy.

Furthermore, the improvement of household income in 2005 was simultaneously followed by the contradictory policies from the government such as swelling oil prices in conjunction with cutting oil subsidy on March, 1st and October, 1st 2005. The consequences of increased oil prices have induced the economy to adjust with a new economic equilibrium, particularly a new wage scheme. In turn, the government actions on increasing oil prices immediately lead to prices rise at a higher level which is called spiral inflation. This is because an increase in oil prices will induce higher prices and afterwards it is followed by a new wage scheme. In reality, the implementation of a new wage level will bring about another new price level in the economy. In view of that, the expansion of household income in 2005 merely constituted the nominal income growth but not directly expressed the appreciation of real income of households. It gives impression that the soaring real income of households did not seriously increase as much as the nominal income growth (wage-price spiral). This was indicated by

negative performance of saving level of households both in urban and rural areas, excluding neither the richest rural households nor the richest urban households.

An increase in societal income at a certain level for the year 2005 compared to the year 2002 constituted a pseudo income growth. It illustrates that the increase of nominal income of households is strongly provoked by wage rate growth. Nevertheless, the wage gain is usually lower than the increase of commodity prices or inflation rate. As a result, the household real income falls drastically at the same time. This situation was signified by the realistic saving reduction of households. A worse-off income was genuinely experienced by the households who dwell in rural areas as indicated by the saving value reduction severely compared to the saving value of those who live in urban areas. A huge dissimilarity of saving values was affected by higher disparities of the structure of economic activities and forcefulness among households. Accordingly, the income characteristic of households in rural areas is more stationary than those in urban areas. A reduction of the saving rate becomes an important benchmark to show the factual picture of the economic conditions of households. Increasing income at a certain level experienced by households is frequently pursued by higher consumption expenditure through higher inflation rate. Hence, the nominal income of households will depreciate at certain levels owing to higher inflation rise as indicated by concurrently rising consumption expenditure rate of households. This means that the real income of certain households turns out lowering purchasing power levels.

Besides, the prototype of household income in Aceh during the year 2002 shows that the factor supply and demand of informal and formal labour derived from the factor market was 1014.9400 billion Rupiah and 473.9600 billion Rupiah, respectively. Moreover, the capital in the factor market equilibrium was 17.7670 billion Rupiah. In keeping with the number of factor inputs supply and demand in 2002, the study illustrates that the number of informal and formal labour at the factor market equilibrium experienced a significant increase in 2005 compared to their factor inputs in the year 2002. In 2005, it reached approximately 1113.0800 billion Rupiah with an increase of 98.1400 billion Rupiah over 2002 for informal labour. For formal labour in 2005 it was 512.2400 billion Rupiah implying a change over 2002 of around 38.2800 billion Rupiah. For the year 2005, the capital resource at factor market equilibrium

increased two times reaching 35.5670 billion Rupiah from 17.7670 billion Rupiah in 2002 with the change of about 17.8000 billion Rupiah (see Table 5.14).

In connection with the picture of factor inputs market, the study shows that the factor capital in the market experienced the highest gain compared to the other factor inputs; i.e. informal and formal labour. This was generated by the different accounting multipliers among them. It is indicated by the increase in factor income of capital from 23.6490 billion Rupiah in 2002 to 70.3820 billion Rupiah in 2005 with a significant change by 46.7330 billion Rupiah. Informal labour income amounted to around 8.3770 billion Rupiah in 2002 and 19.0760 billion Rupiah in 2005, indicating a significant increase by 10.6990 billion Rupiah over the period of 2002-2005. In addition, formal labour income was 7.2980 billion Rupiah in 2002 which increased to 13.9350 billion Rupiah in 2005, showing a change of 6.6370 billion Rupiah. The huge differences in factor income sources among capital, informal labour and formal labour were affected predominantly by the diverse economy-wide wage (rent) or factor prices of labour and capital. Consequently, this induced a greater gap among the role of informal labour, formal labour and capital factor on the whole economy of Aceh. Therefore, Aceh thoroughly requires appropriate courses of actions to generate equality of opportunity between the role of labour intensive and capital intensive standpoints along with the determination of the appropriate standard compensation for factors, especially labour factors (real wage scheme) in the development process. It is aimed at reducing a huge gap among the households who have labour factors and who have capital factors as production input.

In addition, Table 5.14 presents the development of government revenue and expenditure of Aceh for the period of 2002 and 2005. In 2002, government revenue experienced a smaller achievement in the amount of 3.9600 billion Rupiah than government expenditure by 6.8160 billion Rupiah. The impact of the differences of government revenue and expenditure has generated a big hole on government saving around 2.8570 billion Rupiah. In contrast, in 2005, government revenue increased sharply up to 10.7810 billion Rupiah with government revenue change reaching 6.8210 billion Rupiah. This was followed by small increase of government expenditure around 10.9950 billion Rupiah with government expenditure change by 4.1790

billion Rupiah. As a result, the local government of Aceh experienced an increase in saving approximately 2.6440 billion Rupiah. An increase of the amount of government saving in the year 2005 has generated a significant reduction of the local government budget deficit compared to government deficit in 2002. The budget deficit of the local government in 2005 reached 0.2130 billion Rupiah.

There is a considerable change of government revenue and expenditure in the year 2005. This has been caused by a new political and economic scheme in Aceh, particularly after the Indonesian government launched the Law No. 22/1999 concerning regional autonomy and the Law No. 25/1999 in relation to financial sharing between the central and local governments. This condition has also been complemented by inaugurating the Law No. 18/2001 with reference to special autonomy of Aceh. The effect of these laws has been straightforwardly invigorating regional financial share of Aceh which sharply increased as shown in Table 5.14. This situation gives a positive impact on government fiscal revenue. A favourable condition of a new political and economic scheme of Aceh was also supported by the implementation of Memorandum of Understanding (MoU) between the central government of Indonesia and Aceh Separatist Movement (GAM) in Helsinky on August 15, 2005. In a while, it becomes a fundamental agreement on giving a self-motivated autonomy as strengthened by means of Law No.11/2006 in respect to Aceh Provincial Administration which systematically replaced the position of Law No.18/2001. The existence of Law No. 11/2006 has necessarily transformed the sovereignty of the Aceh government in essential aspects, particularly in organizing political and economic standpoints based on the cultural and socio-economic dimensions of Aceh.

In general, the role of new political and economic conditions of Aceh has been reasonably picking up the pace of the local government revenue and expenditure toward a significant improvement. Unfortunately, a new political and economic advance does not strongly generate in the direction of better economic structure base of Aceh (i.e. generating strong inter-linkages of economic sectors in Aceh) and the equality of income distribution between the highest income level and the lowest income level. Thus, until now, Aceh still faces a big

gap between the agricultural and industrial sectors in conjunction with the inequality of income distribution across households between the poor and the rich. The huge disparities in income distribution among households in Aceh constitute a critical problem which induces the poverty rate in this region significantly. Moreover, it becomes a higher and higher level as strengthened by the number of the poor (chronic poverty) along with the vulnerable households gets more and more, if some economic shocks (i.e. the implementation of increasing oil prices as a consequence of the oil subsidy reduction) emerge to the surface of the economy of Aceh.

The economic performance of Aceh during the years 2002 and 2005 is represented by Table 5.15. Manufacturing industries; agricultural sector; and mining and quarrying sectors in Aceh contributed remarkably in domestic activities recording 16.5779 billion Rupiah, 10.6886 billion Rupiah, and 7.5710 billion Rupiah compared to the other economic sectors for the period 2002, respectively. Moreover, in 2005, agricultural sector played an important role in contributing its share to the economy of Aceh in the amount of 19.2727 billion Rupiah (80.31%) compared with manufacturing sectors and mining and quarrying sectors. This economic performance indicates that the agricultural sector still takes part in affecting positively the whole economy of Aceh (see also Tables 2.1 and 2.2 in chapter 2 of this study). On the contrary, the electricity and water supply sector in company with the financial, real estate, and business services sector performed poorly during the years 2002 and 2005 approximately 0.49 billion Rupiah (54.62%) and 0.19 billion Rupiah (11.41%), respectively. Table 5.15 illustrates the performance of the economy of Aceh for the years 2002 and 2005.

Table 5.15 Economic Performance of Aceh by Economic Sectors in 2002 and 2005

Economic sectors	2002	2005	Change (Billion Rupiah)	% change
	Billion Rupiah			
1. Agriculture, Livestock, Forestry & Fishery	10.6886	19.2727	8.58	80.31
2. Mining & Quarrying	7.5710	12.5564	4.99	65.85
3. Manufacturing Industries	16.5779	17.6420	1.06	6.42
4. Electricity & Water Supply	0.8900	0.4038	-0.49	-54.62
5. Construction	2.1577	7.7877	5.63	260.93
6.Trade, Hotel & Restaurant	0.3503	1.4133	1.06	303.46
7. Transportation & Communication	2.0218	3.7071	1.69	83.36
8. Financing, Real estate,& Business Services	1.6412	1.4539	-0.19	-11.41
9. Services	1.1940	6.5465	5.35	448.28

Source: Own calculation based on the CGE model by using SAM data for the years 2002 and 2005

The lessening of domestically economic activities in Aceh during the year 2005, in particular the electricity and water supply sectors as well as the financial, real estate, and business services sectors, was affected by the execution of the oil prices increases as a result of the cutting of subsidies in oil of that year by the government. In this case, the electricity and water supply sector experienced a considerably negative effect of the oil prices increases. Besides, this situation was faced by the financial, real estate, and business services sectors. The increase in oil prices at a certain level has the tendency to substantial increase inflation rate at the same time reducing the purchasing power of the households as indicated by real income decrease. Consequently, the willingness of certain society in holding cash money or in assets is higher than keeping money in financial sector, real estate, and business services for fulfilling a guaranteed level of consumption. Alternatively, those who had a higher capability of saving undertook to look for the other economic activities which enabled them to create the highest possibility of sustained profits such as agricultural sector. Therefore, the performance of agricultural sector in 2005 was as an optimistic sector in providing the best opportunity for the economy of Aceh. In contrast, the electricity and water supply sectors plus the financial, real estate, and business services sectors had drastically experienced an off-putting upshot of the oil prices increases in 2005.

The specific issues are addressed in the following subsection 5.3.2 which focuses on simulating the phenomena of oil prices increases on the poor through implementing some scenarios with the CGE-based model. The main purposes of this subsection are to summarize a reaction of the poor in facing the impact of oil prices increases. Besides, the government actions by means of oil price compensation to the poor are investigated as well by this subsection. Furthermore, subsection 5.3.3 attempts to capture the other important issues relating to the vulnerability of households to poverty as negative consequences of oil prices increases.

5.3.2 Simulations of Increasing Oil Prices and Poverty

In order to capture the effects of a shock of increasing oil prices on household income with regards to poverty, this study relies strongly on some simulations using a general equilibrium

model. Table 5.16a corresponds to the realistic conditions anchored in some scenarios of the impact of the oil prices increases on the poor. Generally, these increases had a negative impact on rural and urban household income. The first scenario will emphasize on increasing oil prices of gasoline and diesel by 32.6 percent and 27.3 percent, respectively. The effect of this scenario illustrates that the poorest households in rural areas experienced an increase of income in the amount of 0.0075 billion Rupiah. Unfortunately, the rural poorest faced a quite equal amount of consumption expenditure increase by 0.0065 billion Rupiah. This demonstrates that the rural poorest in Aceh were definitely trapped into absolute poverty even though they experienced a positive saving value of income 0.0009 billion Rupiah. The impact on absolute poverty is strongly indicated by the fact that the entire income is spent for the consumption. Therefore, increasing oil prices which are due to government policy actions will highly deteriorate the economic conditions of these households to be trapped into chronic poverty as strengthened by the purchasing power reduction of households drastically.

The second scenario depicts the impacts of an increase of kerosene price by 185.7 percent, gasoline price by 87.5 percent and diesel price by 104.8 percent. The results show that the income level of the poorest households in rural areas got worse which reached 0.0034 billion Rupiah with a quite similar amount of consumption expenditure change of 0.0030 billion Rupiah. In spite of this, the saving value of the poorest rural households remained positive 0.0004 billion Rupiah. This situation explains that the poorest rural households would be severely affected by increasing oil prices as a result of cutting kerosene subsidy by the government in 2005. In other words, the poorest rural households faced double impact of the oil prices increases, which can be precisely explored. At the first phase, they will be directly influenced by kerosene subsidy reduction which generated kerosene price increases; and in the second phase, they are indirectly affected by higher prices of other commodities brought about by the oil prices increases. In rural areas, the poorest are usually involved in unskilled farm labour and "coolie labour[81]". So, when the oil prices increase, their wages also tend to rise due to the government compensation of the oil prices increases. This was indicated by a positive saving value around 0.0004 billion Rupiah. Unfortunately, an increase in their

[81] Coolie labour refers to their time (work) which is compensated by the lowest wage and they usually get food and drink per day of work.

income actually did not generate an increase in their real income level. But, it just increased the nominal income because the inflation rate also went up significantly more than the growth of nominal income level. Subsequently, this situation purely constitutes a pseudo income effect which was experienced by the poorest households in rural areas.

The same experience was made by the poorest urban households as well as rural and poor urban households. Their income was also significantly reduced. The poorest households in urban areas suffered from a 0.2695 billion Rupiah decline compared to the first scenario of the oil prices increases and the rural and urban households from a 0.1853 billion Rupiah and 0.3014 billion Rupiah reduction, respectively. As far as the second scenario is concerned, these three household groups faced an even stronger income cut by those oil prices increases; 0.2732, 0.1892, and 0.3043 billion Rupiah, respectively. Despite the option of using gasoline and diesel to support their daily activities, it was not used as extensively as other households such as the richest, the rich, and middle-income ones did. However, there is a probability to consume kerosene as a prominent input of daily home activities of these households. Therefore, they directly experienced the income drop in 2005 as a consequence of the oil prices increases and suffered more from increasing oil prices with the subsidy reduction on kerosene price in 2005. Regrettably, these households were also indirectly affected by higher inflation rate as a result of the oil prices rises as strongly indicated by their income reduction for the year 2005 (see Table 5.14).

Additionally, rural and urban middle-income households suffered even more from the oil prices rises than the poorest and poor ones both in rural and urban areas. Their income was reduced by 0.3952 and 0.5806 billion Rupiah as compared to the first scenario and even slightly more in relation to the second scenario; i.e. by 0.3994 billion Rupiah and 0.5856 billion Rupiah, respectively. Nevertheless, rural and urban middle-income households easily became accustomed to higher price changes as a result of the negative oil prices increase. This situation was indicated by the encouraging income change in the amount of 0.5483 billion Rupiah and 1.3932 billion Rupiah in spite of their saving, which tended to decrease significantly (see Table 5.14), especially for urban middle-income households. It declined by 1.6783 billion Rupiah compared to rural middle-income households with only 0.9181 billion

Rupiah. The prototype of the detailed impact of the oil prices increases on the household income in Aceh during the year 2005 is illustrated in Tables 5.16a and 5.16b.

Table 5.16a Income and Expenditures of Households in Aceh in the Year 2005 as Basis and Their Changes due to Scenario Simulations of Various Oil Prices Increases Using SAM Data of 2005

HOUSEHOLDS	Base values in 2005			Simulations using SAM Data of 2005								
	HHINC	HHCON	Saving	Scenario 1			Scenario 2			Scenario 3		
				HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving
	Billion Rupiah			Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)		
HHVPR	6.6760	5.8330	0.8430	0.0075	0.0065	0.0009	0.0034	0.0030	0.0004	-0.7569	-0.6613	-0.0956
HHVPU	5.0820	4.3290	0.7530	-0.2695	-0.2296	-0.0399	-0.2732	-0.2327	-0.0405	-1.0635	-0.9059	-0.1576
HHPRR	5.8750	4.9480	0.9268	-0.1853	-0.1561	-0.0292	-0.1892	-0.1593	-0.0298	-0.7784	-0.6556	-0.1228
HHPRU	3.8910	3.1600	0.7306	-0.3014	-0.2448	-0.0566	-0.3043	-0.2472	-0.0571	-0.6854	-0.5567	-0.1287
HHMIR	5.8450	4.7610	1.0841	-0.3952	-0.3219	-0.0733	-0.3994	-0.3253	-0.0741	-0.1323	-0.1078	-0.0245
HHMIU	6.4980	5.3840	1.1136	-0.5806	-0.4811	-0.0995	-0.5856	-0.4852	-0.1004	-0.0212	-0.0175	-0.0036
HHRR	5.0680	3.9320	1.1361	-0.5039	-0.3910	-0.1130	-0.5080	-0.3941	-0.1139	-0.9106	-0.7065	-0.2042
HHRU	5.5560	4.3370	1.2194	-0.5606	-0.4375	-0.1230	-0.5650	-0.4410	-0.1240	-0.3458	-0.2699	-0.0759
HHVRR	4.2700	3.2460	1.0236	-0.4359	-0.3314	-0.1045	-0.4393	-0.3340	-0.1053	-0.1515	-0.1152	-0.0363
HHVRU	4.9340	3.6910	1.2438	-0.7102	-0.5312	-0.1790	-0.7145	-0.5344	-0.1801	-1.1643	-0.8708	-0.2935
FACTORS	FME-2005			FME-Scenario 1			FME-Scenario 2			FME-Scenario 3		
FORML	512.2400			0.0000			0.0000			0.0000		
INFORML	1113.0800			0.0000			0.0000			0.0000		
CAPFP	35.5670			0.0000			0.0000			0.0000		
	EcowideW-2005			EcowideW-Scenario 1			EcowideW-Scenario 2			EcowideW-Scenario 3		
FORML	0.0260			-0.0011			-0.0011			-0.0119		
INFORML	0.0180			0.0008			0.0008			0.0037		
CAPFP	1.9790			-0.0055			-0.0068			-0.4609		
	FINC-2005			FINC-Scenario 1			FINC-Scenario 2			FINC-Scenario 3		
FORML	13.9350			-0.3382			-0.3477			-4.5063		
INFORML	19.0760			0.7094			0.6984			6.1878		
CAPFP	70.3820			-0.1941			-0.2434			-16.3945		
GOVERNMENT	YG-2005			YG-Scenario 1			YG-Scenario 2			YG-Scenario 3		
GOVERN-Y	*10.7810*			*1.4372*			*1.4369*			*-2.2464*		
GOVERN-E	EG-2005			EG-Scenario 1			EG-Scenario 2			EG-Scenario 3		
	10.9950			9.5327			9.5327			3.3795		
GOVERN-SAV	SAVG-2005			SAVG-Scenario 1			SAVG-Scenario 2			SAVG-Scenario 3		
	-0.2130			-8.0956			-8.0958			-5.6259		

Note: -HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), FORML (Formal labour), INFORML (Informal Labour), CAPFP (Capital), HHINC (Household income), HHCON (Household consumption expenditure), MPS (Marginal propensity to save), FME (Factor market equilibrium stands for demand for factor f is equal to supply of factor f), EcowideW (The economy-wide wage (rent) or factor prices of factor f), FINC (Factor income f), YG (Government income), EG (Government expenditure), GSAV (Government saving).

