A COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR INDONESIA: IMPACTS OF STRATEGIC REFORM POLICIES

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TABLE OF CONTENTS

Chapter Page

Chapter Page

Chapter Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Problem Statement

During 1991 - 1993, the average ratio of the present value of Indonesia' s total debt services to its exports of goods and services was 192 percent (The World Bank, 1995). Its total external debt was 222 percent of the exports of goods and services. Both of Indonesia's debt indicators were higher than those of Mexico (183 and 189 percent, respectively). Indonesia and Mexico were moderately indebted middle income countries.[1] Mexico's gross national product per capita in 1993 was more than four times that of Indonesia. Mexico experienced another debt crisis in 1995. Because of its debt condition, the government of the Republic of Indonesia (GRI) continually needs to implement macroeconomic policies that can prevent debt repayment problems. The GRI also needs to have a rescue plan in case the economy faces another debt crisis.[2]

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[1]The moderately indebted middle income country has either ratio of present value of total debt services (PV) over gross national product (GNP) or PV over exports of goods and services (XGS) that is 60 percent or more of the critical value (The World Bank, 1995).

[2]This was supposed to be a hypothetical situation. The study was designed in 1996, but the real crisis started in August 1997, after a debt repayment problem in Thailand. The GRI contacted the International Monetary Fund (IMF) in October 1997 and signed "the letter of intent" (to follow the IMF stabilization package) in its agreement with the IMF on January 15, 1998.

There were at least four reasons why the GRI needed to have the rescue plan. First, the economy seems to experience debt crises every ten years (in 1966, 1976 and 1986). Second, as a small and open economy, Indonesia is vulnerable to external shocks such as hard currency realignment, changes in world interest rates and prices of its main export commodities such as oil.[3] The economy was becoming more vulnerable to external shocks. For example, in October 1991, the GRI learned that the economy may experience a debt crisis if its private sector continues to accumulate short term offshore loans excessively. More vulnerability of the economy and other similarities with the condition of Mexico before its 1995 crisis are discussed in Chapter II. Third, a combination of various internal and external factors may lead to a depreciation of the rupiah and the depreciation may trigger difficulties in repaying external debts. Among those factors are: (1) liberalization pressures to follow the ASEAN Free Trade Area (AFTA)'s schedule;[4] (2) substantial and growing current account deficits; and (3) speculation about the new president in 1998.[5] Meanwhile,

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[3]Indonesia has diversified export commodities. The exports of oil and 9 other main commodities account for more than 90 percent of the total exports. Remarkable increases in the non oil exports were accompanied by higher rate increases in total imports such that the balance on goods and services was always negative. More details about the economy are discussed in Chapter II.

[4]ASEAN is Association of Southeast Asian Nations. AFTA was established on January 28, 1992, because heads of state of ASEAN perceived a more integrated ASEAN would help increase the bargaining position of the region and enhance the attractiveness of the ASEAN market (Chiew, 1997, p.3). The decision was made when the market reforms of the former centrally-planned Eastern European economies and other developing countries such as Latin America and China posed as direct competitors with the ASEAN member countries for international investment inflows. According to Chiew, AFTA was formed to help the region face the prospects of a single unified market in the European Community, the likely formation of the North American Free Trade Area, the increasing bilateralism and the slow progress of the multilateral trade talks (1997, p.3).

[5]The GRI scheduled general election to choose members of Parliament in 1997. Parliament will then elect a president and a vice president. The author witnessed some riots and explicit popular discontent towards the president of Indonesia during her visit to

it is anticipated that the AFTA members and some other developing countries, such as China and Vietnam, will devalue their currencies to gain better access to the regional market. Together with its inflation rate which is higher than those of most of its trading partners, the current account deficits created pressure for devaluation of the rupiah. The build-up of unsustainable economic imbalances and misalignments in asset prices or exchange rates are known as common origins of various types of economic crises (IMF, 1998, p.111). Despite the above pessimistic views about Indonesia, the IMF was amazed with the Indonesian condition until two months before its 1997 crisis.[6] Their optimistic view was mainly caused by the economy's average growth rate of the real gross domestic product of more than 7 percent during 1973 - 1996.

The GRI has taken structural adjustment loans from the International Financial Institutions (IFIs), IMF and the World Bank, and consulted the institutions every year since its first debt crisis. Therefore, it is possible that when it faces another debt repayment problem, which may be originated by the private sector, the GRI will come to the IMF.[7] The typical IMF policies for countries with balance of payments problems are known as

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Indonesia (June - August 1996). Soeharto was the president since 1966. He was appointed again as the president for 1998 -2003, with B.J. Habibie as the vice president. Habibie is the current the president after Soeharto resigned in May 1998.

[6]At the end of 1996 the IMF predicted 8.0 percent real GDP growth with 7.3 percent changes in consumer prices for 1997 and increases world export market shares from 0.9 percent to 1.0 percent for 1997 and 1998 (IMF, 1997, p.30 and 40). The prediction was published in May 1997. Mexico was also a "darling" to the International Monetary Fund (IMF) and the World Bank moments before the 1995 - 1996 crisis (Sachs et al., 1996, p.268). This similarity is not discussed in Chapter III.

[7]Indonesia is a lower middle income country; therefore, in the next debt crisis the GRI will have to take the regular facility offered to middle and high income countries. With that facility, the loan has variable interest rates and fewer concessionary components when compared with the IMF loans it took in 1986 as a low income country.

stabilization and reform policies or structural adjustment policies. They are referred to as standard reform policies in this study.[8] Among the standard policies are contractionary fiscal and monetary policies, liberalization of the real (trade and investment) and financial sectors, relative price adjustment, and devaluation (Dornbusch and Fisher, 1994; Jayarajah and Branson, 1995; Schadler, 1995). The study reviews the standard policies and tries to answer the following questions: (1) Should the GRI take the IMF stabilization policies with its conditionality as granted? (2) Would its standard policies help the economy?

There are two reasons for suspecting that the standard policy would be ineffective in helping the economy. First, the GRI has special ways of measuring the unemployment and inflation rates such that when the GRI cuts food and fuel subsidies and increases interest rate as parts of the standard policies, the unemployment and inflation rates will become higher. Second, the term structural adjustment in the course of the 1980s is misleading, according to Keyzer, Veen, and Tims, because the Indonesian economy remains largely driven by external influences in an essentially colonial manner rather than by domestic initiative to diversify the structure of supply (1992, p.117).[9]

Providing employment for its fast-growing labor force is a huge problem for the GRI.

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[8]The terminology is used by Feld, Jordan and Hurwitz who predicted that the policy imposition will not change considering the distribution of weighted voting right in the IMF (1988, p.138). Various IMF facilities are shown in Appendix B: Table 1. More reasons for referring the policy as the standard policy are explained in Chapter III.

[9]Their analysis is requested by Thorbecke as a contribution to his case study for the Organization for Economic Cooperation and Development (OECD) Development Center. They used a CGE model which they developed for over four years at the Center for World Food studies (SOW) in Amsterdam in cooperation with the Economic Statistics Analysis Division of the Indonesian Central Bureau of Statistics and, during the development of the static model version, with the Institute of Social Studies in The Hague. The agricultural sector in their model is disaggregated into 27 sectors. The model does not have a financial sector.

The problem exists because Indonesia has more than half the total population of the five ASEAN countries combined (see Table 1.1). In 1992 the Indonesia population was 184.3 million and had the lowest per capita income among the original members of ASEAN (see Table 1.1). Indonesia's labor force growth is 2.0 percent annually for the period of 1992 - 2000. This growth rate was lower than those of Malaysia and the Philippines (see Table 1.1). However, Indonesia's labor force (81 million in 1992) was more than 5 times Malaysia's total population and was larger than the Philippines' total population.

TABLE 1.1

OVERVIEW OF ASEAN FREE TRADE AREA MEMBER COUNTRIES

	Country	Membership		GDP 1992	Labor force growth	Population (mid 1992)	Income per capita
		ASEAN	WTO	million ($)	1992 - 2000 (%)	million (person)	1992 ($)
1	Indonesia	1967	yes	126,364.00	2.0	184.3	670
2	Malaysia	1967	yes	57,568.00	2.5	18.6	2,790
3	Philippines	1967	yes	52,462.00	2.3	64.3	770
4	Singapore	1967	yes	46,025.00	0.6	2.8	15,730
5	Thailand	1967	yes	110,337.00	1.5	38.4	1,840
	ASEAN 5			392,756.00		328.4	

Source: Nguyen, 1997, p.3 (modified with more recent data).

The seriousness of the unemployment problem is also covered by the GRI's way of defining employed person. The GRI defines "people who work for their families without being paid" as employed persons. These people do not look for jobs because they are being taken care of by their families. The number of people who worked for their families without being paid for 1990 - 1993 was larger than those with self-employed status (see Appendix A: Table 1).

If the people who worked for their families without being paid were categorized as unemployed, then the total number of the unemployed Indonesians was larger than the Malaysian population. In a worse economic condition, many of the people who previously work for their families without being paid will look for paying jobs, because some of the families cannot afford to continue taking care of them. If the GRI adopts policies that increase interest rates and reduce aggregate demand, more firms will discharge their employees in order to stay alive or because the firms can no longer do business.

When measuring the consumer price index, the GRI puts much more weight on the prices of staple food (rice) than it does on the individual prices of other commodities. The price of rice is subsidized by the GRI. The GRI imports some of the rice from abroad. With a devaluation of the rupiah, moreover, when the subsidy is also lifted with the standard policy, it is expected that the inflation rate will be roaming. The inflation rate was 8.64 percent in 1996 (see Appendix A: Table 2).[10]

Indonesia was considered successful in implementing structural adjustment (stabilization and reform) policies during its 1986 - 1990 balance of payment problems. However, according to Keyzer, Veen, and Tims, the GRI should review its previous experiences, particularly the effects of those policies (1992, p.118). Keyzer, Veen, and Tims notice that at the same time, the other Asian countries show more initiative and drive in the direction of diversification (1992, p.118). They conclude that Indonesia's chances to join them may in fact be hampered because countries in the region want to rely more on Indonesia as a main supplier of raw materials (particularly of a non-renewable kind) and

[10]It is much lower than the rate experienced by other countries helped by the IMF with the standard policy.

pursue their competitiveness in manufactured goods markets, including Indonesia's own domestic markets. Therefore, the Indonesian economy must move from non-renewable exports to renewable ones, and particularly to more labor intensive products, both domestically and in trade. Keyzer, Veen, and Tims suggest that when skills are enhanced, the export structure should follow that lead toward more skill intensive goods and services. Keyzer, Veen, and Tims warn that the longer the country fails to make significant progress in this direction, the more difficult it will become to make this transition (1992, p.118).