- Scenario 1 based on the oil prices increases comprised Gasoline price (32.6%), Diesel price (27.3%), Kerosene price (0%); Scenario 2 based on the oil prices increases consisted of Gasoline price (87.5%), Diesel price (104.8%), Kerosene price (185.7%); Scenario 3 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%).

Source: Own calculation based on the CGE model by using SAM data in 2005

It is important to note from Table 5.16a that the spiralling of oil prices affected the income of the richest and rich households in urban regions compared with those who dwell in rural

areas. The income of the richest households in rural and urban areas were also negatively influenced by oil prices increases in the amount of 0.4359 billion Rupiah and 0.7102 billion Rupiah founded on the first scenario, respectively. Moreover, their income declined in the amount of 0.4393 billion Rupiah and 0.7145 billion Rupiah anchored in the second scenario, respectively. However, rich households in rural and urban areas directly experienced a little bit lower impact than the richest households both in rural and urban areas, about -0.5039 billion Rupiah and 0.5606 billion Rupiah based on the first scenario. Additionally, according to the second scenario, income reductions of these households were around 0.5080 billion Rupiah and 0.5650 billion Rupiah, respectively. This indicates that the richest and rich households in urban areas had an excessive dependency rate in consuming oil products, but they are, in turn, easily get used to the negative impact of the oil prices increases.

In reality, the richest and rich households in urban areas have the ability to accustom themselves quickly towards the abrupt changes of oil prices as these households possess the productive capital that is relatively higher and in a position to access perfect information with regards to the policy changes compared to those who live in rural areas. Afterwards, they straightforwardly sustain and get used to the vigorous changes in development process, particularly such as the increase in oil prices as indicated by positive values of their saving level. In this case, the urban richest households experienced the positive saving value by 0.5705 billion Rupiah and urban rich households faced a negative small saving by approximately 0.2737 billion Rupiah (see Table 5.14). The richest households in rural areas, however, experienced relatively small saving reaching 0.2225 billion Rupiah compared to the urban richest households. But, rich households in rural areas faced a significant negative saving, which reached 0.7469 billion Rupiah compared to rich households in urban areas. On the whole, the pattern of simulations analysis relating to the impact of the oil prices increases considerably encroached on dropping real income of rich and poor households in Aceh both in rural and urban regions. Likewise, the largest negative effect of the oil prices increases was generated partially by the second scenario in which kerosene price increase was included in simulations as compared to the first scenario.

Table 5.16b The Changes of Poor Households' Income and Expenditure in Aceh due to Receiving Government Transfers in Comparison to the Base Situation in 2005 According to Simulation Results by Using SAM Data of 2005

HOUSEHOLDS	Simulations using SAM Data of 2005											
	Scenario 4			Scenario 5			Scenario 6			Scenario 7		
	HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving
	Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)		
HHVPR	1.6573	1.4480	0.2093	-0.4456	-0.3893	-0.0563	-0.1342	-0.1173	-0.0170	2.222	1.942	0.281
HHVPU	0.4798	0.4087	0.0711	-0.9392	-0.8000	-0.1392	-0.8148	-0.6941	-0.1207	0.693	0.591	0.103
HHPRR	0.7553	0.6362	0.1192	-0.5584	-0.4703	-0.0881	-0.3384	-0.2850	-0.0534	1.149	0.968	0.181
HHPRU	-0.1123	-0.0912	-0.0211	-0.6145	-0.4991	-0.1154	-0.5436	-0.4415	-0.1021	0.006	0.005	0.001
HHMIR	-0.5547	-0.4519	-0.1029	-0.1062	-0.0865	-0.0197	-0.0800	-0.0652	-0.0148	-0.540	-0.440	-0.100
HHMIU	-1.2599	-1.0440	-0.2159	0.0047	0.0039	0.0008	0.0305	0.0253	0.0052	-1.246	-1.032	-0.214
HHRR	-0.5891	-0.4570	-0.1321	-0.8874	-0.6885	-0.1989	-0.8642	-0.6705	-0.1937	-0.569	-0.441	-0.128
HHRU	-1.1213	-0.8752	-0.2461	-0.3243	-0.2531	-0.0712	-0.3027	-0.2362	-0.0664	-1.107	-0.864	-0.243
HHVRR	-0.9633	-0.7324	-0.2309	-0.1351	-0.1027	-0.0324	-0.1188	-0.0903	-0.0285	-0.952	-0.723	-0.228
HHVRU	-1.3188	-0.9864	-0.3324	-1.1479	-0.8585	-0.2893	-1.1314	-0.8462	-0.2852	-1.298	-0.971	-0.327
FACTORS	FME-Scenario 4			FME-Scenario 5			FME-Scenario 6			FME-Scenario 7		
FORML	0.0000			0.0000			0.0000			0.0000		
INFORML	0.0000			0.0000			0.0000			0.0000		
CAPFP	0.0000			0.0000			0.0000			0.0000		
	EcowideW-Scenario 4			EcowideW-Scenario 5			EcowideW-Scenario 6			EcowideW-Scenario 7		
FORML	0.0039			-0.01163			-0.011			0.0041		
INFORML	0.0016			0.0037			0.004			0.0015		
CAPFP	0.6444			-0.45611			-0.451			0.6383		
	FINC-Scenario 4			FINC-Scenario 5			FINC-Scenario 6			FINC-Scenario 7		
FORML	4.2629			-4.42625			-4.346			4.2843		
INFORML	2.3350			6.250854			6.314			2.2280		
CAPFP	22.9211			-16.2226			-16.051			22.7036		
GOVRNMENT	YG-Scenario 4			YG-Scenario 5			YG-Scenario 6			YG-Scenario 7		
GOVERN-Y	1.4394			-2.2430			-2.2394			1.9692		
GOVERN-E	EG-Scenario 4			EG-Scenario 5			EG-Scenario 6			EG-Scenario 7		
	9.5352			3.4200			3.4604			10.3418		
GOVERN-SAV	SAVG-Scenario 4			SAVG-Scenario 5			SAVG-Scenario 6			SAVG-Scenario 7		
	-8.0958			-5.6630			-5.6998			-8.3726		

Note: -HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), FORML (Formal labour), INFORML (Informal Labour), CAPFP (Capital), HHINC (Household income), HHCON (Household consumption expenditure), MPS (Marginal propensity to save), FME (Factor market equilibrium stands for demand for factor f is equal to supply of factor f), EcowideW (The economy-wide wage (rent) or factor prices of factor f), FINC (Factor income f), YG (Government income), EG (Government expenditure), GSAV (Government saving).

- Scenario 4 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%). Scenario 5 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) along with government transfer 50% to the poor; Scenario 6 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) together with Government transfer 100% to the poorest and the poor; Scenario 7 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%) in company with government transfer 100% to the poorest and the poor.

Source: Own calculation based on the CGE model by using SAM data in 2005

In order to look into the realistic impact of the oil prices increases on the poor in 2005, the third scenario focuses more on three oil prices both in March and October consisting of gasoline (148.6%), diesel (160.6%), and kerosene (185.7%). Table 5.16a comprehensively provides the simulation results of consequences of the increase in oil prices through

employing the third scenario. By and large, all households were affected by rising oil prices in 2005 as indicated by the depressing saving performance of every household in this year. The households in urban areas were very much affected by increasing oil prices such as the poorest households in urban areas. They faced reduction of income about 1.0635 billion Rupiah. As a result, the capability of their consumption also decreased severely by 0.9059 billion Rupiah. If they want to maintain the consumption at the steady level as previous period, they will attempt to get some additional money from the other sources such as their savings (if they have) or borrowing from the other families (risk mitigation). Otherwise, reducing their consumption at certain level is usually a familiar choice which they have. This condition illustrates that the impact of increasing prices in oil has stringently produced a situation which trims down the quality of life of certain households in the society under the standard level, in particular the poor households both in urban and rural areas. Because, rising oil prices will simultaneously generate a significant level of inflation rate which affect the entire economy, commonly referred to as cost-push inflation. Furthermore, this portrait was also experienced by the other poor households both in rural and urban areas. This situation is provided in Table 5.16a.

Additionally, relying on a simple binomial calculation, the oil prices increases due to policy changes by the Indonesian government implemented in May 2008 can be systematically captured in this study. The fourth scenario provide the depressing results of the impact of rising oil prices in May 2008 founded on a SAM data base in 2005. This is presented in Table 5.16b. The results of the fourth scenario represents a slightly lesser impact of the oil prices increases which was experienced by each different household group compared to the other scenarios previously discussed, especially the scenario 3. Derived from the results of the fourth scenario, the poorest households in urban and rural areas and even the poor rural households experienced a higher income and lower consumption expenditure. Consequently, these households experienced a positive saving by 0.2093 billion Rupiah, 0.0711 billion Rupiah, and 0.1192 billion Rupiah, respectively. A smaller impact of rising oil prices was faced by poor household groups in 2008. This was probably generated by managing some adjustments of their consumption behaviour in facing the oil prices increases in addition to the

dependency rate in consuming oil of the rural and urban poorest and the rural poor is low. The noticeable magnitude of the effect of rising oil prices is provided in Table 5.16b.

With regards to the pattern of factor income, the first scenario shows that the factor income of formal labour and capital reduced by 0.3382 billion Rupiah and 0.1941 billion Rupiah, respectively. In addition, the second scenario presented a larger reduction of factor income than the first scenario. The factor income reduction of formal labour and capital amounted to 0.3477 billion Rupiah and 0.2434 billion Rupiah. According to the third scenario, nevertheless, the factor income decrease of formal and capital were much higher around 4.5063 billion Rupiah and 16.3945 billion Rupiah. Furthermore, the informal labour got hold of a better opportunity of factor income. This was strongly supported by a positive change on the economy-wide wage or factor price of informal labour by an average of 0.0037 billion Rupiah. Thus, they were able to adapt with increasing oil prices spontaneously compared to formal labour, which really depended on the government wage policy. This means that increasing oil prices generate an increase in inflation rate and then the informal labour will react dynamically over the changes. In contrast, formal labour such as government employees that have a moderately motionless income will be affected directly by increasing inflation rate as a consequence of an increase in oil prices as indicated by real income reduction, especially lower grade employee. The government usually reformulates a new wage pattern for government employees in favour of higher price increase. Thus, latterly, government employees get used to new higher prices.

In addition, the factor market equilibrium (FME) did not change absolutely when the oil prices increased. It indicates that the economy in the full employment situation in which it is producing to its maximum sustainable capacity (i.e. labour, land, capital, and technology). In a very short-run period (see section 4.2.3.4), theoretically, the factor inputs do not change even though the economy faces the economic shocks for instance oil prices increases. Therefore, the values of FME are zero (see Tables 5.16a and 5.16b). In other words, the oil prices increases did not change the working behaviour of upper middle-income households and particularly the poorest and poor households because they are already in hard working

behaviour such as no time limit, all household members as income sources and risky and easily changeable work (see Table 5.16a).

Moreover, according to the first scenario, the performance of the local government revenue was better after increasing oil prices as maintained by the positive value of the local government revenue reaching 1.4372 billion Rupiah based on the local government revenue in 2005 as the judgment base. This was relatively similar values as derived from the second scenario. However, the local government revenue based on the third scenario faced a significant reduction by 2.2464 billion Rupiah. Besides, the local government expenditure based on the first and the second scenarios experienced a growing expenditure in the amount of 9.5327 billion Rupiah. Afterwards, this situation generated a budget deficit of the local government by 8.0956 billion Rupiah. As evident in the third scenario, the government expenditure increased by a smaller number compared to the first and the second scenarios by approximately 3.3795 billion Rupiah. Hence, the budget deficit of the local government reached 5.6259 billion Rupiah.

In general, the results of the third simulation illustrate that the increase in oil prices in 2005 through the varied structure of gasoline price (148.6%), diesel price (160.6%), and kerosene price (185.7%) impinged on the whole household income reduction both in urban and rural areas compared to the first scenario and the second scenario. Besides, the great discrepancy of the oil prices increases among oil price polices in 2005, the scenario 3 has shown an indication of the psychological shock in the economy. This was really experienced by the households when the kerosene price increase performed simultaneously in 2005 (i.e. scenario 3) as indicated by higher effect on income reduction of households than the scenarios 1 and 2. If government implemented the oil prices increases partly, it would provide relatively smaller impact on the household income reduction than the oil prices increases performed by the government simultaneously in 2005. Implicitly, if an increase in oil prices consisting of gasoline, diesel and kerosene at the same time, it will generate a worse condition of households as indicated by the real income decrease than the oil prices increases were carried out partially.

In addition, Table 5.16b points out the important responsibility of the government pertaining to reducing negative impact of the oil prices increases by means of the appropriate amount of the government financial assistance to the poor and the poorest. Scenario 5 describes the conditions of poor households if the government carried out the transfer payment to the poorest and the poor both in urban and rural areas as a compensation of the oil prices increases in the amount of 50 percent. The income of the poorest and the poor for both in rural and urban areas experienced much better than the ones were not companied by the government compensation. It was indicated by reducing negative effects in their income after an increase in oil prices by -0.4456, -0.9392, -0.5584, and -0.6145 billion Rupiah, respectively. Nonetheless, the poorest and the poor in urban areas still faced a larger negative effect of the oil prices increases than the rural poorest and poor rural households even though the government financial assistance directed to them as well.

Furthermore, in accordance with scenario 6 of the study, the income of the rural and urban poorest and the poor in rural and urban areas improved. Their income decline was found to be much better, if the amount of government subsidy arrived at a 100 percent to poor households by -0.1342, -0.8148, -0.3384, and -0.5436 billion Rupiah, respectively. Nonetheless, again, the poorest and the poor in urban areas faced a little bit of the negative impact of the oil prices increases as indicated by the unnecessary conditions of their income. The scenario 7 of this study illustrates the better conditions of the income of the poorest and the poor both in rural and urban areas based on an increase of oil prices in May 2008 by using SAM data 2005. This scenario was followed by an increase in poor households' income by 100 percent from the financial assistance programs of the government. This represents that the function of the financial aid programs of the government to poor households as a result of the negative effect of the oil prices increases directly enables to remedy the conditions of poor households as indicated by the relative improvement of poor households' income.

Table 5.17 Economic Performance of Aceh by Economic Sectors According to Simulation Results by Using SAM Data in 2005 and the year 2005 as Assessment Base

Economic sectors	Base 2005	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
	Bill. Rupiah	% change	% change	% change	% change	% change	% change	% change
1. Agriculture, Livestock, Forestry & Fishery	19.2727	2.48	2.49	2.46	-8.07	1.68	0.91	-8.31
2. Mining & Quarrying	12.5564	4.03	4.03	4.01	10.22	3.40	2.82	9.42
3. Manufacturing Industries	17.6420	-1.17	-1.11	-1.15	26.34	-0.64	-0.11	25.74
4. Electricity & Water Supply	0.4038	-2.43	-2.38	-2.36	1.26	-1.37	-0.39	2.23
5. Construction	7.7877	2.52	2.47	2.54	20.19	1.23	-0.20	17.04
6.Trade, Hotel & Restaurant	1.4133	-14.04	-14.10	-13.96	-18.06	-11.27	-8.60	-15.78
7. Transportation & Communication	3.7071	-3.81	-3.84	-3.77	-0.21	-2.62	-1.48	0.72
8. Financing, Real estate,& Business Services	1.4539	-7.12	-7.12	-7.05	-12.69	-5.40	-3.77	-11.04
9. Services	6.5465	-7.56	-7.58	-7.51	-13.46	-5.46	-3.44	-11.09

Note: - Scenario 1 based on the oil prices increases comprised Gasoline price (32.6%), Diesel price (27.3%), Kerosene price (0%); Scenario 2 based on the oil prices increases consisted of Gasoline price (87.5%), Diesel price (104.8%), Kerosene price (185.7%); Scenario 3 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%); Scenario 4 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%). Scenario 5 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) along with government transfer 50% to the poor; Scenario 6 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) together with government transfer 100% to the poorest and the poor; Scenario 7 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%) in company with government transfer 100% to the poorest and the poor.

Source: Own calculation based on the CGE model by using SAM data in 2005

Additionally, Table 5.17 provides the picture of the worsening conditions of the entire economy of Aceh as indicated by the performance of some economic sectors for the year 2005 based on the CGE simulation results. In most cases, the economic sectors in Aceh experienced a considerable impact of the oil prices increases as a consequence of reducing oil subsidies by the government in 2005. This was faced by the manufacturing industries; electricity and water supply sector; trade, hotel, and restaurant sectors; transportation and communication sector; financing, real estate, and business services sector; and services sector. In addition, the agricultural sector; mining and quarrying sector; and construction sector experienced quite similar changes. It implies that these economic sectors had better opportunities in encouraging the domestic activities after the implementation of the oil prices increases conducted by the government in 2005. However, the end result of the negative impact of increasing oil prices just lasted for a while (see Table 5.15 above) which faced by certain economic sectors excluding the electricity and water supply sector together with the financial, real estate, and business services sector. The other economic sectors such as manufacturing industries; trade, hotel, and restaurant sectors; transportation and communication sector; and services sector were immediately able to fiddle with the new

prototype of the economic changes even though a higher inflation rate impinged on the whole economy of Aceh in 2005.

5.3.3 Simulations of Increasing Oil Prices and Vulnerability of Households to Poverty

At the end of this section, this empirical study explores the negative impact of oil price shocks on the vulnerability of households to poverty in line with the main objectives of this study. In addition, it also attempts to look at the structure of household income distribution in Aceh during the years 2002 and 2005. To capture the elementary depiction of these issues, the study carries out the comparison between simulation results of CGE model as a result of increasing oil prices by using SAM data in 2005 and the CGE results by employing SAM data in 2002 as judgment year. It also involved a number of simulations of the oil price changes. Along the lines of comparing two values of assessments derived from the CGE results and simulations results of CGE model in this study, it will provide the important information about how large impact of the oil prices increases on welfare gain and loss which was experienced by households both those in rural and urban areas in 2005 rooted in 2002 as base year of assessment. The results form the CGE-based model enlighten that the consequences of the increase in oil prices brought about worsening the real economic conditions of the poorest and poor households both in urban as well as rural areas. They experienced a severe situation which is called by chronic poverty. This was indicated by the income reduction of these households. The poorest urban households and poor households in rural and urban areas faced the income decrease reaching 0.3665, 0.6754, and 1.4594 billion Rupiah based on the scenario 1, respectively. According to the simulation results of the scenario 2, these households experienced with a larger income decline in the amount of 0.3701, 0.6793, and 1.4623 billion Rupiah, respectively. Then, the third scenario shows the income reduction of these households were higher than the first and the second scenarios that is 1.4879, 1.2685, and 1.8434 billion Rupiah, respectively. In this case, the poorest in rural areas also directly affected by the oil prices increases even though their incomes were still positive. Since, the increase of their income level was followed by increasing a quite same amount of their consumption expenditure level as well (see Table 5.18a). Their conditions were influenced by higher price as a consequence of the oil prices increases in this period. This is an inherent

behaviour of the poor to struggle with the phenomena of their daily life (i.e. the oil prices increases) which almost spend the equal amount of their income for consumption in spite of the saving level of the poorest in rural areas shows a positive value. In general, this situation illustrates that the economic conditions of the poorest and poor households in rural and urban areas were thoroughly vulnerable to poverty and even trapped into chronic poverty as a result of the increase in oil prices.

Moreover, middle-income households experienced nearly to the vulnerability to poverty in particular those who live in rural areas as indicated by a risky increase of their income with a relatively small change of about 0.4161 billion Rupiah for the duration of the years 2002-2005 founded on the first scenario. The results of simulating scenario 2, these households worsen through smaller value of income increase reaching 0.1490 billion Rupiah. In the shocks of simulating scenario 2, the increase of kerosene price was included. Afterwards, according to the third scenario, the income increase of the households in rural middle-income reached a little bit lower value by around 0.4161 billion Rupiah than the previous scenarios. Moreover, a small income increase, rural middle-income households underwent fairly high consumption expenditures in the amount of 1.1446 billion Rupiah. This affected their saving reduction in the amount of 0.9914 billion Rupiah during this period based on the first scenario. As a result, they were really trapped into the vulnerability to poverty. In contrast, middle-income households in urban areas faced with a huge income growth reaching 0.8126 billion Rupiah compared to the rural middle-income households based on the first scenario. Nevertheless, these households experienced a large increase in consumption expenditure in the amount of 2.5905 billion Rupiah. This probably was induced by higher living cost due to the oil prices increases and it could be also generated by highly economic activities of the urban household in middle-income class which is usually being in industrious age.

The richest and rich households both in urban and rural regions experienced the income growth considerably. However, the urban richest and urban rich households faced higher income growth by 1.5493 billion Rupiah and 1.3078 billion Rupiah than those in rural areas by 0.9104 billion Rupiah and 0.4259 billion Rupiah based on the first scenario, respectively.

Lower income increase of the richest and rich rural households and a relatively soaring consumption expenditure of them had provided large negative impact on their saving level, especially the rural rich reducing 0.8599 billion Rupiah. But, the richest rural households experienced a quite increase of income in the amount of 0.1180 billion Rupiah. In contrast, the urban rich households' income reduced in the amount of 0.3967 billion Rupiah during this period. And the urban richest went through positive saving level by 0.3915 billion Rupiah. Generally, it denotes that the rich in rural areas more suffered from a significant reduction of their saving as compared to the saving level of the rich in urban areas. Moreover, the richest households in rural and urban areas experienced the positive saving when the oil prices increased. A significant disproportion of income growth and of consumption and saving behaviour between the richest in urban and rural areas as well as between rich rural and urban households are generated by the differences in structural factor inputs (i.e. capital intensive or labour intensive), technology, infrastructure, and information.

In fact, the upshot of getting higher oil prices negatively impinged on the income of the richest in particular in rural and urban regions, but it merely took place temporarily. In a relatively short time, they were able to adapt immediately with the instable situation and then their income could be significantly improved at the same time. This condition was indicated by the saving values which remained positive. Although the expenditure of these households also rose twofold in this period, but a huge spending was directed to generate capital goods which benefited them in the future period and in turn increased their income through larger accounting multipliers. Therefore, the characteristics of consumption and saving behaviour differentiate between the rich and the poor in general. Since, the rich enabled to create higher accounting multipliers even though the economic situation is not really stable such as an increase in oil prices. In addition, this was also encouraged by the factor income which was generated through higher capital income compared to the factor income of informal labour as well as formal labour. In general, Table 5.18a noticeably provides that the impact of the oil prices increases in 2005 has affected the economic conditions (i.e. real income) of the poor to be the poorer (chronic poverty). Additionally, rural middle-income households faced nearly to poverty compared to urban middle households. Besides, the richest and the rich in rural areas and particularly the richest and the rich in urban areas were not really affected by the oil

prices increases implemented by the government in 2005. The prototype of the vulnerability of households to poverty for the years 2002 and 2005 is provided in Table 5.18a.

Table 5.18a Income and Expenditures of Households in Aceh in the Year 2002 as Basis and Their Changes due to Scenario Simulations of Various Oil Prices Increases Using SAM Data of 2005

HOUSEHOLDS	Base values in 2002			Simulations using SAM Data in 2005								
	HHINC	HHCON	Saving	Scenario 1			Scenario 2			Scenario 3		
				HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving
	Billion Rupiah			Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)		
HHVPR	4.1209	3.6356	0.4853	2.5628	2.2041	0.3587	2.5588	2.2006	0.3582	1.7984	1.5363	0.2622
HHVPU	5.1788	3.0954	2.0834	-0.3665	1.0038	-1.3703	-0.3701	1.0007	-1.3708	-1.1605	0.3275	-1.4879
HHPRR	6.3647	3.5480	2.8167	-0.6754	1.2437	-1.9191	-0.6793	1.2404	-1.9197	-1.2685	0.7442	-2.0126
HHPRU	5.0487	2.4692	2.5796	-1.4594	0.4461	-1.9055	-1.4623	0.4438	-1.9061	-1.8434	0.1342	-1.9776
HHMIR	5.2970	3.2947	2.0023	0.1532	1.1446	-0.9914	0.1490	1.1412	-0.9922	0.4161	1.3587	-0.9427
HHMIU	5.1043	2.3124	2.7919	0.8126	2.5905	-1.7778	0.8076	2.5863	-1.7787	1.3721	3.0540	-1.6820
HHRR	4.1379	2.2549	1.8830	0.4259	1.2858	-0.8599	0.4219	1.2826	-0.8608	0.0192	0.9703	-0.9511
HHRU	3.6879	2.1948	1.4931	1.3076	1.7043	-0.3967	1.3031	1.7008	-0.3977	1.5223	1.8719	-0.3496
HHVRR	2.9238	2.1227	0.8011	0.9104	0.7923	0.1180	0.9069	0.7897	0.1172	1.1947	1.0085	0.1862
HHVRU	2.6748	2.0016	0.6733	1.5493	1.1578	0.3915	1.5450	1.1546	0.3904	1.0952	0.8181	0.2770
FACTORS	FME-2002			FME-Scenario 1			FME-Scenario 2			FME-Scenario 3		
FORML	473.9600			38.2800			38.2800			38.2800		
INFORML	1014.9400			98.1400			98.1400			98.1400		
CAPFP	17.7670			17.7997			17.7997			17.7997		
	EcowideW-2002			EcowideW-Scenario 1			EcowideW-Scenario 2			EcowideW-Scenario 3		
FORML	0.0120			0.0134			0.0134			0.0026		
INFORML	0.0090			0.0096			0.0096			0.0125		
CAPFP	1.3310			0.6423			0.6409			0.1868		
	FINC-2002			FINC-Scenario 1			FINC-Scenario 2			FINC-Scenario 3		
FORML	7.2980			6.2991			6.2897			2.1311		
INFORML	8.3770			11.4082			11.3971			16.8865		
CAPFP	23.6490			46.5383			46.4890			30.3379		
GOVERNMENT	YG-2002			YG-Scenario 1			YG-Scenario 2			YG-Scenario 3		
GOVERN-Y	3.9600			8.2589			8.2587			4.5754		
GOVERN-E	EG-2002			EG-Scenario 1			EG-Scenario 2			EG-Scenario 3		
	6.8160			13.7110			13.7109			7.5577		
GOVERN-SAV	SAVG-2002			SAVG-Scenario 1			SAVG-Scenario 2			SAVG-Scenario 3		
	-2.8566			-5.4521			-5.4523			-2.9824		

Note: -HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), FORML (Formal labour), INFORML (Informal Labour), CAPFP (Capital), HHINC (Household income), HHCON (Household consumption expenditure), MPS (Marginal propensity to save), FME (Factor market equilibrium stands for demand for factor f is equal to supply of factor f), EcowideW (The economy-wide wage (rent) or factor prices of factor f), FINC (Factor income f), YG (Government income), EG (Government expenditure), GSAV (Government saving).

- Scenario 1 based on the oil prices increases comprised Gasoline price (32.6%), Diesel price (27.3%), Kerosene price (0%); Scenario 2 based on the oil prices increases consisted of Gasoline price (87.5%), Diesel price (104.8%), Kerosene price (185.7%); Scenario 3 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%).

Source: Own calculation based on the CGE model by using SAM data for the years 2002 and 2005

Moreover, Table 5.18a also provides the government revenue and expenditure through comparing the government revenue in 2002 and the government revenue which was affected by increasing oil prices in 2005. From the empirical results of the study illustrate that the

performance of government revenue sharply bumped up in the amount of 8.2589 billion Rupiah founded on the CGE simulation results of scenario 1. Nevertheless, a sharp increase of government revenue is accompanied as well by the significant rise of the government expenditure by 13.7110 billion Rupiah. In turn this situation considerably generated the saving decline approximately 5.4521 billion Rupiah based on the first scenario.

Table 5.18b The Changes of Poor Households' Income and Expenditure in Aceh due to Receiving Government Transfers in Comparison to the Base Situation in 2002 According to Simulation Results by Using SAM Data of 2005

HOUSEHOLDS	Simulations using SAM Data in 2005											
	Scenario 4			Scenario 5			Scenario 6			Scenario 7		
	HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving	HHINC	HHCON	Saving
	Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)			Change (Billion Rupiah)		
HHVPR	4.2126	3.6456	0.5670	2.1098	1.8083	0.3015	2.4211	2.0803	0.3408	4.7776	4.1392	0.6384
HHVPU	0.3828	1.6421	-1.2592	-1.0361	0.4334	-1.4695	-0.9117	0.5393	-1.4511	0.5963	1.8239	-1.2276
HHPRR	0.2652	2.0359	-1.7707	-1.0485	0.9295	-1.9779	-0.8285	1.1147	-1.9432	0.6593	2.3678	-1.7085
HHPRU	-1.2703	0.5997	-1.8700	-1.7725	0.1918	-1.9643	-1.7016	0.2494	-1.9510	-1.1518	0.6959	-1.8478
HHMIR	-0.0064	1.0146	-1.0210	0.4422	1.3800	-0.9378	0.4683	1.4013	-0.9330	0.0079	1.0263	-1.0184
HHMIU	0.1333	2.0276	-1.8943	1.3979	3.0755	-1.6775	1.4238	3.0969	-1.6731	0.1474	2.0392	-1.8918
HHRR	0.3408	1.2198	-0.8790	0.0424	0.9883	-0.9459	0.0656	1.0063	-0.9407	0.3610	1.2355	-0.8744
HHRU	0.7468	1.2666	-0.5198	1.5439	1.8887	-0.3448	1.5655	1.9056	-0.3401	0.7616	1.2781	-0.5165
HHVRR	0.3829	0.3913	-0.0084	1.2111	1.0210	0.1901	1.2274	1.0334	0.1940	0.3947	0.4003	-0.0056
HHVRU	0.9407	0.7026	0.2381	1.1116	0.8304	0.2812	1.1281	0.8427	0.2853	0.9617	0.7183	0.2434
FACTORS	FME-Scenario 4			FME-Scenario 5			FME-Scenario 6			FME-Scenario 7		
FORML	38.2800			38.2800			38.2800			38.2800		
INFORML	98.1400			98.1400			98.1400			98.1400		
CAPFP	17.7997			17.7997			17.7997			17.7997		
	EcowideW-Scenario 4			EcowideW-Scenario 5			EcowideW-Scenario 6			EcowideW-Scenario 7		
FORML	0.0184			0.00287			0.0031			0.0186		
INFORML	0.0104			0.01254			0.0126			0.0103		
CAPFP	1.2922			0.19168			0.1965			1.2861		
	FINC-Scenario 4			FINC-Scenario 5			FINC-Scenario 6			FINC-Scenario 7		
FORML	10.9003			2.211119			2.2911			10.9217		
INFORML	13.0338			16.94964			17.0127			12.9267		
CAPFP	69.6535			30.50982			30.6817			69.4360		
GOVERNMENT	YG-Scenario 4			YG-Scenario 5			YG-Scenario 6			YG-Scenario 7		
GOVERN-Y	8.2611			4.5788			4.5824			8.7910		
GOVERN-E	EG-Scenario 4			EG-Scenario 5			EG-Scenario 6			EG-Scenario 7		
	13.7134			7.5982			7.6387			14.5201		
GOVERN-SAV	SAVG-Scenario 4			SAVG-Scenario 5			SAVG-Scenario 6			SAVG-Scenario 7		
	-5.4523			-3.0195			-3.0563			-5.7291		

Note: -HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), FORML (Formal labour), INFORML (Informal Labour), CAPFP (Capital), HHINC (Household income), HHCON (Household consumption expenditure), MPS (Marginal propensity to save), FME (Factor market equilibrium stands for demand for factor f is equal to supply of factor f), EcowideW (The economy-wide wage (rent) or factor prices of factor f), FINC (Factor income f), YG (Government income), EG (Government expenditure), GSAV (Government saving).

- Scenario 4 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%). Scenario 5 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) along with government transfer 50% to the poor; Scenario 6 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) together with government transfer 100% to the poorest and the poor; Scenario 7 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%) in company with government transfer 100% to the poorest and the poor.

Source: Own calculation based on the CGE model by using SAM data for the years 2002 and 2005

Next, Table 5.18b provides the role of the government subsidy with regards to trimming down the negative consequences of the increase in oil prices by way of implementing the suitable amount of the government financial assistance to the poor. In this part, this study provides a comparison of the scenarios' results of the CGE model by using SAM data of the year 2005 and the results of CGE model of the year 2002 as assessment base. According to scenario 5, if the government carried out the transfer payment, such compensation of the increase in oil prices to the poorest and the poor both in urban and rural areas by an increase of 50 percent to their income, the income of poor households for both in rural and urban areas would end up a relatively small improvement. It was indicated by a quite large negative gap between the income in 2002 and 2005 after increasing oil prices in the amount of 1.0361, 1.0485, and 1.7725 billion Rupiah, respectively. Moreover, the values of saving of each household experienced with a small decline compared to their economic conditions without government compensation by 1.4695, 1.9779, and 1.9643 billion Rupiah, respectively. On the contrary, the poorest rural households experienced with higher increase of income by 2.1098 billion Rupiah than the consumption expenditure by 1.8083 billion Rupiah. As a result, the rural poorest faced a positive saving level in the amount of 0.3015 billion Rupiah. By and large, this situation portrays that the purchasing power of the poor in rural and urban areas as indicated by the real incomes were tightly affected by a higher inflation rate.

Furthermore, the pattern of the results based on scenario 6 of this study, the poorest and the poor in rural and urban areas would experience much better improvements of their income if the amount of the government subsidy to poor households increased in the amount of a 100 percent. These households' income increased compared to their conditions with previous small government compensation (50%) to the poor around 2.4211, -0.9117, -0.8285, and -1.7016 billion Rupiah, respectively. Nevertheless, the saving values of poor households both in rural and urban areas were still negative. Subsequently, the scenario 7 of this study provided the relative better conditions of the income of the poorest and the poor both in rural and urban areas if the government implemented an increase in oil prices in May 2008 by using SAM data 2005 accompanied by a 100 percent of the government financial support to the poor households' income (see Table 5.18b).

In general, the scenarios 5, 6, and 7 explain that the role of government financial subsidy to poor households when the increase in oil prices implemented by the government did not tightly generate better conditions of poor households. This situation was indicated by the small income changes of each household in 2005 compared with their income in 2002. It implies that the government financial assistance merely equalized to the nominal income of poor households before the implementation of the oil prices increases. Implicitly, the government compensation as a result of increasing in oil prices did not really improve the socio-economic conditions of poor households for a long time, but it was solely for a short time condition. Accordingly, the socio-economic conditions of poor households become worse in the next periods owing to a higher inflation. Therefore, the impact of rising oil prices will genuinely deteriorate the well-being conditions of poor households and force them to face high vulnerability rate to poverty and even they are trapped into the chronic poverty.

Table 5.19 Economic Performance of Aceh by Economic Sectors According to Simulation Results by Using SAM Data in 2005 and the year 2002 as Assessment Base

Economic sectors	Base 2002	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
	Bill. Rupiah	% change	% change	% change	% change	% change	% change	% change
1. Agriculture, Livestock, Forestry & Fishery	10.6886	84.78	84.79	84.74	65.76	83.35	81.95	65.32
2. Mining & Quarrying	7.5710	72.53	72.54	72.50	82.80	71.48	70.53	81.47
3. Manufacturing Industries	16.5779	5.18	5.23	5.20	34.45	5.74	6.31	33.81
4. Electricity & Water Supply	0.8900	-55.72	-55.70	-55.70	-54.05	-55.24	-54.80	-53.61
5. Construction	2.1577	270.01	269.86	270.10	333.81	265.36	260.22	322.43
6.Trade, Hotel & Restaurant	0.3503	246.81	246.58	247.13	230.60	257.99	268.78	239.78
7. Transportation & Communication	2.0218	76.38	76.32	76.45	82.98	78.56	80.64	84.67
8. Financing, Real estate,& Business Services	1.6412	-17.71	-17.72	-17.65	-22.65	-16.20	-14.75	-21.19
9. Services	1.1940	406.84	406.71	407.12	374.49	418.35	429.41	387.49

Note: - Scenario 1 based on the oil prices increases comprised Gasoline price (32.6%), Diesel price (27.3%), Kerosene price (0%); Scenario 2 based on the oil prices increases consisted of Gasoline price (87.5%), Diesel price (104.8%), Kerosene price (185.7%); Scenario 3 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%); Scenario 4 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%). Scenario 5 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) along with government transfer 50% to the poor; Scenario 6 based on the oil prices increases in March + October consisted of Gasoline price (148.6%), Diesel price (160.6%), Kerosene price (185.7%) together with government transfer 100% to the poorest and the poor; Scenario 7 based on the oil prices increases in May 2008 consisted of Gasoline price (231.5%), Diesel price (233.3%), Kerosene price (257.1%) in company with government transfer 100% to the poorest and the poor.

Source: Own calculation based on the CGE model by using SAM data for the years 2002 and 2005

The following Table 5.19 illustrates the economic performance in Aceh during the years 2002 and 2005 through comparing the base results of the CGE model in 2002 to the CGE simulation results in 2005. The electricity and water supply sectors accompanied by the

financial, real estate, and business services sectors experienced the depressing changes in this period. The decrease of domestically economic activities of those in Aceh during the year 2005 was conclusively affected by the completing of the oil prices increases as a consequence of the cutting oil subsidies in this year. In this case, the electricity and water supply sectors faced negative effect as compared to the financial, real estate, and business services sectors on average over 50 percent in billion Rupiah. Moreover, the financial, real estate, and business services sectors were greater than 14 percent in billion Rupiah. Nevertheless, the other economic sectors in Aceh were promptly able to deal with the negative effect of increasing prices in oil such the manufacturing industries; trade, hotel, and restaurant sectors; transportation and communication sector; and services sectors as indicated by the positive changes of domestic activities (also see Table 5.15). On the contrary, the agricultural sector; mining and quarrying sector; and construction sector looked toward the positive adjustments in 2005. In general, only the electricity and water supply sectors along with the financial, real estate and business services sectors experienced persistently the off-putting end results of the oil prices increases conducted by the government in 2005.