Purpose of the Study

The purpose of this study is to develop a computable general equilibrium model (CGE) to simulate the impacts of liberalization of the real sector and some other policies included in the standard policies, and implementation of strategic reform policies.

Liberalization of the Real Sector

The government of the Republic of Indonesia implemented series of wide scale deregulations of investment and financial sectors during 1988 - 1990. The financial sector liberalization had preceded real sector reform in a reverse sequence and at a faster speed than recommended by the World Bank in the 1989 World Development Report (Pangestu, 1996, p.34). The GRI scheduled trade liberalization in accordance with AFTA for 1995 and 1998.

AFTA is the most comprehensive arrangement yet to promote regional trade that has a timetable to eliminate tariffs under the Common Effective Preferential Tariff (CEPT) by

the year 2008, later shortened to 2003. Table 1.2 shows that when AFTA was first announced, all tariffs were to be reduced to 0 - 5 percent within 15 years and all nontariff barriers were to be dismantled among the ASEAN members within eight years beginning January 1, 1993. Trade liberalization is planned to proceed along two lines, normal and fast tracks. Under the "Normal Track," tariffs of more than 20 percent will be reduced to 0 - 5 percent in 15 years, while present tariffs of 20 percent or less will be pared down to 0 - 5 percent in 10 years. The CEPT was initially restricted to manufactured and processed agricultural products. At subsequent economic ministers' meetings, a number of measures were taken to reduce exclusions and extend the commodity coverage to service, and to bring forward the timetable to achieve a free trade area. Under the framework of the agreement, members also agreed to eliminate quantitative restrictions and non-tariff barriers on trade products in the CEPT and to cooperate in some areas of service trade.

TABLE 1.2

AFTA'S LIBERALIZATION SCHEDULES

Duration of tariff reduction (to 0 - 5 percent)					
	Initial plan		Normal track (2 types)	Fast track	
				I	II
Tariff rates over 20 %	15 years	I	15 years (2 stages)		10 years
		a	5-8 years (to 20%)		
		b	7 years (to 0-5 %)		
Tariff rates under 20%	15 years	II	10 years	7 years	
Nontariff barrier	8 years (among ASEAN members)				
Starting date	January, 1993		Malaysia 1993 Brunei 1994 Indonesia 1998 Thailand 1999 Philippines 1996	Malaysia 1995 Brunei 1994 Indonesia 1995 Thailand 1995 Philippines 1996	
Finishing date	2008		2003	2003	

Source: Summarized from Chiew, 1997, p.4.

With regard to liberalization on investment, financial and real sectors, it is relevant to inform also that all ASEAN members joined the World Trade Organization (WTO), see Table 1.1. According to Nguyen, this dual status means the ASEAN members must fulfill their WTO obligations to all WTO members as well as their AFTA obligations to other ASEAN members (Nguyen, 1997, p.3). Both AFTA and WTO adhere to the principle of most-favored-nation (MFN) and national treatment. MFN requires all members be treated equally so that "no other countries will be treated more favorably." National treatment requires all nationals of members be treated equally so that "foreigners are treated no less favorably than own nationals" (Nguyen, 1997, p.3). While bilateral arrangements are generally not allowed under WTO, ASEAN recognizes that sub-regional arrangements

either among members only or even between members and non members could complement the overall ASEAN cooperation effort. In other words, WTO and AFTA are complementary to, instead of substitutes, for each other.

Standard and Strategic Reform Policies

We design the strategic reform policy with four considerations. *First*, in the long term the Indonesian economy needs to reduce its dependence on its public sector as well as on foreign creditors to lead the development; therefore, it is important that the GRI prevents the next crisis from terminating previously healthy domestic firms. Such termination would happen if the GRI implement contractionary monetary policy that raises interest rates and decreases credit availability suggested in the typical IMF policy package. *Second*, to enable both sectors to service their external debts, the GRI and the private sector cannot afford either to lose export markets and more of its domestic market nor to make another huge borrowing. The standard policy has contractionary fiscal and monetary policy elements that increase production (capital) cost and decrease aggregate demand. Production of domestic and export commodities might be disturbed by the policy. It then promotes and prolongs recession. Another huge borrowing will come with higher charges, which will burden the government account and may discourage private agents from taking investment projects because they anticipate the GRI will increase tax rates in the debt repayment period. Third, also for the long term benefit of the country, the GRI should insulate the poor from the coming external shock and sustain the health and education entitlements of the poor. For example, in the standard policy the government cuts fuel and food subsides, in the strategic