Relying on the nature of household income distribution, poverty and the vulnerability to poverty comprehensively discussed in the previous sections, there are some decisive points as a wide-ranging outlook of this part, taking into consideration the impact analysis of the oil prices increases in the general equilibrium. The outlooks are also accompanied by several scenarios of the impact of increasing oil prices by using the CGE-based model which are implemented both individual and simultaneous changes of the oil prices on the household income structure both in rural and urban regions. First, there was a considerable increase of household income in Aceh during the period of 2002-2005. Rising income of households, however, was only considered as a pseudo income effect. Since, the enormous increase of household income in 2005 was accompanied by a significant increase of the consumption expenditure at the same time. As a result, the effect of increasing consumption expenditure affected the savings performance of households in Aceh, which tended to drastically reduce in 2005 for both those who live in rural and urban areas excluding the richest households in rural and urban regions. In this case, the richest in rural and urban areas survived by the increase of saving level. Second, the differences of the impact experienced by the poor and the rich in

rural regions and especially in urban areas were caused by the dissimilarities in the structural production factors and average price of production factors (economy-wide wage [rent] or factor prices) among formal labour factor, informal labour factor, and capital factor. Thus, in turn, these conditions generated the variation of income distribution among households both in rural and urban areas in Aceh which become higher and higher. Third, the saving decline of households was strappingly triggered by prices increase as a result of swelling oil prices in 2005. In view of that, the real households' income trimmed down rigorously. Fourth, in fact, there was powerfully influential psychological effect[82] that influenced the mentality of society (retailed suppliers) as a result of the increase in oil prices in 2005, which generated relatively greater shocks on household income.

Fifth, based on the results of several simulations of the study in the general equilibrium framework, increasing oil prices stimulated an increase in the vulnerability rate of households to poverty in Aceh considerably and worsened the households' income. Moreover, they are trapped into chronic poverty, especially the poorest, poor and middle-income households both in rural and urban areas. Sixth, the function of government financial assistances to poor households enabled to generate better conditions of poor household income as before the oil prices increases. However, it did not absolutely solve the fundamental issues relating to the vulnerability of households to poverty in Aceh, especially the poorest, poor and middle-income households both in rural and urban areas. Last but not least, only the electricity and water supply sectors along with the financial, real estate and business services sectors experienced an off-putting end result of the oil prices increases implemented by the government in 2005. In addition, the other economic sectors enabled to deal with the negative effect of increasing prices in oil such as the manufacturing industries; trade, hotel, and restaurant sectors; transportation and communication sector; and services sector. On the contrary, moreover, the agricultural sector; mining and quarrying sector; as well as construction sector looked toward the positive adjustments in 2005.

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82) In reality, the oil prices will increase after the government declares a new oil price. For speculative purposes, certain individual in society (the mentality of society as retailed suppliers) tend to accumulate oil stocks as much as possible so that it engender the scarcity of oil in society. Thus, retail oil prices in society become higher.

5.4 General View of Three Approaches and Results of the Study

The main point of this study was the impact of the oil prices increases on account of cutting government subsidies on oil, which had a life-threatening impact on poor households and the vulnerability of certain households both in rural and urban regions as well as on the whole economy in Aceh. To capture wide-ranging results of the main issues of the study, it makes use of three approaches i.e. the Descriptive Analysis Approach, the SAM-based model, and the CGE model. Firstly, employing the Descriptive Analysis Approach, this study enables to capture the realistic conditions of the poor in term of the characteristics of the poor in looking toward the behaviour of the oil prices increases for the year 2005 in Aceh using primarily data accompanied by secondary data. Secondly, the Social Accounting Matrix (SAM) approach also has a fundamental analysis of this study in order to describe the negative impact of the oil price rise on the poor accompanied with direct, indirect, and global analysis through calculating accounting multipliers based on SAM data of Aceh for the years 2002 and 2005. Global accounting multipliers effect is decomposed within three categories consisting of transfer effects, open-loop effects, and closed-loop effects which aimed at exploring income distribution of each institution group. Finally, the Computable General Equilibrium (CGE) model constitutes an important tool of this study to investigate the impact of the increase in oil prices on the poor using two periods of SAM data sets of Aceh for the years 2002 and 2005. Therefore, it enables one to present comprehensively the widespread and realistic situations of the depressing impact of the oil price increase on the poor and the vulnerability of households to poverty in conjunction with the income structures of households. Besides, it is also able to capture the appropriate share of government transfer as compensation actions to the poor which aim at reducing the consequential effects of the oil prices increases. In general, three approaches support each other. Therefore, this study has genuinely provided comprehensive findings and fundamental conclusions with reference to the negative impact of the oil price shocks on the poor and the vulnerability of certain households to poverty in Aceh.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The most important focus of this study is to take a look at the consequences of increasing oil prices on the poor throughout the years 2002 and 2005. Empirically, it generated a serious analysis of the welfare decline of poor households and resulted in a higher vulnerability rate of households to poverty in Aceh, particularly poor and middle-income households through higher inflation rate. To look into the possible negative effects of oil prices increases, this study utilizes three approaches to identify and investigate the damaging consequences of the oil prices increases on the poor in Aceh on account of the oil subsidy reduction. They are; the descriptive analysis approach (DAA) which is conducted to capture the main characteristics of the poor by means of the primary data; the SAM-based model which is performed to explore the issues of income distribution among institutions by using SAM data for the years 2002 and 2005; and finally the CGE-based model which is employed to examine the impact of the oil prices increases on the poor precisely by implementing GAMS.

There are some critical points that should be strictly considered by policy makers of the central government and particularly the local government of Aceh, which is provided by three approaches as an instrument to look at the whole story of consequences of increasing oil prices on poor households. Firstly, based on the results of the DAA, there is a great discrepancy of the oil prices between the government oil prices resolution and the realistic oil prices in society. The oil prices in society are more expensive and even twofold government oil prices declaration in particular kerosene and gasoline prices. Secondly, the effects of the oil prices increases have inspired a negative impact on real income level of poor and middle-income households, since increasing nominal income is followed simultaneously by higher inflation rate. As a result of real income reduction, it encroaches negatively on the quality of households' life as indicated by the conditions of their consumption level which deteriorates drastically in the near future. They are identified by specific socio-economic characteristics, namely greater household size, mainly profession as a farmer, and a lower education. Thirdly, the strategy of government compensation on account of the negative effect of increasing oil prices on the poor is not sufficient enough to strengthen the economy of the poorest, poor, and

middle-income households who directly and indirectly experienced the greatest impact of the oil prices increases. Consequently, the poverty rate in Aceh still remains high. The reasons are highly caused by low capability of the government, especially the local government management; lack of comprehensive and representative data relating to the socio-economic classification of households both in rural and urban areas who should precisely receive the government help; the limitation of government understanding pertaining to the concept of poverty and the vulnerability of households to poverty as a dynamic problem; and possibly no serious commitment in combating poverty alleviation in Aceh as indicated by the poverty rate getting higher level even though fiscal revenues of Aceh which have been being higher and higher since 1999.

Furthermore, the other tool the social accounting matrix approach employed for capturing direct, indirect and global accounting multipliers effect on the income distribution across institutions in Aceh provides some critical points. First, the firms always take delivery of large enough accounting multipliers both in 2002 and 2005 as compared to the other institutions. It means that the government must really implement the precise actions of every policy in the economy in order to reduce the inequality of income distribution across institutions, particularly the poor and the rich in urban and rural areas and to align the sustainable development of Aceh in general by strengthening inter-linkages of the potential economic sectors. Second, the greater accounting multipliers of the various institutions and household groups both in urban or in rural areas was induced by global accounting multipliers effect rather than direct and indirect accounting multipliers effect. However, the indirect accounting multipliers affected rather larger than direct accounting multipliers to the various groups of institutions in urban or in rural areas. Third, the poorest, poor, and middle-income households experienced the smallest impact of the accounting multipliers effect. And fourth, increasing prices influence the entire economy; in particular the real income of certain households which worsen such as the poorest, poor, and middle-income households. Finally, the impact of the oil prices increases had an effect on escalating the vulnerability rate of households to poverty in Aceh based on the analysis of real income distribution among institutions for the duration of the years 2002 and 2005.

The impact assessments of the oil prices increases derived from the CGE model along with simulating a number of scenarios of the increases in oil prices individually and simultaneously on poor households both in rural and urban regions provide some important conclusions as well. First, during the years 2002-2005, the household income in Aceh increased significantly both in rural and even in urban areas. Unfortunately, a huge increase of household income was significantly accompanied by the rise of the consumption expenditures. This condition was strongly generated by higher inflation rate at the same time. Consequently, the saving level of households severely trimmed down in 2005 excluding the richest households in rural and urban regions. Second, the differences in the level of upshot which affected the poor and the rich in rural areas as well as in urban areas was instigated by the dissimilarities in the quality and the structural production factor and the average price of production factors (economy-wide wage [rent] or factor prices) among formal labour, informal labour, and capital formation which mostly belongs to some households in urban areas. Thus, this situation directly brings into being the elevated inequality of household income distribution among them in Aceh. Third, the shock of saving decline was triggered by the oil prices increases and in sequence accelerated a wide-ranging prices growth sharply in 2005. It is well-known called pseudo income effect because the increase of nominal income of poor households in 2005 was strappingly stimulated by wage rate growth. But, the wage rise was not really equal to an increase in commodity prices or inflation rate. Consequently, the real income of the poor dropped drastically. Fourth, psychological effect as a result of increasing oil prices played an important role in disturbing the frame of retailed suppliers' mind on oil (speculative motive in accumulating oil stocks as much as possible) in Aceh. This condition indicates that the oil prices increases generated the uncertain increase in oil prices in the society. As a result, the real income of the households in rural and urban areas in particular the poorest, poor, and middle-income households worsened severely. Fifth, the results of several simulations using the CGE-based model show that the oil prices increases have been affecting a quite higher vulnerability of the poorest, the poor and middle-income households in rural areas to poverty than the ones in urban areas and even forcing them into chronic poverty conditions. Sixth, the function of the government compensation as a consequence of the oil prices increases to poor households enables to engender better poor

households' nominal income as before the oil prices increases implemented by the government. However, in the reality, it does not absolutely get to the bottom of the crucial problems in respect of the vulnerability of households to poverty in Aceh derived from the real income side, especially the poorest, poor and middle-income households who dwell in rural and urban areas. In other words, it is just the money illusion. As a final point of the study, the economic performances in Aceh during the realization of increasing prices in the oil points up that only the electricity and water supply sectors together with the financial, real estate, and business services sectors experienced an off-putting end result of the oil prices increases which was implemented by the government in 2005. The other economic sectors, however, were able to cope with the negative effect of increasing prices in the oil, for instance the manufacturing industries; trade, hotel, and restaurant sectors; transportation and communication sector; and services sector.

6.2 Recommendations

There are several critical points derived from this study. They must be really taken into account by the government as indispensable actions with respect to the impact of the oil prices increases as a consequence of the oil subsidy reduction on the poor and the vulnerable households to poverty in the short run and long run strategies. The actions are tightly needed to involve in development planning in actuating the poverty alleviation and the vulnerable mitigation of households to poverty, the equality of income distribution among households, and sustainable development of Aceh in general.

6.2.1 Short Run Strategies

Firstly, there is a big disparity of the oil prices between the government oil price resolution and the realistic oil prices in society. The oil prices in the society are higher and even twofold government oil prices declaration, in particular kerosene and gasoline prices. Consequently, it is definitely required to improve the government control systematically in the direction of the operational management of the oil prices increases policy. The actions must be strengthened by the legitimated law and the strength of punishment with respect to condensing psychological pressure of the unrealistic oil prices increases from "free sellers". In addition, the local government through PERTAMINA should provide a number of oil stations to fulfil societal needs in rural and urban areas in order to maintain the sustainability of oil stock

aimed at minimizing the scarcity of oil in society. Secondly, the necessary objectives of increasing oil prices compensation which are provided to poor households are aimed at trimming down the resulting oil prices increases on the poor. An extraordinarily ultimate expectation from accomplishing the compensation programs, they are thoroughly able to become accustomed to current conditions after rising oil prices. In the real world, the usual assistances provided by the government have a form of nominal money (BLT or Cash Transfer Payment) to the poor. Unfortunately, large numbers of compensations made available by government will not be enough to anticipate increasing goods and services prices in consequence of higher inflation rate. This phenomenon is well called by wage-price spiral effect which is experienced by particularly the poor both in rural and urban areas. Accordingly, it is genuinely required to regulate the government compensations of the oil prices increases by way of improving public goods such as public infrastructures (public investment) of society particularly for the poor in rural and urban regions. These public infrastructures can be formed such as public transportation system (or widely public infrastructures) inside and outside of the city and comfortable facilities for bicycle riders and pedestrians in addition to improving schooling facilities and health care.

6.2.2 Long-Run Strategies

The first, the compensation programs as a result of increasing oil prices which were carried out by the government on poor households do not accurately reach the appropriate goals of the programs. The recipients of compensation programs should encompass 100 percent of poor households. In reality, only 78.3 percent of the poor received it from the implementation of the oil price compensation programs, while 21.7 percent received by middle-income and rich households (see previous Figure 5.9). This is tightly instigated by unsatisfactory data relating to the household classifications such as absolute poverty of households or the vulnerable households to poverty possessed by the government. As a result, the poverty alleviation programs, either the compensation programs of the oil prices increases or the other compensations of shocks, do not achieve the ultimate objectives of the programs. That's why it is necessitated methodically to identify the structural demography of society precisely that covers the socio-economic aspects of Aceh with the purpose of bringing into being the development planning concept, which genuinely accommodated the societal elementary

needs. Accordingly, it must be able to generate the structural balancing role of production factors with respect to labours and capital intensive and in turn, stimulate the vigorous wage scheme policy with the intention of high and fair equality. The second, to diminish inflation anxiety and psychological effects in all aspects of societal living conditions as a result of the oil prices increases, the government should ensure the conditions of free movement of society's primary needs and reduce high dependency of regions in fulfilling basic needs from the other regions. Therefore, strengthening the regional economic potency and establishing inter-linkages among each potential economy sector are seriously guided by the government master plan of economic and social development in order to accurately anticipate the possibilities of government policy changes as well as the uncertainty of the external economic and even political shocks.

6.3 Limitations and Recommendations for Advanced Studies

In general, this study concentrates more on investigating a complicated phenomenon with regards to the impact of the oil prices increases on the poor in Nanggroe Aceh Darussalam Province, Indonesia, by means of comparing three methods' results which aimed at exploring a comprehensive view of its impact in reality. The concluding findings of this study disclose that these approaches have facilitated to make available some fundamental conclusions. This study, nevertheless, still necessitates some additional empirical studies in line with these issues as a consequence of some boundaries of the models event though the study has utilized three approaches with the different perspectives: the Descriptive Analysis Approach, the SAM-based model, and the CGE-based model. Along the lines of the limitations of the applied models in the study, there are some critical notes which can be appreciatively considered for the further studies, namely: Firstly, the additional studies should be able to look into the main characteristics of poor households together with the vulnerability to poverty precisely with reference to both qualitative and quantitative features by using the field survey data. It would be much better for uniformity of analysis if the entire results of the field study can be taken as a basic framework in formulating a SAM data set. Secondly, the further studies should make an effort to involve monetary variables in the CGE model in order to capture inflation matters accurately and genuinely make possible to present it in a dynamic model as a constructive step in producing the far-reaching results.

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APPENDICES

Appendix 1: General Algebraic Model Description

The Parameters of the Model

Parameter	Name of parameter
	Parameters other than tax rates
α_A^a	shift parameter for top level CES function
α_A^{va}	shift parameter for CES activity production function
α_C^{ac}	shift parameter for domestic commodity aggregation function
α_C^q	shift parameter for Armington function
α_C^t	shift parameter for CET function
$\beta_{A,C,H}^h$	marginal share of household consumption spending on home commodity c from activity a
$\beta_{C,H}^m$	marginal share of consumption spending on marketed commodity c
$cwts_c$	consumer price index weights
δ_A^a	share parameter for top level CES function
$\delta_{F,A}^{va}$	share parameter for CES activity production function
δ_{AC}^{ac}	share parameter for domestic commodity aggregation function
δ_C^q	share parameter for Armington function
δ_C^t	share parameter for CET function
$dwts_C$	domestic sales price weights
$\gamma_{C;H}^m$	per-capita subsistent consumption of marketed commodity c for household h
$\gamma_{A,C;H}^h$	per-capita subsistent consumption for household h on home com c from activity a
$ica_{C,A}$	intermediate input c per unit of aggregate intermediate
$inta_A$	aggregate intermediate input coefficient
iva_A	aggregate value added coefficient
$icd_{C,CP}$	trade input of c per unit of com cp produced & sold domestically
$ice_{C,CP}$	trade input of c per unit of com cp exported
$icm_{C,CP}$	trade input of c per unit of com cp imported
$mps01_{INS}$	0-1 par for potential flexing of savings rates
$mpsbar_{INS}$	marginal prop to save for dom non-gov inst ins (exog part)
$qdst_C$	inventory investment by sector of origin
$qbarg_C$	exogenous (unscaled) government demand
$qbarinv_C$	exogenous (unscaled) investment demand
$\theta_{A,C}$	yield of commodity c per unit of activity a
ρ_A^a	CES production function exponent

ρ_A^{va}	CES activity production function exponent
ρ_C^{ac}	domestic commodity aggregation function exponent
ρ_C^{q}	Armington function exponent
ρ_C^{t}	CET function exponent
$Shif_{INS,F}$	share of dom. inst i in income of factor f
$Shii_{INS,INSP}$	share of inst i in post-tax post-saving income of inst insp
$Supernum_H$	LES supernumerary income
$tins01_{INS}$	0-1 par for potential flexing of dir tax rates
$trnsfr_{INS,AC}$	transfers from inst. or factor ac to institution ins
	Tax rates
ta_A	rate of tax on producer gross output value
te_C	rate of tax on exports
tf_F	rate of direct tax on factors (soc sec tax)
$tinsbar_{INS}$	rate of (exog part of) direct tax on dom inst ins
tm_C	rate of import tariff
tq_C	rate of sales tax
tva_A	rate of value-added tax

The Sets of the Model

Set	Name of set
	Model sets
AC	global set for model accounts-aggregated MicroSAM accounts
A_{AC}	activities
$ACES_A$	activities with CES function at top of technology nest
$ALEO_A$	activities with Leontief function at top of technology nest
C_{AC}	commodities
CD_C	commodities with domestic sales of output
CDN_C	commodities without domestic sales of output
CE_C	exported commodities
CEN_C	non-exported commodities
CM_C	imported commodities
CMN_C	non-imported commodities
CX_C	commodities with output
F_{AC}	factors
INS_{AC}	institutions
$INSD_{INS}$	domestic institutions
$INSDNG_{INSD}$	domestic non-government institutions
H_{INSDNG}	households
	Calibration sets
CINV(C)	fixed investment goods
CT(C)	transaction service commodities
CTD(AC)	domestic transactions cost account
CTM(AC)	import transactions cost account

CTE(AC)	export transactions cost account
	Report sets
EH_H	consumption spending for household
FACEQUIL	factor market equilibrium
MPS_{INS}	marginal propensity to save for domestic non-government institution institution
WF_F	economy-wide wage (rent) for factor f
YF_F	income of factor *f*
YI_{INS}	income of domestic nongovernmental institution

The Variables in the Model

Variables	Name of variables
	Exogenous Variables
CPI	consumer price index (PQ-based)
DTINS	change in domestic institution tax share (= 0 for base; exogenous variable) or change in domestic institution tax share
FSAV	foreign savings (FCU)
GADJ	government consumption adjustment factor (government demand scaling factor)
IADJ	investment adjustment factor (for fixed capital formation)
MPSADJ	savings rate scaling factor (= 0 for base)
QFS_F	quantity supplied of factor
TINSADJ	direct tax scaling factor (= 0 for base; exogenous variable)
$WFDIST_{F\,A}$	wage distortion factor for factor f in activity a (factor wage distortion variable)
	Endogenous variables
DMPS	change in domestic institution savings rates or MPS (= 0 for base; exogenous variable) for selected institution
DPI	producer price index for domestically marketed output (PDS-based)
EG	total current government expenditures
EH_H	consumption spending for household
EXR	exchange rate (LCU per unit of FCU)
GOVSHR	government consumption share in nominal absorption
GSAV	government savings
INVSHR	investment share in nominal absorption
MPS_{INS}	marginal propensity to save for domestic non-government institution institution (exogenous variable)
PA_A	activity price (unit gross revenue) or output price of activity a
PDD_C	demand price for commodity produced and sold domestically
PDS_C	supply price for commodity produced and sold domestically
PE_C	export price (domestic currency)
$PINTA_A$	aggregate intermediate input price for activity a
PM_C	import price (domestic currency)
PQ_C	composite commodity c price

PVA_A	value-added price (factor income per unit of activity)
PWE_C	world price of exports
PWM_C	world price of imports
PX_C	aggregate producer price for commodity or average output price
$PXAC_{A\,C}$	producer price of commodity c from activity a
QA_A	quantity (level) sales of domestic activity
QD_C	quantity sold domestically of domestic output
QE_C	quantity of exports
$QF_{F\,A}$	quantity demanded of factor *f* from activity *a*
QG_C	government consumption demand for commodity
QH_{CH}	quantity consumed of marketed commodity c by household *h*
$QHA_{A\,C\,H}$	quantity of household home consumption of commodity c from activity *a* for household *h*
$QINTA_A$	quantity of aggregate intermediate input
$QINT_{CA}$	quantity of commodity *c* as intermediate input to activity *a*
$QINV_C$	quantity of fixed investment demand for commodity
QM_C	quantity of imports of commodity
QQ_C	quantity of goods supplied to domestic market (composite goods supply)
QT_C	quantity of commodity demanded as trade and transport input
QVA_A	quantity of (aggregate) value-added
QX_C	aggregated marketed quantity of domestic output of commodity
$QXAC_{A\,C}$	quantity of marketed output of commodity *c* from activity *a*
$TABS$	total nominal absorption
$TINS_{INS}$	direct tax rate on domestic institutions institution
$TRII_{INS\,INS}$	transfers from domestic institution *i.* to *i* (both in the set INSDNG)
WALRAS	Savings–Investment imbalance (should be zero)
WALRASSQR	Walras squared
WF_F	average price of factor *f (*economy-wide wage (rent) for factor f)
YF_F	income of factor *f*
YG	total current government revenue
YI_{INS}	income of domestic non-government institution
$YIF_{INS\,F}$	income to domestic institution *i* from factor *f*

The Equation of the Model

Name of the equation	**Equations**
Price equation	
Domestic import price	$PM_c = pwm_c.(1 + tm_c).EXR + \sum_{C' \in CT} PQ_C.icm_{c'c}$ (c ∈ CM, a set of imported commodities)
……	……
Domestic export price	$PE_c = pwe_c.(1 - te_c).EXR - \sum_{C' \in CT} PQ_C.ice_{c'c}$ (c ∈ CE**,** a set of exported commodities)

……

Demand price for com c produced and sold domestically (domestic nontraded goods)

$$PDD_c = PDS_c + \sum_{c' \in CT} PQ_{c'}.icd_{c'c}$$

(c ∈ CD, a set of commodities with domestic sales of domestic output)

……

Absorption (value of sales in domestic market)

$$PQ_c.(1 - tq_c).QQ_c = PDD_c.QD_c + PM_c.QM_c$$

(c ∈ (CD ∪ CM), commodities in domestic market)

……

Marketed output value (value of marketed domestic output)

$$PX_c.QX_c = PDS_c.QD_c + PE_c.QE_c$$

(c ∈ CX, a set of commodities with domestic production)

……

Activity price (output price for activity a)

$$PA_a = \sum_{c \in C} PXAC_{ac}.\theta_{ac}$$

(a ∈ A, a set of activities A)

……

Aggregate intermediate input price

$$PINTA_a = \sum_{c \in C} PQ_c.ica_{ca}$$

(a ∈ A, aggregate intermediate input for activity A)

……

Activity revenue and costs (value-added price)

$$PA_a.(1 - ta_a).QA_a = PVA_a.QVA_a + PINTA_a.QINTA_a$$

(a ∈ A, value-added for activity A)

……

Consumer price index

$$\overline{CPI} = \sum_{c \in C} PQ_c.cwts_c$$

……

Producer price index for non-traded market output (domestic producer price index)

$$DPI = \sum_{c \in C} PDS_c.dwts_c$$

Production and trade equation

CES technology; Activity production function (CES aggregate prod fn (if CES top nest))

$$QA_a = \alpha_a^a.(\delta_a^a.QVA_a^{-p_a^a} + (1 - \delta_a^a).QINTA_a^{-p_a^a})^{\frac{1}{p_a^a}}$$

(a ∈ ACES, a set of activities with a CES aggregate production function at the top of the technology nest)

……

CES technology; Value-added intermediate-input quantity ratio (CES aggregate first-order condition (if CES top nest))

$$\frac{QVA_a}{QINTA_a} = \left(\frac{PINTA_a}{PVA_a} . \frac{\delta_a^a}{1-\delta_a^a} \right)^{\frac{1}{1+p_a^a}}$$

(a ∈ ACES, value-added intermediate input with a CES aggregate first order condition function at the top of the technology nest)

……

Leontief technology; Demand for aggregate value-added (Leontief aggregate intermediate demand (if Leontief top nest))

$$QVA_a = iva_a . QA_a$$

(a ∈ ALEO, a set of activities with a leontief function at the top of the technology nest)

……

Leontief technology: Demand for aggregate intermediate input (Leontief aggregate value-added demand (if Leontief top nest))

$$QINTA_a = \text{int}\, a_a . QA_a$$

(a ∈ ALEO, aggregate intermediate input with a leontief function at the top of the technology nest)

……

Value-added and factor demands (CES value-added production function)

$$QVA_a = \alpha_a^{va} . \left(\sum_{f \in F} \delta_{fa}^{va} . QF_{fa}^{-p_a^{va}} \right)^{\frac{1}{p_a^{va}}}$$

(a ∈ A, activities with a CES value-added production function)

……

Factor demand (CES value-added first-order condition)

$$WF_f . \overline{WFDIST_{fa}} = PVAa.(1-tva_a).QVA_a . \left(\sum_{f \in F} \delta_{fa}^{va} . QF_{fa}^{-p_a^{va}} \right)^{-1} . \delta_{fa}^{va} . QF_{fa}^{-p_a^{va}-1}$$

(a ∈ A, f ∈ F, a set of factor f in activities with a CES value-added production function at first-order condition)

……

Disaggregated intermediate input demand (intermediate demand for commodity c from activity a)

$$QINT_{ca} = ica_{ca} . QINTA_a$$

(a ∈ A , c ∈ C, intermediate input for commodities c from activity A)

……

Commodity production and allocation (production function for commodity c and activity a)

$$QXAC_{ac} + \sum_{h \in H} QHA_{ach} = \theta_{.c} . QA_a$$

(a ∈ A, c ∈ CX, production function for commodities c and activity A)

……

Output aggregation function

$$QX_c = \alpha_c^{ac} . \left(\sum_{a \in A} \delta_{ac}^{ac} . QXAC_{ac}^{-p_a^{aa}} \right)^{\frac{1}{p_a^{aa}-1}}$$

(c ∈ CX, aggregate commodities c with domestic production)

……

First-order condition for output aggregation function

$$PXAC_{ac} = PX_c . QX_c \left(\sum_{a \in A} \delta_{ac}^{ac} . QXAC_{ac}^{-p_a^{aa}} \right)^{-1} . \delta_{ac}^{ac} . QXAC_{ac}^{-p_a^{aa}-1}$$

($c \in A, c \in CX$, aggregate commodities at first-order condition with activity A)

……

Output transformation (CET) function

$$QX_c = \alpha_c^t . \left(\delta_c^t . QE_c^{p_c^t} + (1-\delta_c^t) . QD_c^{p_a^t} \right)^{\frac{1}{p_a^t}}$$

($c \in (CE \cap CD)$ **,** commodities c with domestic sales of domestic output and exported

Commodities)

……

Export domestic supply ratio (domestic sales and exports for outputs without both)

$$\frac{QE_c}{QD_c} = \left(\frac{PE_c}{PES_c} . \frac{1-\delta_c^t}{\delta_c^t} \right)^{\frac{1}{p_c^t - 1}}$$

($c \in (CE \cap CD)$ **,** commodities c with domestic sales of domestic output and exported

Commodities)

……

Output transformation for non-exported commodities (export supply)

$$QX_c = QD_c + QE_c$$

($c \in (CE \cap CEN) \cup (CE \cup CDN)$, commodities c with domestic sales of domestic output not in CE and exported Commodities not in CD)

……

Composite supply (Armington) function (composite commodity aggregation function)

$$QQ_c = \alpha_c^q . \left(\delta_c^q . QM_c^{-P_c^q} + (1-\delta_c^q) . QD_c^{-P_a^q} \right)^{\frac{1}{P_a^q}}$$

($c \in (CM \cap CD)$**,** commodities c with imported commodities and domestic sales of domestic output)

……

Import-domestic demand ratio (first-order condition for composite commodity cost min)

$$\frac{QM_c}{QD_c} = \left(\frac{PDD_c}{PM_c} . \frac{\delta_c^q}{1-\delta_c^q} \right)^{\frac{1}{1+p_c^q}}$$

($c \in (CE \cap CD)$**,** commodities c with exported commodities and domestic sales of domestic output at first order condition)

……

Composite supply for non-imported outputs and non-produced imports (comp supply for com without both domestic sales and imports)

$$QQ_c = QD_c + QM_c$$

($c \in (CD \cap CMN) \cup (CM \cup CDN)$, commodities c with composite supply without both domestic sales and imports)

……

Demand for transaction (trade and transport) services

$$QT_c = \sum_{c' \in C'} (icm_{cc'} . QM_{c'} + ice_{cc'} . QE_{c'} + icd_{cc'} . QD_{c'})$$

($c \in CT$, transactions service commodities)

Institution equation

Factor incomes

$$YF_f = \sum_{a \in A} WF_f . \overline{WFDIST}_{fa} . QF_{fa}$$

($f \in F$, factor f of production)

……

Institutional factor incomes (factor incomes to domestic institutions)

$$YIF_{if} = shif_{if} . \left[(1 - tf_f) . YF_f - trnsfr_{row\,f} . EXR \right]$$

($i \in INSD$, $f \in F$, a set of institution and factor f of production to domestic institutions)

……

Income of domestic, non government institutions (total incomes of domestic non-government institutions)

$$YI_i = \sum_{f \in F} YIF_{if} + \sum_{i' \in INSDNG'} TRII_{ii'} \; trnsfr_{i\,gov} . \overline{CPI} + trnsfr_{i\,row} \; . EXR$$

($i \in INSDNG$, a set of domestic income to domestic non-government institutions)

……

Intra-institutional transfers (transfers to institution on institution from institution on other institutions)

$$TRII_{ii'} = shii_{ii'} . (1 - MPS_{i'}) . (1 - TINS_{i'}) . YI_{i'}$$

($i \in INSDNG$, $i' \in INSDNG'$, transfer from institutions to institutions)

……

Household consumption expenditure

$$EH_h = \left(1 - \sum_{i \in INSDNG} shii_{ih} \right) . (1 - MPS_h) . (1 - I'INS_h) . YI_h$$

($h \in H$, a set of households h in economic activity)

……

Household consumption demand for marketed commodities (LES consumption demand by household h for marketed commodity c)

$$PQ_c . QH_{ch} = PQ_c . \gamma^m_{ch} + \beta^m_{ch} . \left(EH_h - \sum_{c' \in C} PQ_c . \gamma^m_{ch} - \sum_{a \in A} \sum_{c \in C} PXAC_{ac'} . \gamma^h_{ac'h} \right)$$

($c \in C$, $h \in H$, demand by household h for marketed commodity c)

……

Household consumption demand for home commodities (LES consumption demand by household h for home commodity c from activity a)

$$PXAC_{ac}.QHA_{a\,c\,h} = PXAC_{a\,c}.\gamma^{h}_{a\,c\,h} + \beta^{h}_{a\,c\,h}.\left(EH_h - \sum_{c'\in C} PQ_c.\gamma^{m}_{c\,h} - \sum_{a\in A}\sum_{c\in C} PXAC_{ac'}.\gamma^{h}_{a\,c'\,h}\right)$$

(a∈ A, c∈ C, demand by household h for home commodity c from activity A)

……

Investment demand (fixed investment demand)

$$QINV_c = \overline{IADJ}\ .\ \overline{qinv}_c$$

($c \in CINV$, fixed investment demand for commodity c)

……

Government consumption demand

$$QG_c = \overline{GADJ}\ .\ \overline{qg}_c$$

($c \in C$, government consumption on commodity c)

……

Government revenue (total government income)

$$\begin{aligned} YG = & \sum_{i\in INSDNG} TINS_i.YI_i + \sum_{f\in F} tf_f\ YF_f.+\sum_{a\in A} tva_a.PVA_a.QVA_a \\ & + \sum_{i\in A} ta_a.PA_a.QA_a + \sum_{c\in CM} tm_c.pwm_c.QM_c.EXR + \sum_{c\in CE} te_c.pwe_c.QE_c.EXR \\ & + \sum_{c\in C} tq_c.PQ_c.QQ_c + \sum_{f\in F} YIF_{gov\,f}.+trnsfr_{gov\,row}.EXR \end{aligned}$$

……

Government expenditures ((total government expenditures)

$$EG = \sum_{c\in C} PQ_c.QG_c.+\sum_{i\in INSDNG} trnsfr_{igov}.\overline{CPI}$$

System constraint equation

Factor market (factor market equilibrium)

$$\sum_{a\in A} QF_{f\,a} = \overline{QFS}_f$$

($f \in F$, factor f in factor markets equilibrium)

……

Composite commodity markets (composite commodity market equilibrium)

$$QQ_c = \sum_{a\in A} QINT_{c\,a} + \sum_{h\in H} QH_{c\,h}.+QG_c + QINV_c + qdst_c + QT_c\ .$$

($c \in C$, composite commodity c market equilibrium)

……

Current account balance for rest of the world (in foreign currency)

$$\sum_{c\in CM} pwm_c\ QM_c + \sum_{f\in F} trnsfr_{rowf} = \sum_{c\in CE} pwe_c\ QE_c + \sum_{i\in INSD} trnsfr_{i\,row} + \overline{FSAV}$$

……

Government balance

$$YG = EG + GSAV$$

……

Direct institutional tax rates (direct tax rate for institution to institution)

$$TINS_i = \overline{tins}_i \cdot (1 + TINSADJ \cdot tins01_i) + DTINS \cdot tins01_i$$

(i ∈ INSDNG , direct taxes on domestic non-government institutions)

……

Institutional savings rates (marginal propensity to save for institution to institution)

$$MPS_i = \overline{mps}_i \cdot (1 + MPSADJ \cdot mps01_i) + DMPS \cdot mps01_i$$

(i ∈ INSDNG , marginal propensity to save of domestic non-government institutions)

……

Savings-Investment balance

$$\sum_{i \in INSDNG} MPS_i \cdot (1 - TINS_i) \cdot YI_i + GSAV + EXR \cdot \overline{FSAV} = \sum_{c \in C} PQ_c \cdot QINV_c + \sum_{c \in C} PQ_c \cdot qdst_c$$

……

Total absorption

$$TABS = \sum_{h \in H} \sum_{c \in C} PQ_c \cdot QH_{ch} + \sum_{a \in A} \sum_{c \in C} \sum_{h \in H} PXAC_{ac} \cdot QHA_{ach} + \sum_{c \in C} PQ_c \, QG_c + \sum_{c \in C} PQ_c \cdot QINV_c + \sum_{c \in C} PQ_c \cdot qdst_c$$

……

Ratio of investment to absorption (investment share in absorption)

$$INVSHR \cdot TABS = \sum_{c \in C} PQ_c \cdot QINV_c + \sum_{c \in C} PQ_c \cdot qdst_c$$

……

Ratio of government consumption to absorption (government consumption share in absorption)

$$GOVSHR \cdot TABS = \sum_{c \in C} PQ_c \cdot QG_c$$

……

Objective function

WALRASSQR = WALRAS.WALRAS

Notational convention inside equations:

*Parameters and “invariably” fixed variables are in lower case.

*Potentially “variable” variables are in upper case.