policy, the subsidies are maintained in order to control inflation rates, and the priorities are on cutting the two largest government expenditures (personnel and interest expenditures). *Fourth*, there are some inherent contradictions among the components of the standard policy. Detailed reviews of the standard policies are presented in Chapter III. Other components of the strategic policies which are not found in a typical IMF policy package are social consensus and multilateral adjustment. The two ingredients are needed because the government is already unpopular, moreover, they are needed to carry politically unpopular standard policies, and because the stabilization and reform would be much more likely to succeed if the surplus countries help the adjustment process. In short, the strategic reform policy is based on the unique condition of the country and care for the structural condition. The strategic policies are aimed at helping the private sector solve its debt repayment problem and decreasing the current account deficit as well as influencing the decisions for saving and investment. Keyzer, Veen, and Tims observe that one feature of the Indonesian economy which seems to go together with its present dependent state is a sizeable flow of resources, which is only partly identified with factor payments to abroad. The flow constitutes a significant part of domestic saving and reduces the scope for balance of payment management. They acknowledge that the measures taken to cope with the external shocks in recent years did not affect this resource outflow, but these measures might have been much less severe if these flows had not existed. According to Keyzer, Veen, and Tims payments to abroad are thus part of the country's vulnerability, and they add to arguments for a more active policy which strengthens domestic activity and policy as the driving forces for economic transformation (1992, p.119). The derivation of the strategic policies will be presented in Chapter III.

Objectives of the Study

The general objective of this study is to develop a computable general equilibrium model that captures the relationships between trade, investment, debt and other variables in the Indonesian economy. The specific objectives are to simulate the implementation of the IMF standard policies and the strategic reform policies and to compare results.

Method and Procedure

The study is forward-looking because it concerns a possible future debt crisis. Part of the analysis will utilize a computable general equilibrium (CGE) model that is based on a social accounting matrix (SAM) for Indonesia, 1990. The model for this study follows the basic guidelines for developing a general macroeconomic CGE model suggested by Dervis, de Melo and Robinson (1982). The model is a disaggregated model with 22 production sectors, but it is also a simple model that captures basic investment, trade and debt relationships at the aggregate level. A simple monetary sector is represented in the model. Because of its simplicity, some flexibility will be sacrificed (Dervis, de Melo and Robinson, 1982). The model uses some basic assumptions: Indonesia is an open but small economy such that its export demand is the same as its export supply; the export supply function is determined through a constant elasticity of transformation and depends on the ratio of domestic price to the world price of the export good; saving and investment functions are affected by interest rates that will be determined by the relative purchasing power parity relationship. The equations represent relationships described in the model and

will be solved simultaneously. To solve the model, parameter values are either taken from previous studies or calibrated. The calibration requires some exogenously specified parameter values, because for some equation sets the number of parameters exceeds the number of equations. Exogenously specified parameters for this model include elasticities of the various constant elasticity of substitution (CES) functions, and constant elasticity of transformations (CET) for each section.

The CGE model assumes that the economy is in equilibrium in the base year. Therefore, the model should reproduce base year data of the SAM before it can be used for simulating policies. Starting in 1975, the Indonesian Central Bureau of Statistics (BPS) published a SAM for Indonesia every five years. Ideally, this study would use SAM 1995; however, that is not possible because even the Indonesian Input Output Table 1995 was not available at the time of the study. The SAM contains 106 rows and 106 columns, which are broken down into the following accounts: factors of production, institutions, production sectors, commodities, trade and transport margins, capital, indirect tax and rest of the world.

Organization of the Writing

This study will be presented in six chapters. Chapter II discusses certain conditions of the Indonesian economy during 1990 - 1996. It focuses on the economy's dependence on foreign investment and external debt to cover its current account deficits. Its current account and other components of Indonesia's balance of payments are discussed with rather pessimistic views to show a possibility of having another debt repayment problem.

Chapter III presents a derivation of the strategic reform policies after a review of literature that has been critical of the standard policy. Chapter IV addresses the SAM structure and relationships in the computable general equilibrium model for this study. It also presents a CGE solution for the base run. Chapter V discusses simulation scenarios and their results. Chapter VI summarizes the previous chapters, concludes some policy implications and explains limitations of the study.

CHAPTER II

INDONESIAN ECONOMY: POTENTIAL DEBT REPAYMENT PROBLEM

This chapter provides a description of certain conditions in the Indonesian economy that make it vulnerable to external shocks. The economy is vulnerable in that any unexpected news such as lower oil prices, higher interest rates and recession in major developed countries or large currency realignment might easily trigger a potential debt crisis. This vulnerability is deduced from similar conditions in another indebted country, Mexico, before it experienced debt crisis in 1995 (summarized from Atkeson and Rios-Rull, 1995; Sachs, Tornell and Velasco, 1996; Jeanne, 1997 and other literatures). Mexico is chosen for the comparison because it experienced repeated crises but it is widely cited as the most successful example of a country helped by the IMF stabilization package. Our description focuses on changes in foreign capital inflows, depreciation of the Indonesian rupiah, and some other factors related to reforms that the Indonesian economy underwent from 1986 to 1988. The chapter begins with a summary of previous debt crises and their main causes to illustrate "mistakes" which were supposed to be avoided in the post reform period. The second section discusses uncertainty of foreign investment flows and its impact on the balance of payments. The third section concentrates on the current account balance. The fourth section is about depreciation of the Indonesian rupiah, and its causes and effects related to the accumulation of external debts. The fifth section discusses the GRI's budget

deficit and its limited fiscal maneuver ability because of its external debt burden. Also, discussed in the section is a special relationship between the GRI with its main creditors. The last section provides conclusions and some policy implications.