Appendix 2: Balanced Micro SAM for Nanggroe Aceh Darussalam, 2002 and 2005

Table A2.1 Balanced Micro SAM of NAD in 2002 (in Billion Rupiah)

Aggregate Accounts	Disaggregate Accounts			No	Accounts	Production Factors			Institutions										
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						PROFF	PROFN	CAPFP	HHVPR	HHVPU	HHPRR	HHPRU	HHMIR	HHMIU	HHRPR	HHRPU	HHVRR	HHVRU	COMPY	GOVRM
Production Factors	Formal Labour			1	PROFF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Informal Labour			2	PROFN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non Labour	Capital		3	CAPFP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Institutions	Household	Poorest	Village	4	HHVPR	413.3	87.5	62.5	8.4	31.8	39.8	42.0	37.8	18.5	35.3	36.3	10.3	20.8	193.1	296.5
			City	5	HHVPU	605.4	67.4	69.3	4.9	16.5	24.7	18.8	19.4	13.2	18.1	18.8	8.5	10.3	96.6	176.5
		Poor	Village	6	HHPRR	774.5	185.2	84.8	7.3	29.6	20.7	29.7	22.9	14.0	30.4	20.8	15.9	8.8	122.8	209.9
			City	7	HHPRU	569.8	160.9	94.0	3.8	13.3	13.8	10.6	8.2	21.9	11.9	7.5	6.6	3.3	40.5	88.2
		Middle	Village	8	HHMIR	802.7	736.5	163.0	3.0	8.6	9.2	10.2	12.8	13.2	12.3	12.9	6.0	7.3	28.3	76.5
			City	9	HHMIU	711.2	931.2	178.5	3.0	9.7	13.3	9.4	9.7	12.2	9.8	9.0	4.3	4.8	41.4	57.7
		Rich	Village	10	HHRR	1030.5	351.7	207.0	1.8	4.0	8.7	5.5	4.9	12.5	8.7	4.7	3.4	1.7	30.3	24.7
			City	11	HHRU	619.1	669.2	218.4	1.3	4.0	7.0	6.5	3.3	7.9	4.5	1.7	3.0	2.6	16.4	15.5
		Richest	Village	12	HHVRR	324.1	652.4	203.1	0.8	2.3	3.7	2.7	2.6	4.3	2.5	2.5	0.6	1.6	11.8	6.6
			City	13	HHVRU	546.1	325.3	435.6	0.5	0.9	2.8	1.8	1.7	4.8	1.6	1.4	1.5	1.0	6.1	4.5
	Company			14	COMPY	0.0	0.0	10007.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	597.4	0.0
	Government			15	GOVRM	0.0	0.0	1266.8	6.3	7.9	10.7	8.6	20.1	31.8	51.7	52.9	42.3	47.3	580.4	18.7
Production Sectors	Agriculture, Plantation, & Livestock			16	AGRCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining & Quarrying			17	MINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Manufacturing			18	MINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Liquid Natural Gas			19	LNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Gasoline			20	GASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Diesel			21	DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Kerosene			22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Electricity, Gas, & Water Supply			23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Construction			24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Trade, Hotel, & Restaurant			25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Transportation & Communication			26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Financing, Real estate, & Business Services			27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Services			28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Commodities	Agriculture, Plantation, & Livestock			29	CAGRC	0.0	0.0	0.0	974.7	657.3	758.5	525.5	724.6	755.6	555.2	423.8	384.1	313.0	0.0	2.3
	Mining & Quarrying			30	CMINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.3
	Manufacturing			31	CMINCHE	0.0	0.0	0.0	674.5	466.9	638.1	294.4	610.3	532.0	534.4	500.9	308.1	380.7	0.0	65.0
	Liquid Natural Gas			32	CLNG	0.0	0.0	0.0	88.6	70.4	104.0	65.6	105.9	81.7	105.5	115.1	47.3	50.6	0.0	55.8
	Gasoline			33	CGASOL	0.0	0.0	0.0	3.6	2.9	4.2	2.7	4.3	3.3	4.3	4.7	1.9	2.1	0.0	2.3
	Diesel			34	CDIESEL	0.0	0.0	0.0	6.3	5.0	7.4	4.7	7.6	5.8	7.5	8.2	3.4	3.6	0.0	4.0
	Kerosene			35	CKEROS	0.0	0.0	0.0	3.1	2.5	3.6	2.3	3.7	2.9	3.7	4.0	1.7	1.8	0.0	2.0
	Electricity, Gas, & Water Supply			36	CELEC	0.0	0.0	0.0	5.3	5.3	4.3	2.4	7.1	5.6	5.2	5.5	2.4	3.3	0.0	23.1
	Construction			37	CCONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Trade, Hotel, & Restaurant			38	CTRAD	0.0	0.0	0.0	10.1	7.8	18.9	17.8	15.0	20.6	18.5	15.1	8.9	9.4	0.0	101.7
	Trade & Communication			39	CTRAN	0.0	0.0	0.0	83.7	77.1	122.2	64.3	118.7	132.5	89.8	99.3	59.7	58.5	0.0	203.8
	Financing, Real estate, & Business Services			40	CFINA	0.0	0.0	0.0	13.8	20.0	28.4	14.5	30.4	43.7	19.5	29.6	21.7	21.5	0.0	48.2
	Services			41	CSERVS	0.0	0.0	0.0	40.1	46.5	65.2	33.0	52.1	117.6	56.5	56.9	30.8	47.7	0.0	1215.7
Capital Balance				42	CAPAC	0.0	0.0	0.0	11.7	9.5	22.8	13.2	38.4	39.4	61.5	57.2	58.9	52.6	1451.0	14.8
Indirect Taxes Minus Subsidy				43	INDTAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of the World				44	ROW	6640.8	5305.6	13541.2	2.3	28.9	77.9	76.8	253.8	256.1	186.9	186.4	251.3	316.6	7547.7	443.5
Total					TOTAL	13037.5	9472.9	26531.5	1959.0	1528.4	2010.1	1263.0	2115.2	2151.0	1835.2	1675.1	1282.6	1370.8	10763.8	3229.7

Aggregate Accounts	No	Accounts	Production Sectors												
			16	17	18	19	20	21	22	23	24	25	26	27	28
			AGRCS	MINES	MINCHE	LNG	GASOL	DIESEL	KEROS	ELECS	CONSS	TRADS	TRANS	FINAS	SERVS
Production Factors	1	PROFF	495.2	1993.3	335.8	1706.5	69.3	121.7	59.7	12.9	194.5	316.6	262.2	69.1	666.8
	2	PROFN	2839.3	54.7	372.7	402.9	16.4	28.7	14.1	7.2	102.7	284.8	223.9	22.3	169.9
	3	CAPFP	8028.1	8256.8	1650.0	3448.5	140.0	245.9	120.7	69.8	552.8	1668.7	1444.0	271.4	140.2
Institutions	4	HHVPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5	HHVPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6	HHPRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7	HHPRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8	HHMIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9	HHMIU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10	HHRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11	HHRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12	HHVRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13	HHVRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14	COMPY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15	GOVRM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production Sectors	16	AGRCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17	MINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18	MINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19	LNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	GASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	21	DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Commodities	29	CAGRC	645.3	0.0	3238.2	20.9	0.8	1.5	0.7	0.0	81.9	18.3	0.0	0.0	8.7
	30	CMINES	0.0	1089.9	243.7	5129.0	208.3	365.7	179.6	40.8	88.1	0.1	0.0	0.0	0.0
	31	CMINCHE	961.2	0.8	399.7	49.2	2.0	3.5	1.7	3.1	416.1	665.9	152.4	2.7	96.6
	32	CLNG	211.2	2.5	91.1	489.0	19.9	34.9	17.1	34.3	183.8	380.3	398.8	3.0	29.6
	33	CGASOL	8.6	0.1	3.7	19.9	0.8	1.4	0.7	1.4	7.5	15.4	16.2	0.1	1.2
	34	CDIESEL	15.1	0.2	6.5	34.9	1.4	2.5	1.2	2.4	13.1	27.1	28.4	0.2	2.1
	35	CKEROS	7.4	0.1	3.2	17.1	0.7	1.2	0.6	1.2	6.4	13.3	14.0	0.1	1.0
	36	CELEC	4.7	0.1	15.4	49.2	2.0	3.5	1.7	5.5	2.0	19.2	9.7	1.4	73.2
	37	CCONS	76.2	11.8	0.9	8.6	0.3	0.6	0.3	1.8	6.5	278.3	40.7	16.6	13.4
	38	CTRAD	9.5	0.1	2.4	7.6	0.3	0.5	0.3	0.1	0.1	10.6	43.8	0.8	3.2
	39	CTRAN	194.0	58.3	103.1	44.6	1.8	3.2	1.6	3.6	46.3	274.2	117.0	6.1	21.2
	40	CFINA	21.7	59.2	22.2	26.7	1.1	1.9	0.9	1.5	1.9	59.0	35.3	20.8	54.9
	41	CSERVS	21.7	2.3	5.3	10.3	0.4	0.7	0.4	0.7	0.9	6.4	46.8	5.8	155.0
Capital Balance	42	CAPAC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ind.Tax-Subsidy	43	INDTAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RoW	44	ROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		TOTAL	13539.0	11530.3	6494.1	11464.9	465.6	817.5	401.4	186.3	1704.5	4038.0	2833.1	420.5	1437.0

Aggregate Accounts	No	Accounts	Domestic Commodities													Capital	Tax	ROW	TOTAL
			29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
			CAGRC	CMINES	CMINCHE	CLNG	CGASOL	CDIESEL	CKEROS	CELEC	CCONS	CTRAD	CTRAN	CFINA	CSERVS	CAPAC	INDTAX	ROW	
Production Factors	1	PROFF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6733.7	13039.5
	2	PROFN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4933.3	9476.9
	3	CAPFP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	494.7	26537.5
Institutions	4	HHVPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	625.2	1967.0
	5	HHVPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	360.0	1538.4
	6	HHPRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	432.8	2022.1
	7	HHPRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	208.6	1277.0
	8	HHMIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	212.8	2131.2
	9	HHMIU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	145.9	2169.0
	10	HHRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	135.3	1855.2
	11	HHRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.7	1697.1
	12	HHVRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.0	1306.6
	13	HHVRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.2	1396.8
	14	COMPY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	159.1	10791.8
	15	GOVRM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	978.6	105.6	3259.7
Production Sectors	16	AGRCS	13539.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13571.0
	17	MINES	0.0	11530.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11564.3
	18	MINCHE	0.0	0.0	6494.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6530.1
	19	LNG	0.0	0.0	0.0	11464.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11502.9
	20	GASOL	0.0	0.0	0.0	0.0	465.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	505.6
	21	DIESEL	0.0	0.0	0.0	0.0	0.0	817.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	859.5
	22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	401.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	445.4
	23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	232.3
	24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1704.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1752.5
	25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4038.0	0.0	0.0	0.0	0.0	0.0	0.0	4088.0
	26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2833.1	0.0	0.0	0.0	0.0	0.0	2885.1
	27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	420.5	0.0	0.0	0.0	0.0	474.5
	28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1437.0	0.0	0.0	0.0	1493.0
Domestic Commodities	29	CAGRC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	943.2	0.0	3778.5	14870.6
	30	CMINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	698.4	0.0	4922.1	13097.9
	31	CMINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186.4	0.0	2107.9	10116.5
	32	CLNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	177.7	0.0	9380.2	12408.0
	33	CGASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	380.9	567.3
	34	CDIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	0.0	668.8	948.1
	35	CKEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	328.4	502.2
	36	CELEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	329.2
	37	CCONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1312.6	0.0	0.0	1842.8
	38	CTRAD	1026.7	1348.8	1238.1	545.0	22.1	38.9	19.1	1.9	27.6	4052.9	88.6	46.0	193.1	0.0	0.0	281.5	9329.3
	39	CTRAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	929.8	0.0	0.0	0.0	-50.7	0.0	108.8	3050.5
	40	CFINA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	732.0
	41	CSERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	195.4	2296.2
Capital Balance	42	CAPAC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1462.8	3377.7
Ind.Tax-Subsidy	43	INDTAX	246.9	22.9	177.2	62.1	2.5	4.4	2.2	69.0	36.6	102.8	18.9	67.9	165.1	0.0	0.0	0.0	1064.6
RoW	44	ROW	0.0	136.0	2145.2	272.0	11.0	19.4	9.5	0.0	0.0	129.7	31.8	117.5	419.0	0.0	0.0	0.0	38494.9
Total	TOTAL		14812.6	13037.9	10054.5	12344.0	501.3	880.1	432.2	257.2	1768.8	9253.3	2972.5	652.0	2214.2	3293.7	978.6	38406.9	

Table A2.2 Balanced Micro SAM of NAD in 2005 (in Billion Rupiah)

Part 1 of 3

Aggregate Accounts	Disaggregate Accounts			No	Accounts	Production Factors			Institutions										
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						PROFF	PROFN	CAPFP	HHVPR	HHVPU	HHPRR	HHPRU	HHMIR	HHMIU	HHRPR	HHRPU	HHVRR	HHVRU	COMPY	GOVRM
Production Factors	Formal Labour			1	PROFF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Informal Labour			2	PROFN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Non Labour	Capital		3	CAPFP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Institutions	Household	Poorest	Village	4	HHVPR	532.8	157.1	216.1	86.4	65.1	118.1	59.1	133.0	66.3	125.4	91.3	47.7	93.4	329.2	521.0
			City	5	HHVPU	1133.0	170.2	236.0	29.3	19.8	42.8	15.4	39.8	27.6	37.5	27.7	23.1	27.0	149.4	165.5
		Poor	Village	6	HHPRR	1133.7	379.1	163.7	38.2	30.7	31.2	21.2	40.8	25.4	54.7	26.6	37.5	20.0	174.8	355.2
			City	7	HHPRU	792.0	296.7	221.2	12.1	8.4	12.7	4.6	8.9	24.2	13.1	5.9	9.5	4.6	51.2	74.6
		Middle	Village	8	HHMIR	810.7	988.0	205.4	19.2	10.8	16.7	8.8	27.4	28.8	26.6	19.8	17.1	19.9	33.5	258.1
			City	9	HHMIU	787.8	1361.4	302.1	11.3	7.2	14.5	4.9	12.5	16.0	12.7	8.3	7.3	7.9	48.3	74.7
		Rich	Village	10	HHRR	1102.2	518.2	365.1	9.2	4.1	13.0	3.9	8.6	22.4	15.5	6.0	7.9	3.7	34.8	31.4
			City	11	HHRU	700.9	995.4	409.1	5.3	3.2	8.2	3.6	4.5	11.1	6.3	1.7	5.4	4.7	20.0	21.0
		Richest	Village	12	HHVRR	297.6	799.4	347.5	3.7	2.0	4.7	1.6	3.9	6.6	3.8	2.7	1.1	3.1	13.1	8.1
			City	13	HHVRU	581.4	477.0	777.8	1.4	0.5	2.3	0.7	1.7	4.9	1.6	1.0	1.9	1.3	7.1	7.1
	Company			14	COMPY	0.0	0.0	12371.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	651.0	0.0
	Government			15	GOVRM	0.0	0.0	2666.2	36.6	48.2	33.3	33.9	31.7	58.4	28.2	39.9	18.4	69.1	978.4	587.6
Production Sectors	Agriculture, Plantation, & Livestock			16	AGRCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mining & Quarrying			17	MINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Manufacturing			18	MINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Liquid Natural Gas			19	LNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Gasoline			20	GASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Diesel			21	DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Kerosene			22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Electricity, Gas, & Water Supply			23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Construction			24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Trade, Hotel, & Restaurant			25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Transportation & Communication			26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Financing, Real estate, & Business Services			27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Services			28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Commodities	Agriculture, Plantation, & Livestock			29	CAGRC	0.0	0.0	0.0	1318.4	890.6	968.7	604.9	742.2	766.0	583.9	409.1	440.7	393.3	0.0	9.6
	Mining & Quarrying			30	CMINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Manufacturing			31	CMINCHE	0.0	0.0	0.0	877.9	598.3	722.7	261.1	580.5	478.8	485.4	458.4	321.9	436.8	0.0	60.1
	Liquid Natural Gas			32	CLNG	0.0	0.0	0.0	205.3	163.3	217.1	116.1	185.6	137.0	180.6	192.3	88.8	103.1	0.0	502.8
	Gasoline			33	CGASOL	0.0	0.0	0.0	7.7	6.1	8.1	4.3	6.9	5.1	6.7	7.2	3.3	3.8	0.0	18.8
	Diesel			34	CDIESEL	0.0	0.0	0.0	15.5	12.4	16.4	8.8	14.1	10.4	13.7	14.6	6.7	7.8	0.0	38.1
	Kerosene			35	CKEROS	0.0	0.0	0.0	7.0	5.5	7.4	3.9	6.3	4.6	6.1	6.5	3.0	3.5	0.0	17.0
	Electricity, Gas, & Water Supply			36	CELEC	0.0	0.0	0.0	9.0	8.9	6.8	3.5	9.1	7.0	6.8	6.6	3.4	5.2	0.0	37.8
	Construction			37	CCONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Trade, Hotel, & Restaurant			38	CTRAD	0.0	0.0	0.0	32.7	28.5	100.2	92.7	62.8	121.3	93.5	86.7	54.3	51.7	0.0	614.2
	Trade & Communication			39	CTRAN	0.0	0.0	0.0	164.5	152.0	230.6	110.5	178.1	197.9	140.1	140.8	100.7	107.9	0.0	900.0
	Financing, Real estate, & Business Services			40	CFINA	0.0	0.0	0.0	46.5	68.1	90.9	41.0	78.1	109.5	48.8	71.7	61.4	65.9	0.0	205.8
	Services			41	CSERVS	0.0	0.0	0.0	557.4	291.9	339.9	201.2	355.7	417.2	235.4	325.3	146.2	195.0	0.0	2529.5
Capital Balance				42	CAPAC	0.0	0.0	0.0	37.3	44.8	41.4	38.7	44.8	52.9	63.0	155.5	69.0	151.7	1471.6	19.0
Indirect Taxes Minus Subsidy				43	INDTAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of the World				44	ROW	2384.8	3217.7	19453.5	242.9	230.4	208.2	156.4	210.0	238.9	171.0	228.5	103.3	134.8	9447.8	342.7
Total					TOTAL	10256.7	9360.3	37735.5	3774.5	2700.5	3256.0	1800.9	2786.8	2838.2	2360.5	2333.8	1579.7	1915.2	13410.0	7399.7

Aggregate Accounts	No	Accounts	Production Sectors												
			16	17	18	19	20	21	22	23	24	25	26	27	28
			AGRCS	MINES	MINCHE	LNG	GASOL	DIESEL	KEROS	ELECS	CONSS	TRADS	TRANS	FINAS	SERVS
Production Factors	1	PROFF	601.5	1821.7	121.0	1541.6	57.5	116.8	52.2	15.2	337.2	613.7	471.0	111.6	1364.7
	2	PROFN	4101.7	48.4	183.7	335.2	12.5	25.4	11.4	8.6	162.5	565.0	461.5	32.7	349.4
	3	CAPFP	6854.2	9649.8	202.2	6515.3	243.1	493.5	220.6	87.3	786.3	4875.9	2383.3	859.0	3818.5
Institutions	4	HHVPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5	HHVPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6	HHPRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7	HHPRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8	HHMIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	9	HHMIU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10	HHRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	11	HHRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12	HHVRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	13	HHVRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14	COMPY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	15	GOVRM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production Sectors	16	AGRCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	17	MINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18	MINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	19	LNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	GASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	21	DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Commodities	29	CAGRC	1805.7	0.0	1324.0	264.0	9.9	20.0	8.9	0.0	271.6	355.3	0.4	0.0	87.8
	30	CMINES	0.0	1229.0	17.5	6125.6	228.6	463.9	207.4	49.8	902.1	0.2	0.0	0.0	0.0
	31	CMINCHE	148.1	0.2	8.0	6.9	0.3	0.5	0.2	1.1	136.8	390.0	45.5	2.9	68.9
	32	CLNG	47.5	2.6	5.6	431.3	16.1	32.7	14.6	39.2	1693.6	719.9	1238.2	10.7	47.1
	33	CGASOL	1.8	0.1	0.2	16.1	0.6	1.2	0.5	1.5	63.2	26.9	46.2	0.4	1.8
	34	CDIESEL	3.6	0.2	0.4	32.7	1.2	2.5	1.1	3.0	128.3	54.5	93.8	0.8	3.6
	35	CKEROS	1.6	0.1	0.2	14.6	0.5	1.1	0.5	1.3	57.4	24.4	41.9	0.4	1.6
	36	CELEC	1.2	0.0	1.1	33.1	1.2	2.5	1.1	3.9	9.7	24.5	18.8	3.2	17.0
	37	CCONS	22.5	7.2	0.1	5.4	0.2	0.4	0.2	1.2	35.0	334.4	74.4	34.1	4.1
	38	CTRAD	4.3	0.1	0.3	4.6	0.2	0.3	0.2	0.2	0.9	23.7	156.4	3.2	3.8
	39	CTRAN	75.6	49.5	5.5	39.0	1.5	3.0	1.3	3.5	362.6	477.4	309.9	18.1	11.6
	40	CFINA	7.7	44.4	1.7	20.7	0.8	1.6	0.7	1.2	12.4	87.1	79.3	52.8	18.9
	41	CSERVS	12.4	3.4	0.7	16.9	0.6	1.3	0.6	1.1	17.6	26.5	216.0	33.1	66.2
Capital Balance	42	CAPAC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ind.Tax-Subsidy	43	INDTAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RoW	44	ROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		TOTAL	13689.5	12856.8	1872.3	15402.8	574.8	1166.6	521.6	218.2	4977.2	8599.2	5636.7	1162.9	5865.0

Aggregate Accounts	No	Accounts	Domestic Commodities													Capital	Tax	ROW	TOTAL
			29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
			CAGRC	CMINES	CMINCHE	CLNG	CGASOL	CDIESEL	CKEROS	CELEC	CCONS	CTRAD	CTRAN	CFINA	CSERVS	CAPAC	INDTAX	ROW	
Production Factors	1	PROFF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3031.1	10258.7
	2	PROFN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3062.2	9364.3
	3	CAPFP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	746.3	37741.5
Institutions	4	HHVPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1132.4	3782.5
	5	HHVPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	556.8	2710.5
	6	HHPRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	723.2	3268.0
	7	HHPRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	261.5	1814.9
	8	HHMIR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	296.0	2802.8
	9	HHMIU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	161.3	2856.2
	10	HHRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	214.7	2380.5
	11	HHRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.5	2355.8
	12	HHVRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.8	1603.7
	13	HHVRU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.5	1941.2
	14	COMPY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	387.3	13438.0
	15	GOVRM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	664.1	2105.7	7429.7
Production Sectors	16	AGRCS	13689.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13721.5
	17	MINES	0.0	12856.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12890.8
	18	MINCHE	0.0	0.0	1872.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1908.3
	19	LNG	0.0	0.0	0.0	15402.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15440.8
	20	GASOL	0.0	0.0	0.0	0.0	574.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	614.8
	21	DIESEL	0.0	0.0	0.0	0.0	0.0	1166.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1208.6
	22	KEROS	0.0	0.0	0.0	0.0	0.0	0.0	521.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	565.6
	23	ELECS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	218.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	264.2
	24	CONSS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4977.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5025.2
	25	TRADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8599.2	0.0	0.0	0.0	0.0	0.0	0.0	8649.2
	26	TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5636.7	0.0	0.0	0.0	0.0	0.0	5688.7
	27	FINAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1162.9	0.0	0.0	0.0	0.0	1216.9
	28	SERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5865.0	0.0	0.0	0.0	5921.0
Domestic Commodities	29	CAGRC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2374.6	0.0	3454.1	17161.5
	30	CMINES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	397.8	0.0	3318.5	13000.6
	31	CMINCHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-49.8	0.0	685.0	6788.1
	32	CLNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1000.3	0.0	9228.1	16683.4
	33	CGASOL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.3	0.0	344.4	686.2
	34	CDIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.8	0.0	698.9	1326.7
	35	CKEROS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.9	0.0	312.5	632.8
	36	CELEC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	293.5
	37	CCONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4495.6	0.0	0.0	5088.8
	38	CTRAD	3301.5	50.1	4522.2	1100.4	41.1	83.3	37.3	0.0	0.0	7213.5	0.0	0.0	0.0	0.0	0.0	66.2	18028.3
	39	CTRAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1922.4	0.0	0.0	0.0	0.0	0.0	16.2	5798.1
	40	CFINA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	1303.1
	41	CSERVS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	6074.9
Capital Balance	42	CAPAC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6175.7	8449.4
Ind.Tax-Subsidy	43	INDTAX	112.4	12.2	49.3	79.6	3.0	6.0	2.7	3.3	37.7	212.8	45.2	45.1	54.9	0.0	0.0	0.0	750.1
RoW	44	ROW	0.0	21.5	282.5	36.7	1.4	2.8	1.2	0.0	0.0	4.4	38.2	15.1	73.1	0.0	0.0	0.0	37335.6
Total		TOTAL	17103.5	12940.6	6726.1	16619.4	620.2	1258.7	562.8	221.5	5014.8	17952.3	5720.1	1223.1	5992.9	8365.4	664.1	37247.6	

Appendix 3: Direct, Indirect, and Global Accounting Multipliers Effects on Income Distribution in Nanggroe Aceh Darussalam for the years 2002 and 2005

Table A3.1 Direct Accounting Multipliers Effect on Institution Income in Aceh for the year 2002 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total		
HHVPR	0.21	0.21	0.22	0.34	0.09	0.19	0.28	0.20	0.06	0.00	0.14	0.23	0.18	0.23	0.25	0.85	0.07	0.19	3.95	21.8	22.5
HHVPU	0.22	0.26	0.27	0.51	0.11	0.27	0.41	0.32	0.08	0.01	0.19	0.36	0.23	0.33	0.34	1.47	0.06	0.24	5.69	13.9	13.8
HHPRR	0.39	0.38	0.39	0.59	0.15	0.34	0.52	0.37	0.10	0.01	0.24	0.43	0.29	0.40	0.44	1.65	0.14	0.35	7.19	16.1	14.7
HHPRU	0.29	0.32	0.34	0.55	0.14	0.32	0.51	0.37	0.09	0.01	0.22	0.41	0.23	0.38	0.38	1.75	0.08	0.36	6.75	7.9	8.9
HHMIR	1.27	1.06	1.06	0.87	0.36	0.54	0.69	0.70	0.23	0.01	0.38	0.87	0.37	0.87	0.57	2.69	0.04	0.48	13.06	11.8	11.1
HHMIU	1.35	1.08	1.10	0.77	0.40	0.52	0.65	0.62	0.22	0.01	0.44	0.80	0.73	0.84	0.68	2.83	0.07	0.65	13.76	10.6	10.7
HHRR	0.68	0.62	0.67	0.82	0.35	0.53	0.74	0.46	0.15	0.01	0.48	0.64	0.61	0.77	1.10	4.86	0.07	1.60	15.18	8.0	7.0
HHRU	1.16	0.97	0.99	0.79	0.34	0.48	0.60	0.59	0.20	0.01	0.38	0.75	0.47	0.78	0.56	2.19	0.04	0.46	11.76	6.2	7.4
HHVRR	1.00	0.78	0.81	0.50	0.29	0.34	0.39	0.37	0.15	0.01	0.31	0.50	0.55	0.57	0.49	1.57	0.05	0.47	9.13	4.0	4.3
HHVRU	0.81	0.72	0.80	0.85	0.30	0.48	0.56	0.39	0.16	0.01	0.46	0.51	0.85	0.66	0.81	1.30	0.12	0.68	10.45	3.1	3.1
COMPY	10.62	10.10	11.82	12.68	3.65	5.87	5.46	4.41	1.97	0.14	5.94	6.00	7.40	9.38	9.54	1.39	0.68	6.51	113.55		
GOVRM	1.34	1.28	1.50	1.60	0.46	0.74	0.69	0.56	0.25	0.02	0.75	0.76	0.94	1.19	1.21	0.18	0.09	0.82	14.37		
M-Total	19.35	17.78	19.97	20.86	6.64	10.62	11.49	9.37	3.67	0.26	9.91	12.26	12.86	16.40	16.38	22.71	1.51	12.80			

Table A3.2 Direct Accounting Multipliers Effect on Institution Income in Aceh for the year 2005 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total		
HHVPR	0.45	0.47	0.45	0.60	0.11	0.00	0.40	0.22	0.09	0.07	0.31	0.24	0.35	0.39	0.43	0.77	0.93	0.34	6.64	21.1	21.7
HHVPU	0.60	0.74	0.73	1.09	0.20	0.01	0.72	0.50	0.19	0.14	0.53	0.50	0.54	0.71	0.68	1.59	1.14	0.49	11.08	13.5	13.3
HHPRR	0.86	0.86	0.85	0.97	0.23	0.01	0.70	0.47	0.20	0.13	0.50	0.46	0.50	0.68	0.64	1.40	1.89	0.51	11.86	15.6	14.3
HHPRU	0.56	0.65	0.65	0.85	0.18	0.01	0.66	0.43	0.15	0.12	0.44	0.42	0.40	0.60	0.57	1.39	1.19	0.54	9.80	7.7	8.6
HHMIR	2.04	1.73	1.64	0.90	0.38	0.01	0.61	0.58	0.30	0.13	0.53	0.61	0.40	1.01	0.55	1.54	0.42	0.47	13.84	11.4	10.7
HHMIU	2.47	2.02	1.90	0.94	0.47	0.01	0.67	0.56	0.32	0.13	0.68	0.64	0.87	1.13	0.76	1.76	0.76	0.72	16.80	10.2	10.3
HHRR	1.12	1.05	1.02	1.02	0.36	0.01	0.74	0.40	0.19	0.12	0.74	0.51	0.78	0.99	1.18	2.49	0.83	1.52	15.08	7.7	6.8
HHRU	2.07	1.75	1.65	1.01	0.38	0.01	0.67	0.52	0.27	0.13	0.62	0.60	0.65	1.04	0.72	1.58	0.56	0.62	14.85	6.0	7.1
HHVRR	1.51	1.21	1.13	0.58	0.26	0.00	0.40	0.26	0.16	0.07	0.44	0.33	0.61	0.67	0.56	0.98	0.51	0.53	10.22	3.9	4.1
HHVRU	1.16	1.06	0.98	1.14	0.24	0.01	0.72	0.24	0.13	0.12	0.73	0.37	1.21	0.80	1.12	1.35	1.45	0.97	13.81	3.0	3.0
COMPY	7.28	7.63	6.60	12.26	0.84	0.01	6.67	0.51	0.03	1.08	6.51	2.58	9.18	6.88	11.80	10.90	8.68	9.99	109.43		
GOVRM	1.57	1.64	1.42	2.64	0.18	0.00	1.44	0.11	0.01	0.23	1.40	0.56	1.98	1.48	2.54	2.35	1.87	2.15	23.58		
M-Total	21.69	20.80	19.03	24.00	3.83	0.10	14.40	4.80	2.04	2.47	13.45	7.83	17.48	16.37	21.55	28.09	20.23	18.84			

Note: HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), AGRCS (Agriculture), FISHS (Fishery), FORSS (Forestry), MINES (Mining & Quarrying), FOODS (Food industries), WOODS (Wood industries), CHEMS (Chemicals industries), MNMLS (Non metallic industries), TEXTS (Textile industries), BMOIS (Basic steel industries), ELECS (Electricity), CONSS (Construction) TRADS (Trade), TRANS (Transportation) FINAS (Finance), ADMNS (Administration), EDUCS (Education) PRSRS (Individual services), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Table A3.3 Indirect Accounting Multipliers Effect on Institution Income in Aceh for the year 2002 (in percentage)

Institutions	Direct Influence			Path multiplier			Total Influence			Total Influence			P	HH
	Economic Sectors in 2002 (unit)			Economic Sectors in 2002 (unit)			Economic Sectors in 2002 (unit)			Economic Sectors in 2002 (%)				
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary		
HHVPR	0.010	0.012	0.018	1.767	1.873	1.888	0.017	0.022	0.033	1.739	2.240	3.345	21.1	21.7
HHVPU	0.013	0.017	0.027	1.764	1.869	1.886	0.022	0.033	0.050	2.235	3.265	5.045	13.5	13.3
HHPRR	0.017	0.022	0.033	1.757	1.862	1.877	0.031	0.040	0.062	3.075	4.023	6.159	15.6	14.3
HHPRU	0.015	0.021	0.032	1.760	1.855	1.871	0.026	0.038	0.060	2.629	3.842	5.958	7.7	8.6
HHMIR	0.043	0.038	0.050	1.757	1.863	1.877	0.075	0.070	0.094	7.494	7.038	9.413	11.4	10.7
HHMIU	0.043	0.037	0.058	1.747	1.839	1.861	0.075	0.067	0.108	7.516	6.733	10.788	10.2	10.3
HHRPR	0.028	0.034	0.090	1.731	1.835	1.844	0.048	0.062	0.166	4.839	6.177	16.621	7.7	6.8
HHRPU	0.039	0.034	0.045	1.753	1.869	1.885	0.068	0.063	0.085	6.844	6.263	8.493	6.0	7.1
HHVRR	0.031	0.023	0.037	1.759	1.865	1.882	0.054	0.044	0.069	5.438	4.378	6.947	3.9	4.1
HHVRU	0.032	0.029	0.044	1.751	1.866	1.882	0.056	0.053	0.083	5.562	5.343	8.308	3.0	3.0
COMPY	0.452	0.334	0.349	1.768	1.878	1.903	0.799	0.628	0.664	79.932	62.804	66.408		
GOVRM	0.057	0.042	0.044	1.766	1.878	1.911	0.101	0.080	0.084	10.107	7.950	8.442		
M-Total	0.780	0.642	0.827				1.374	1.201	1.559	137.412	120.055	155.926		

Table A3.4 Indirect Accounting Multipliers Effect on Institution Income in Aceh for the year 2005 (in percentage)

Institutions	Direct Influence			Path multiplier			Total Influence			Total Influence			P	HH
	Economic Sectors in 2005 (unit)			Economic Sectors in 2005 (unit)			Economic Sectors in 2005 (unit)			Economic Sectors in 2005 (%)				
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary		
HHVPR	0.020	0.015	0.032	1.752	1.841	1.788	0.035	0.027	0.057	3.451	2.683	5.742	21.1	21.7
HHVPU	0.032	0.028	0.051	1.743	1.828	1.773	0.055	0.051	0.091	5.494	5.098	9.113	13.5	13.3
HHPRR	0.035	0.027	0.056	1.733	1.820	1.766	0.061	0.049	0.099	6.122	4.930	9.924	15.6	14.3
HHPRU	0.027	0.024	0.047	1.739	1.807	1.761	0.047	0.044	0.082	4.709	4.368	8.239	7.7	8.6
HHMIR	0.063	0.031	0.044	1.744	1.836	1.784	0.110	0.058	0.078	10.992	5.770	7.832	11.4	10.7
HHMIU	0.073	0.035	0.060	1.731	1.808	1.766	0.127	0.063	0.106	12.680	6.308	10.578	10.2	10.3
HHRPR	0.042	0.031	0.078	1.712	1.803	1.748	0.072	0.055	0.136	7.223	5.539	13.618	7.7	6.8
HHRPU	0.065	0.032	0.052	1.74	1.843	1.793	0.113	0.059	0.093	11.275	5.889	9.282	6.0	7.1
HHVRR	0.044	0.019	0.039	1.748	1.838	1.786	0.078	0.035	0.069	7.752	3.546	6.879	3.9	4.1
HHVRU	0.043	0.026	0.069	1.734	1.836	1.783	0.075	0.047	0.123	7.531	4.712	12.297	3.0	3.0
COMPY	0.338	0.182	0.574	1.754	1.851	1.810	0.592	0.337	1.039	59.238	33.732	103.949		
GOVRM	0.073	0.039	0.124	1.738	1.838	1.818	0.126	0.072	0.225	12.650	7.219	22.501		
M-Total	0.855	0.489	1.226				1.491	0.898	2.200	149.116	89.793	219.954		

Note: - HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle-income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

- Primary sector consists of Agriculture, Fishery, Forestry, Mining & Quarrying sectors; Secondary sector comprises Food industries, Wood industries, Chemicals industries, Non metallic industries, Textile industries, Basic steel industries, Electricity, and Construction; Tertiary sector encompasses Trade, Transportation, Finance, Administration, Education, and Individual services.

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Table A3.5 Global Accounting Multipliers Effect on Institution Income in Aceh for the year 2002 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total	
HHVPR	3.25	3.12	3.15	3.24	3.00	3.11	3.34	3.20	2.08	1.77	3.05	3.35	3.24	3.30	2.92	3.36	2.59	3.15	54.21	21.8	22.5
HHVPU	2.62	2.53	2.54	2.66	2.42	2.53	2.75	2.63	1.68	1.42	2.47	2.74	2.62	2.69	2.38	2.94	2.08	2.55	44.24	13.9	13.8
HHPRR	3.48	3.34	3.36	3.48	3.20	3.33	3.61	3.44	2.22	1.88	3.25	3.60	3.45	3.53	3.13	3.78	2.76	3.37	58.20	16.1	14.7
HHPRU	2.24	2.17	2.18	2.29	2.07	2.18	2.38	2.26	1.44	1.21	2.12	2.36	2.24	2.31	2.04	2.65	1.78	2.21	38.12	7.9	8.9
HHMIR	4.09	3.87	3.89	3.88	3.62	3.73	4.01	3.89	2.48	2.08	3.62	4.10	3.82	4.01	3.46	4.43	3.03	3.73	65.75	11.8	11.1
HHMIU	4.22	3.97	3.99	3.94	3.73	3.82	4.09	3.95	2.54	2.13	3.73	4.17	4.03	4.10	3.58	4.57	3.11	3.88	67.54	10.6	10.7
HHRR	3.42	3.27	3.30	3.40	3.14	3.26	3.54	3.35	2.15	1.81	3.21	3.53	3.42	3.51	3.20	4.67	2.66	3.64	58.47	8.0	7.0
HHRU	3.34	3.16	3.17	3.15	2.94	3.03	3.25	3.15	2.01	1.68	2.94	3.32	3.14	3.26	2.82	3.58	2.45	3.03	53.44	6.2	7.4
HHVRR	2.60	2.43	2.45	2.38	2.27	2.31	2.46	2.38	1.54	1.28	2.26	2.51	2.46	2.49	2.18	2.70	1.88	2.36	40.94	4.0	4.3
HHVRU	2.72	2.59	2.63	2.68	2.44	2.54	2.73	2.59	1.66	1.39	2.50	2.72	2.75	2.72	2.45	2.80	2.06	2.62	44.60	3.1	3.1
COMPY	24.63	23.55	24.19	24.85	21.47	22.54	23.91	22.79	14.42	11.94	22.19	24.00	23.74	24.59	21.83	20.80	17.63	22.69	391.76		
GOVRM	5.90	5.65	5.76	5.89	5.29	5.50	5.84	5.60	3.61	3.03	5.41	5.87	5.77	5.92	5.25	5.30	4.44	5.55	95.60		
M-Total	62.51	59.65	60.60	61.83	55.60	57.88	61.93	59.24	37.83	31.62	56.74	62.28	60.66	62.43	55.21	61.58	46.47	58.78			