Previous Debt Crises

The Indonesian economy has experienced several debt crises. The first one was in 1965 - 1966, when its total debt was only $2.4 billion but was 524 percent of exports (Hill, 1996, p.5). The causes were excessive government consumption expenditures relative to its revenue and import substitution orientation of the economy. Inflation was more than 636 percent for that year (Little, et al., 1993, p.410). The second crisis happened in 1976 when PERTAMINA, the state oil company, could not refinance its short term debt. PERTAMINA borrowed substantially and used its external public guaranteed borrowing largely to build housing and other facilities for its employees. Inflation was 40.6 percent for that year (Little, et al., 1993, p.410). The economy hit by severe external shocks and almost experienced another crisis in 1986. The GRI's disbursed and outstanding foreign debts, which was mostly denominated in Japanese Yen, roughly doubled between 1983 and 1987 (The World Bank, 1994, p.186 - see Appendix A: Table 3). Japan has always been the largest creditor, foreign direct investor and the main source of import commodities for Indonesia. The total debt was almost $40 billion or 250 percent of its exports after a rapid decline of the world price of oil, sharp appreciation of Yen and a negative net transfer that resulted in a huge current account deficit (Hill, 1996, p.71). Unlike many other developing countries, such as Mexico and Brazil, Indonesia did not ask for a debt moratorium

(reduction). The GRI managed to pay its obligation on schedule.

Uncertainty of Foreign Investment Flows

Foreign investment made a significant contribution to economic recovery in the late 1960s and 1980s and to export growth after 1988 (Pangestu 1996, Woo, Glassburner and Nasution 1994). However, foreign investment flows have fluctuated considerably. They were negative in 1974 and jumped sharply in 1975 (Hill, 1994, p.76). Despite its rather similar sectoral composition (excluding oil, liquid natural gas and finance) with domestic investment, total foreign investment decreased after a boom in 1992 (Pangestu, 1996, p.166). Table 2.1 shows the approval figures for foreign investment. The table does not show the actual foreign investment figures which were smaller than the approved ones. A large gap between realized and approved foreign investment happened in 1982, 1983 and 1993 because many heavy industry programs were delayed. Approved foreign investment increased its importance slowly to the same level of the domestic investment in 1994 (Pangestu, 1996, p.166). Table 2.1 shows that the approved foreign investment sharply increased in 1994 - 1996.

TABLE 2.1.

INVESTMENT APPROVAL AND CAPITAL FLOWS (US$ MILLION)

	1990	1991	1992	1993	1994	1995	1996
Domestic investment approval	30,662.2*	21,065.6*	14,454*	18,975.7*	24,625.3*	30,626	42,264
Foreign investment approval	8,751.1*	8,778*	10,323*	8,144.2*	23,724.3*	39,915	29,931
Direct investment	1,092	1,482	1,777	2,003	2,108	4,346	5,949
Official capital (net)	633	1,419	1,112	743	307	336	(440)
Private capital (net)	4,113	4,410	5,359	5,219	3,701	10,253	10,942
Capital flight[1]	(593)	230	1,606	2,923	242	2,313	(1,678)

Note: 1. From error and omissions in the balance of payments. Negative = () is for capital inflows
Source: BPS, various years; *. Pangestu, 1996, p.166.

An observation by Hill revealed that over 24 years from 1969 to 1992 foreign investment flows have exceeded one percent of the domestic capital formation only six times, three in the years 1990 to 1992 (Hill, 1994, p.76). Hill concluded that "neither, in comparative international perspective has Indonesia been a large recipient of foreign investment"(Hill, 1994, p.78).

Until 1992 the flows were mostly from public sources. However, net private flows to Indonesia sharply increased to $7.7 billion in 1994, from $1.1 billion in 1993. The increase continued in 1995 and 1996, $11.6 billion and $17.9 billion respectively (The World Bank, 1997, Vol. I, p.7).

In its study about sustaining development in Indonesia, the World Bank suggested

that the GRI build more infrastructure to attract foreign capital and to support domestic entrepreneurs and manufacturing to compete in the global market (The World Bank, 1994, p.104). Infrastructure development is especially needed to attract investment in the higher technological industry so that Indonesia can diversify from resource based and labor intensive production (Thee 1995, Mangkusuwundo 1995). In addition, the World Bank suggests that the infrastructure development should no longer be financed by external loans (The World Bank, 1994, p.104).