Table A3.6 Global Accounting Multipliers Effect on Institution Income in Aceh for the year 2005 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total	
HHVPR	5.51	5.43	4.95	5.84	4.24	3.04	5.79	3.64	3.25	3.28	5.87	5.94	5.74	5.89	5.69	5.94	5.72	5.63	91.41	21.1	21.7
HHVPU	4.15	4.13	3.78	4.53	3.20	2.28	4.45	2.80	2.45	2.47	4.47	4.56	4.35	4.51	4.33	4.71	4.38	4.24	69.80	13.5	13.3
HHPRR	4.98	4.91	4.48	5.28	3.80	2.70	5.23	3.29	2.91	2.92	5.26	5.35	5.12	5.30	5.09	5.44	5.38	5.02	82.45	15.6	14.3
HHPRU	2.88	2.87	2.63	3.13	2.21	1.56	3.10	1.94	1.69	1.70	3.09	3.16	2.99	3.13	2.99	3.31	3.13	2.97	48.46	7.7	8.6
HHMIR	4.93	4.75	4.32	4.77	3.54	2.45	4.72	3.03	2.67	2.66	4.79	4.92	4.62	4.93	4.58	5.00	4.44	4.54	75.66	11.4	10.7
HHMIU	5.22	4.99	4.54	4.94	3.70	2.55	4.90	3.13	2.78	2.76	5.00	5.11	4.94	5.13	4.81	5.23	4.70	4.77	79.20	10.2	10.3
HHRR	3.99	3.90	3.56	4.14	3.01	2.09	4.10	2.56	2.26	2.27	4.18	4.21	4.08	4.25	4.14	4.64	3.93	4.23	65.56	7.7	6.8
HHRU	4.32	4.15	3.77	4.16	3.06	2.11	4.10	2.61	2.30	2.29	4.16	4.26	4.06	4.28	4.00	4.36	3.86	3.96	65.82	6.0	7.1
HHVRR	2.96	2.82	2.56	2.78	2.08	1.43	2.75	1.74	1.55	1.54	2.82	2.85	2.81	2.89	2.73	2.92	2.66	2.71	44.61	3.9	4.1
HHVRU	3.41	3.33	3.02	3.57	2.51	1.76	3.49	2.13	1.89	1.91	3.56	3.52	3.61	3.56	3.51	3.64	3.55	3.45	55.42	3.0	3.0
COMPY	24.51	24.25	21.90	27.43	18.01	12.81	26.08	15.19	13.55	13.99	26.50	25.81	26.49	26.39	26.90	26.95	25.29	26.20	408.23		
GOVRM	10.74	10.60	9.62	11.71	8.15	5.86	11.38	6.91	6.20	6.34	11.58	11.50	11.47	11.55	11.50	11.61	10.99	11.30	179.02		
M-Total	77.61	76.12	69.13	82.27	57.50	40.63	80.10	48.98	43.51	44.13	81.28	81.20	80.29	81.81	80.28	83.76	78.02	79.02			

Note: HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), AGRCS (Agriculture), FISHS (Fishery), FORSS (Forestry), MINES (Mining & Quarrying), FOODS (Food industries), WOODS (Wood industries), CHEMS (Chemicals industries), MNMLS (Non metallic industries), TEXTS (Textile industries), BMOIS (Basic steel industries), ELECS (Electricity), CONSS (Construction) TRADS (Trade), TRANS (Transportation) FINAS (Finance), ADMNS (Administration), EDUCS (Education) PRSRS (Individual services), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Table A3.7 Transfer Accounting Multipliers Effect on Institutions to Institutions and Economic Sectors to Economic Sectors in Aceh for the years 2002 and 2005 (in percentage)

2002 Between Institution			M-Total	2002 Between Economic Sectors			M-Total	2005 Between Institution			M-Total	2005 Between Economic Sectors			M-Total
HHVPR	-	HHVPR	0.214	AGRCS	-	AGRCS	34.154	HHVPR	-	HHVPR	1.158	AGRCS	-	AGRCS	34.710
HHVPU	-	HHVPU	0.544	FISHS	-	FISHS	30.218	HHVPU	-	HHVPU	0.367	FISHS	-	FISHS	29.588
HHPRR	-	HHPRR	0.518	FORSS	-	FORSS	31.175	HHPRR	-	HHPRR	0.481	FORSS	-	FORSS	22.753
HHPRU	-	HHPRU	0.420	MINES	-	MINES	34.560	HHPRU	-	HHPRU	0.128	MINES	-	MINES	37.553
HHMIR	-	HHMIR	0.302	FOODS	-	FOODS	27.407	HHMIR	-	HHMIR	0.494	FOODS	-	FOODS	14.015
HHMIU	-	HHMIU	0.284	WOODS	-	WOODS	30.615	HHMIU	-	HHMIU	0.282	WOODS	-	WOODS	0.146
HHRR	-	HHRR	0.237	CHEMS	-	CHEMS	33.788	HHRR	-	HHRR	0.329	CHEMS	-	CHEMS	33.018
HHRU	-	HHRU	0.052	MNMLS	-	MNMLS	29.255	HHRU	-	HHRU	0.037	MNMLS	-	MNMLS	6.315
HHVRR	-	HHVRR	0.023	TEXTS	-	TEXTS	9.538	HHVRR	-	HHVRR	0.036	TEXTS	-	TEXTS	2.402
HHVRU	-	HHVRU	0.036	BMOIS	-	BMOIS	0.362	HHVRU	-	HHVRU	0.033	BMOIS	-	BMOIS	3.139
COMPY	-	COMPY	2.854	ELECS	-	ELECS	27.591	COMPY	-	COMPY	2.488	ELECS	-	ELECS	33.792
GOVRM	-	GOVRM	0.290	CONSS	-	CONSS	32.681	GOVRM	-	GOVRM	4.134	CONSS	-	CONSS	33.478
				TRADS	-	TRADS	31.250					TRADS	-	TRADS	32.901
				TRANS	-	TRANS	34.062					TRANS	-	TRANS	35.466
				FINAS	-	FINAS	25.905					FINAS	-	FINAS	34.182
				ADMNS	-	ADMNS	29.271					ADMNS	-	ADMNS	33.340
				EDUCS	-	EDUCS	25.066					EDUCS	-	EDUCS	33.063
				PRSRS	-	PRSRS	31.979					PRSRS	-	PRSRS	32.862

Note: HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), AGRCS (Agriculture), FISHS (Fishery), FORSS (Forestry), MINES (Mining & Quarrying), FOODS (Food industries), WOODS (Wood industries), CHEMS (Chemicals industries), MNMLS (Non metallic industries), TEXTS (Textile industries), BMOIS (Basic steel industries), ELECS (Electricity), CONSS (Construction) TRADS (Trade), TRANS (Transportation) FINAS (Finance), ADMNS (Administration), EDUCS (Education) PRSRS (Individual services), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002 and 2005

Table A3.8a Open-loop Effects on Institution Income in Aceh for the year 2002 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total	
HHVPR	0.76	0.74	0.75	0.74	0.72	0.73	0.77	0.77	0.54	0.48	0.74	0.78	0.77	0.76	0.71	0.76	0.60	0.26	12.37	21.8	22.5
HHVPU	0.60	0.59	0.59	0.59	0.58	0.59	0.63	0.62	0.44	0.40	0.60	0.63	0.62	0.61	0.56	0.60	0.49	0.20	9.94	13.9	13.8
HHPRR	0.79	0.78	0.78	0.77	0.78	0.78	0.82	0.82	0.58	0.52	0.79	0.84	0.82	0.81	0.74	0.79	0.65	0.26	13.13	16.1	14.7
HHPRU	0.51	0.50	0.50	0.49	0.50	0.50	0.54	0.54	0.38	0.34	0.51	0.54	0.53	0.52	0.48	0.51	0.43	0.16	8.47	7.9	8.9
HHMIR	0.87	0.86	0.85	0.84	0.90	0.88	0.92	0.92	0.65	0.60	0.88	0.93	0.91	0.89	0.81	0.87	0.74	0.27	14.57	11.8	11.1
HHMIU	0.89	0.88	0.88	0.86	0.93	0.90	0.94	0.94	0.68	0.62	0.90	0.96	0.93	0.91	0.84	0.89	0.76	0.27	15.00	10.6	10.7
HHRR	0.76	0.75	0.74	0.73	0.77	0.76	0.80	0.81	0.57	0.52	0.77	0.81	0.79	0.78	0.71	0.76	0.65	0.23	12.71	8.0	7.0
HHRU	0.70	0.69	0.69	0.68	0.73	0.71	0.75	0.75	0.53	0.49	0.71	0.75	0.73	0.72	0.66	0.70	0.60	0.21	11.81	6.2	7.4
HHVRR	0.54	0.53	0.53	0.52	0.57	0.55	0.57	0.57	0.41	0.37	0.54	0.58	0.56	0.55	0.50	0.54	0.46	0.16	9.04	4.0	4.3
HHVRU	0.58	0.57	0.57	0.56	0.60	0.59	0.63	0.63	0.45	0.41	0.60	0.63	0.61	0.60	0.55	0.58	0.51	0.17	9.84	3.1	3.1
COMPY	4.91	4.86	4.82	4.73	5.27	5.15	5.51	5.50	3.77	3.46	5.16	5.38	5.20	5.05	4.62	4.90	4.34	1.47	84.08		
GOVRM	1.29	1.27	1.28	1.26	1.27	1.27	1.35	1.34	0.92	0.82	1.28	1.35	1.32	1.31	1.21	1.26	1.04	0.44	21.28		
M-Total	13.18	13.03	12.97	12.77	13.63	13.40	14.21	14.21	9.92	9.03	13.49	14.17	13.79	13.50	12.38	13.16	11.27	4.12			

Table A3.8b Closed-loop Effects on Institution Income in Aceh for the year 2002 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total	
HHVPR	0.45	0.45	0.45	0.48	0.42	0.44	0.47	0.45	0.41	0.40	0.43	0.46	0.44	0.46	0.46	0.61	0.42	0.05	7.74	21.8	22.5
HHVPU	0.37	0.38	0.38	0.44	0.34	0.38	0.41	0.39	0.33	0.31	0.36	0.40	0.37	0.39	0.40	0.68	0.33	0.06	6.72	13.9	13.8
HHPRR	0.51	0.50	0.51	0.56	0.45	0.49	0.54	0.50	0.43	0.41	0.47	0.52	0.48	0.51	0.52	0.82	0.44	0.09	8.76	16.1	14.7
HHPRU	0.33	0.34	0.34	0.39	0.29	0.34	0.38	0.35	0.28	0.26	0.31	0.36	0.32	0.35	0.35	0.70	0.28	0.09	6.06	7.9	8.9
HHMIR	0.75	0.70	0.70	0.65	0.52	0.56	0.60	0.61	0.49	0.43	0.53	0.65	0.52	0.65	0.57	1.10	0.44	0.12	10.57	11.8	11.1
HHMIU	0.78	0.71	0.71	0.63	0.54	0.57	0.60	0.59	0.49	0.44	0.55	0.64	0.62	0.65	0.61	1.14	0.45	0.16	10.87	10.6	10.7
HHRR	0.54	0.53	0.54	0.58	0.46	0.50	0.56	0.49	0.41	0.37	0.49	0.53	0.52	0.57	0.65	1.59	0.39	0.40	10.13	8.0	7.0
HHRU	0.63	0.58	0.59	0.54	0.42	0.46	0.49	0.49	0.39	0.34	0.43	0.53	0.46	0.54	0.48	0.89	0.35	0.12	8.71	6.2	7.4
HHVRR	0.51	0.45	0.46	0.38	0.33	0.34	0.36	0.35	0.30	0.26	0.34	0.38	0.40	0.40	0.38	0.65	0.27	0.12	6.70	4.0	4.3
HHVRU	0.48	0.46	0.48	0.49	0.35	0.40	0.42	0.38	0.32	0.28	0.39	0.40	0.49	0.44	0.48	0.60	0.31	0.17	7.33	3.1	3.1
COMPY	4.97	4.84	5.28	5.50	3.18	3.75	3.64	3.37	2.74	2.28	3.77	3.78	4.14	4.66	4.70	2.60	2.42	1.67	67.29		
GOVRM	0.99	0.98	1.03	1.06	0.77	0.84	0.83	0.80	0.72	0.66	0.84	0.85	0.89	0.96	0.96	0.70	0.68	0.21	14.75		
M-Total	11.30	10.90	11.47	11.69	8.07	9.08	9.30	8.76	7.31	6.44	8.91	9.49	9.65	10.58	10.56	12.08	6.77	3.25			

Note: HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), AGRCS (Agriculture), FISHS (Fishery), FORSS (Forestry), MINES (Mining & Quarrying), FOODS (Food industries), WOODS (Wood industries), CHEMS (Chemicals industries), MNMLS (Non metallic industries), TEXTS (Textile industries), BMOIS (Basic steel industries), ELECS (Electricity), CONSS (Construction) TRADS (Trade), TRANS (Transportation) FINAS (Finance), ADMNS (Administration), EDUCS (Education) PRSRS (Individual services), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2002

TableA3.9a Open-Loop Effects on Institution Income in Aceh for the year 2005 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total		
HHVPR	1.26	1.30	1.23	1.32	1.12	0.85	1.36	0.99	0.89	0.90	1.38	1.40	1.36	1.36	1.33	1.39	1.30	0.49	21.23	21.1	21.7
HHVPU	0.92	0.95	0.90	0.96	0.85	0.65	1.03	0.75	0.68	0.69	1.04	1.07	1.01	1.01	0.97	1.00	0.95	0.34	15.78	13.5	13.3
HHPRR	1.09	1.13	1.07	1.14	1.01	0.77	1.21	0.88	0.81	0.81	1.23	1.26	1.20	1.20	1.16	1.20	1.13	0.41	18.70	15.6	14.3
HHPRU	0.63	0.65	0.62	0.65	0.59	0.45	0.71	0.52	0.47	0.48	0.72	0.75	0.69	0.69	0.66	0.68	0.65	0.22	10.82	7.7	8.6
HHMIR	0.99	1.03	0.98	1.03	0.97	0.72	1.10	0.82	0.75	0.75	1.12	1.16	1.09	1.08	1.05	1.08	1.03	0.34	17.08	11.4	10.7
HHMIU	1.02	1.06	1.01	1.06	1.02	0.75	1.15	0.86	0.79	0.79	1.16	1.21	1.13	1.13	1.08	1.11	1.06	0.35	17.75	10.2	10.3
HHRR	0.84	0.87	0.83	0.87	0.81	0.61	0.94	0.70	0.64	0.65	0.96	1.00	0.93	0.93	0.89	0.91	0.87	0.29	14.52	7.7	6.8
HHRU	0.84	0.88	0.83	0.88	0.85	0.62	0.95	0.71	0.65	0.65	0.96	1.01	0.94	0.93	0.89	0.91	0.88	0.28	14.67	6.0	7.1
HHVRR	0.57	0.59	0.56	0.59	0.58	0.42	0.64	0.48	0.44	0.44	0.65	0.68	0.63	0.63	0.60	0.62	0.59	0.19	9.93	3.9	4.1
HHVRU	0.70	0.73	0.70	0.73	0.69	0.52	0.80	0.60	0.55	0.55	0.81	0.85	0.78	0.78	0.74	0.76	0.73	0.24	12.27	3.0	3.0
COMPY	5.07	5.26	5.02	5.26	4.96	3.77	5.95	4.33	3.94	3.96	5.99	6.26	5.64	5.71	5.37	5.48	5.28	1.71	88.98		
GOVRM	2.30	2.38	2.25	2.43	2.10	1.57	2.59	1.83	1.65	1.67	2.62	2.68	2.54	2.53	2.46	2.53	2.39	0.92	39.46		
M-Total	16.25	16.82	16.01	16.93	15.55	11.70	18.44	13.46	12.27	12.35	18.65	19.32	17.93	17.99	17.20	17.68	16.86	5.78			

Table A3.9b Closed-Loop Effects on Institution Income in Aceh for the year 2005 (in percentage)

Institutions	Economic Sectors																		P	HH
	AGRCS	FISHS	FORSS	MINES	FOODS	WOODS	CHEMS	MNMLS	TEXTS	BMOIS	ELECS	CONSS	TRADS	TRANS	FINAS	ADMNS	EDUCS	PRSRS	M-Total		
HHVPR	0.72	0.73	0.72	0.76	0.64	0.61	0.71	0.67	0.63	0.63	0.69	0.67	0.70	0.71	0.72	0.80	0.84	0.09	12.04	21.1	21.7
HHVPU	0.58	0.62	0.62	0.70	0.48	0.43	0.61	0.56	0.48	0.47	0.57	0.56	0.57	0.61	0.60	0.83	0.72	0.12	10.13	13.5	13.3
HHPRR	0.74	0.74	0.73	0.77	0.58	0.52	0.70	0.64	0.57	0.55	0.65	0.64	0.65	0.70	0.68	0.87	1.00	0.13	11.85	15.6	14.3
HHPRU	0.43	0.45	0.45	0.50	0.33	0.29	0.45	0.39	0.33	0.32	0.40	0.39	0.39	0.44	0.43	0.63	0.59	0.13	7.35	7.7	8.6
HHMIR	0.96	0.88	0.86	0.67	0.54	0.45	0.60	0.59	0.52	0.48	0.58	0.60	0.55	0.70	0.59	0.83	0.55	0.12	11.07	11.4	10.7
HHMIU	1.07	0.96	0.93	0.69	0.57	0.46	0.62	0.60	0.53	0.49	0.63	0.61	0.67	0.74	0.65	0.89	0.64	0.18	11.93	10.2	10.3
HHRR	0.66	0.64	0.64	0.63	0.47	0.38	0.56	0.48	0.43	0.41	0.56	0.51	0.57	0.63	0.68	1.00	0.58	0.38	10.21	7.7	6.8
HHRU	0.89	0.81	0.79	0.62	0.47	0.37	0.54	0.50	0.44	0.40	0.53	0.52	0.53	0.64	0.55	0.77	0.51	0.16	10.05	6.0	7.1
HHVRR	0.63	0.56	0.53	0.40	0.32	0.25	0.35	0.32	0.29	0.27	0.36	0.34	0.41	0.42	0.39	0.50	0.38	0.13	6.84	3.9	4.1
HHVRU	0.60	0.57	0.55	0.59	0.37	0.31	0.49	0.37	0.34	0.34	0.49	0.40	0.61	0.51	0.59	0.64	0.67	0.24	8.65	3.0	3.0
COMPY	4.06	4.15	3.89	5.33	2.40	2.19	3.90	2.32	2.20	2.47	3.86	2.85	4.54	3.97	5.23	4.98	4.42	2.56	65.32		
GOVRM	1.64	1.66	1.60	1.92	1.27	1.23	1.60	1.26	1.23	1.29	1.60	1.37	1.74	1.63	1.90	1.84	1.72	0.56	27.04		
M-Total	12.97	12.75	12.31	13.59	8.44	7.50	11.14	8.69	7.99	8.10	10.91	9.46	11.92	11.70	13.00	14.60	12.62	4.80			

Note: HHVPR/U (Very poor household in rural/urban), HHPRR/U (Poor household in rural/urban), HHMIR/U (Middle income household in rural/urban), HHRR/U (Rich household in rural/urban), HHVRR/U (Very rich household in rural/urban), COMPY (Company), GOVRM (Government), AGRCS (Agriculture), FISHS (Fishery), FORSS (Forestry), MINES (Mining & Quarrying), FOODS (Food industries), WOODS (Wood industries), CHEMS (Chemicals industries), MNMLS (Non metallic industries), TEXTS (Textile industries), BMOIS (Basic steel industries), ELECS (Electricity), CONSS (Construction) TRADS (Trade), TRANS (Transportation) FINAS (Finance), ADMNS (Administration), EDUCS (Education) PRSRS (Individual services), M-Total (Sum Total of Accounting Multipliers), P (Population), and HH (Household)

Source: Own calculation based on Social Accounting Matrix Data of Aceh, 2005