Foreign Direct Investment

The role of the foreign direct investment (FDI) in the Indonesian economy up until 1992 was very small: 2.0 percent of the domestic capital formation or 1.4 percent of the GDP (Table 2.2). Direct foreign investment was still a small part of the development fund except in 1992 to 1993 when 100 percent foreign ownership was permitted (Pangestu, 1996, p.166). Hill determined that as a percentage of capital formation, in most years the numbers were less than 4 percent (Hill, 1994, p.76).

Compared to other ASEAN members and China, FDI inflows to Indonesia were second to the least after the inflows to the Philippines (Table 2.2).

TABLE 2.2.

FDI INFLOWS TO SELECTED ASIAN COUNTRIES

Economy	1986-90	1991	1992	1986-1990 % Gross domestic capital formation	1992 % GDP
	Annual average value (US$ million)				
China	2,853	4,366	11,156	2.1	2.20
Indonesia	599	1,482	1,774	2.0	1.4
Malaysia	1,126	3,998	4,469	10.6	7.7
Philippines	493	544	228	6.8	0.43
Singapore	3,247	4,395	5,635	33.9	11.61
Thailand	1,188	2,014	2,116	5.9	1.91

Source: Pangestu, 1996, p.173 (Tables 7 and 8).

Since 1993 the pouring of portfolio equity flows to the economy has been larger than those of FDI (see Table 2.3). Table 2.3 shows that the portfolio flows were $2,452 million in 1993, more than 12 times their magnitudes in 1992. The figures were even larger for 1995 and 1996, $3,672 million and $4,873 million, respectively.

International bond issuance recorded its peak level in 1996 (The World Bank, 1997, Vol I, p.100). According to the World Bank, low yields in industrial countries coupled with investor interest to diversify their portfolios toward developing countries are the main factors that pushed debt flows to a record $89 billion in 1996 (The World Bank, 1997, Vol I, p.100). The flows of the portfolio (debt and equity), which sometimes are also referred to as "hot money," are easily affected by any news and largely depend on investor interest as well as what happens in industrial countries. For example, as soon as the news about the assassination of the presidential candidate in Mexico appeared their equities were treated as worthless papers by the foreigners who bought them so eagerly before (Atkeson and Rios-

Rull, 1995, p.342).

TABLE 2.3

AGGREGATE NET RESOURCE FLOWS AND NET TRANSFERS
1970 - 1995 (US$ MILLION)

	Net resource flows				Net transfers		
	Net flows on long term debt (1)	FDI Net (2)	Portfolio equity flows (3)	Grants (4)	Interest on long term debt (5)	Profit re-mittances on FDI (6)	Net transfers (1+2+3+4 - 5 - 6)
1970	517	83	0	87	46	128	513
1980	1,613	180	0	109	1,182	3,234	(2,514)
1988	2,939	576	0	201	2,995	1,318	(557)
1989	3,015	682	199	214	3,348	1,794	(1,032)
1990	4,213	1,093	312	283	3,413	2,192	296
1991	5,217	1,482	0	263	3,770	2,318	873
1992	5,777	1,777	199	298	3,771	2,623	1,576
1993	(1,079)	2,004	2,452	219	4,112	2,577	(3,093)
1994	3,582	2,109	3,672	218	4,174	2,800	2,606
1995	3,529	4,348	4,873	249	4,935	3,000	5,064

Source: The World Bank, 1997, p.276.

There are more signs of vulnerability of financial sector. For example, in 1992, mismanagement of the banking system already had been noticed with the bankruptcies of many small banks and unhealthiness of many "large" banks. A bank crisis was explicitly acknowledged when Bank Duta admitted its losses of $420 million in September 1990, Bank Summa announced its collapse in December 1992 with losses more than $720 million and Bapindo stated that about $650 million of its assets were fraudulent (Hill, 1996, p.37). There were many other banks that admitted their problems. In many cases, the banks'

resources were gambled in the foreign exchange market.

Private Non Guaranteed and Short Term Debts

External debt made by private institutions increases as the country becomes more open to the international market. The era of private debt accumulation in Indonesia started in 1983. The proportion of private debt to total external debt has increased since 1987, noticeably in 1989-90.[1] The proportion elevated from less than 18 percent until 1990 to more than 20 percent afterwards, see Table 2.4. The same table shows the interest payment on long term private debt in 1990 was twice as large as it was in 1988.[2] The private sector's total debt was at least $65 million or 300 percent of the GRI's reserves at the end of 1997 (GATRA, 6/12/97, p.1). Judged by the approximate magnitude of its total debt, the private sector has incurred at least the same amount of debt in fourteen years (1983 - 1997) as the government of Indonesia did in twenty five years (1965 - 1990). Debt crises are likely to occur not only when the debt service ratio is high, above 30 percent of annual exports, but also when the government's foreign reserves are less than that required to back up the debts. The World Bank pointed out that private nonguaranteed debt disbursements jumped from $20.8 billion in 1995 to $39 billion in 1996, with net inflows of $29 billion (World Bank,

[1]Data about private debt are much less available than those of public borrowing. Available data may not represent the real amount / condition because the Indonesian government does not make strong suggestion moreover sanction for those who are not willing to report their debts.

[2]Table 2.4 only shows principal repayment and interest payment on long term debts because data on short term debts was less available. The unavailability was partly caused by the nature of short term debts (World Bank, 1997, p.276).

1997, p.160). According to the World Bank, a substantial part of the loans went to Indonesia (1997, p.160).

TABLE 2.4

PUBLIC AND PRIVATE DEBT 1970 - 1995 (US$ MILLION)

	Debt outstanding		Principal repayment (long term debt)		Interest payment (long term debt)		TDS / XGS	Short term / EDT
Year	Public	Private	Public	Private	Public	Private	Percent	Percent
1970	2,487	461	59	61	25	21	..	..
1980	15,021	3,142	940	693	824	358	..	13.3
1988	41,148	5,545	4,422	818	2,526	429	40.3	12.4
1989	44,262	6,556	4,939	1,056	2,779	570	38.4	13.4
1990	47,982	10,261	4,588	1,224	2,808	605	33.3	15.9
1991	51,891	13,176	4,642	1,899	2,941	829	34.3	18.0
1992	53,666	16,281	5,183	2,598	2,994	777	32.6	20.5
1993	57,132	14,029	5,697	3,447	3,233	879	33.6	20.2
1994	63,891	15,543	5,550	3,405	3,248	926	30.7	17.7
1995	65,347	20,134	5,717	4,483	3,774	1,161	30.9	20.7

Note: TDS = Total debt services; XGS = Exports of goods and services, EDT = Total debt stock
Source : World Bank, 1997, p.276 - 9.

The World Bank also notes that there were significant short term debt increases in 1995 and 1996 (1997, p.160). The increases concentrated in China, Indonesia and Thailand (The World Bank, 1997, p.160). The Indonesian private sector got easier access to offshore loans after 1986 because the GRI paid its debts on time with the help from IFIs and Japan. The offshore loans have short maturity periods and are due in one to five years, eighteen months on average.

Worried as a consequence of such rapid debt accumulation and uncertainty of foreign capital in the future, the GRI established the commercial offshore loan team (Colt) in October 1991. As quoted from the Bank, the Colt was supposed to (1) coordinate all public commercial borrowing, (2) set annual ceilings on external commercial borrowing by public and quasi-public entities and establish guidelines for loan terms, (3) determine the priority order and timing of approved loans and (4) improve reporting and information from public and private entities on external borrowing (The Bank, 1994, p.51). However, the Colt's action had never been heard or seen since then.

Interest payments on short term debt became an increasing part of Indonesia's capital outflow since 1983. It offset part of the oil price positive effects on 1991 balance of payments (The World Bank, 1994, p.41). This effect can be seen from Table 2.5. For example, in 1990 the non oil / gas services deficit was "only" $5,532 million, it became $10,207 million in 1995 and $10,051 million in 1996. More importantly, there are few short-run investment opportunities to enable the private debtors repay their offshore loans.

In 1993, much larger amount of resources were sent abroad than they were received even though the amount of portfolio ($2,452 million) and FDI inflows ($2,004 million) for that year were extraordinarily big. As seen from Table 2.3, the net flows on long term debt was negative (- $3,093 million) because interest on long term debts as well as profit remittance on FDI to be paid for that year were huge ($4,112 million and $2,577 million respectively). One thing can be concluded, the economy has too much external burden already.[3] However, such burden was unseen because the economy had recently became a

[3]As cited in Chapter I, Indonesia's debt indicators were higher than those of Mexico before it experienced another debt crisis. The economy had stable creditworthiness status according to Moody's (Baa3) and Standard & Poor's, BBB for foreign currency debt and A+

middle income country with increasing per capita income. The per capita income was $570 in the reform period and $740 in 1993.

Increased Current Account Deficits

The Indonesian economy has diversified export products (The World Bank, 1997, Vol. I, p.62). Exports of labor intensive manufacturing goods started in 1986 and became greater than resource based exports since 1991 (Pangestu, 1996, p.120). Only 14 years earlier, 60 percent of the outputs and 90 percent of the exports were agricultural products and raw minerals (Pangestu, 1996, p.120). One factor contributed to the achievement of the manufacturing sector was a subsidized export credit scheme. The GRI removed the scheme by April 1991 in accordance to the GATT deadline. The Indonesian economy is very vulnerable to changes in the prices of oil and will still be even when Indonesia is no longer an oil exporting but is an oil importing country in the year 2005-2010 (Ministry of Industry and Trade, 1995, p.18). As seen from Table 2.5, Indonesia still has a surplus merchandise trade balance.[4] However, the merchandise trade balance has always been negative when exports of petroleum and gas are excluded (see Appendix A: Table 4 for the value of exports and imports with and without oil and gas). More importantly, in 1991 and 1995 the economy recorded closer gaps between magnitudes of public debt repayment with the surplus

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for domestic currency, for the period of September 1994 - December 1996 (The World Bank, 1997, Vol. I, p.14).

[4]Total imports is calculated in cif while the exports is in fob. Cif (cost, insurance and freight) includes all the cost involved until the commodity is loaded to the ship/flight plus the insurance and freight costs occurred to bring the commodity to importer's port of entry. Cif - fob = insurance and freight (BPS).

in the trade balances. Table 2.5 also shows that in 1996 the surplus was actually smaller than the payment. The trade surplus in 1996 was also smaller than the difference between factor income from abroad with factor payment to abroad.

TABLE 2.5.

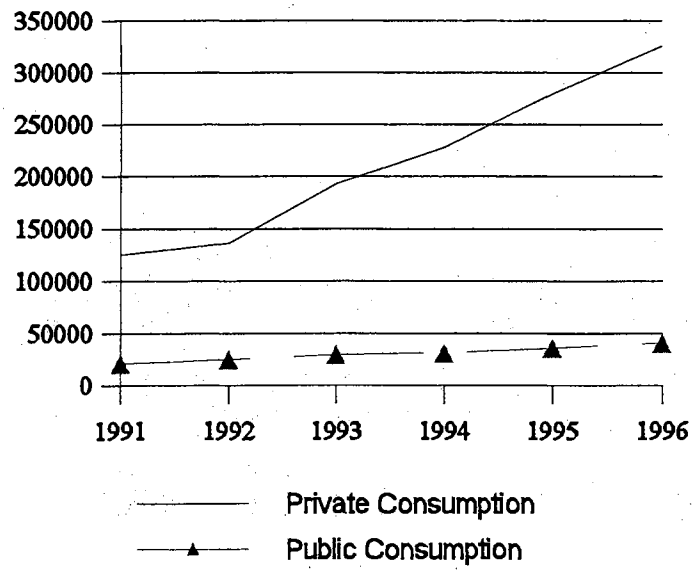
BALANCE OF PAYMENTS OF INDONESIA 1990 - 1996 (US$ MILLION)

	1990	1991	1992	1993	1994	1995	1996
Trade balance	5,352	4,801	7,022	8,231	7,901	6,533	5,285
Non oil / gas services	(5,532)	(6,129)	(6,852)	(7,351)	(7,973)	(10,207)	(10,051)
Net factor income from abroad*	(5,082)	(5,558)	(6,072)	(7,699)	(6,641)	(6,029)	(5,859)
Oil / gas	(3,060)	(3,064)	(3,292)	(3,178)	(2,888)	(3,086)	(3,460)
A. Current account balance	(3,240)	(4,392)	(3,122)	(2,298)	(2,960)	(6,760)	(8,226)
B. Capital and financial accounts	4,746	5,829	6,471	5,962	4,008	10,589	10,502
Public Debt Repayment	(3,201)	(4,219)	(4,708)	(5,262)	(5,390)	(5,449)	(6,066)
A + B	1,506	1,437	3,349	3,664	1,048	3,829	2,276
Errors and omissions	593	(230)	(1,606)	(2,923)	(242)	(2,313)	1,678
Official reserve	(2,099)	(1,207)	(1,743)	(741)	(806)	(1,516)	(3,954)

Note: * from Gross Domestic Product by Type of Expenditures Table (converted to US$).
Source: BPS, Statistical Pocketbook of Indonesia, 1994 and 1996.

The remarkable increases in non oil exports were accompanied by higher rate increases in total imports such that the balance on goods and services were always negative. Deficit in merchandise and service balance was also caused by transportation cost for delivering the imported goods. Imports of almost every category increased during the post reform period. Since 1990, the economy became less flexible than it was before the reform

period because increases in imports for capital goods and accessories as well as raw materials used for production of exporting goods were accompanied by large increase in imports of consumption goods (see Appendix A: Table 5). The growth of total non oil / gas imports for the years were 12.91 percent and 31.59 percent, respectively (see Appendix A: Table 5). Imports of the consumption commodities grew by 23.35 percent during 1993 -1994 and by 94.72 percent from 1994 to 1995 (see Appendix A: Table 5). As shown in Figure 2.1, the private sector increased its consumption significantly during 1991 - 1996. The figure also shows that there were also some increases in public consumption. Increases in private and public consumption happened because of higher restrictions on imports and low consumption levels in the previous periods, but were also largely encouraged by higher debt-supported income per capita.



Source: IMF, 1996, p.537.
Figure 2.1. Private and Public Consumption 1991 - 1996 (Rp Billion)

The current account balance has always been negative since 1965, except in 1974, 1978 to 1980 when oil prices were exceptionally high. Among the main causes are interest payments and salary / wages of foreign workers (non oil / gas services). The deficit was 2.8 percent of the GDP in 1990 and seemed to be going in one direction. The deficit reached 4 percent of the GDP in 1995 ($6.7 billion). In 1996, the deficit was 4.7 percent ($8.2 billion) and was considered unsustainable because it was close to the level when the reform started (5.1 percent in 1986). In 1966 and 1976 the deficits were only 2.4 percent and 2.3 percent of the GDP of their respective years (Little, et al., 1993, pp.412-3). Magnitudes of the deficits are shown in Table 2.5. Deteriorating conditions of the economic fundamentals (current account balance) made the Indonesian economy vulnerable to any sudden changes in global economic condition or any speculative attack directly or indirectly targeted to the economy. It is believed that speculative capital movement tends to be more often or effective to a country with enlarging deficits, especially when the deficit country has an easy to read depreciation cycle and high capital mobility.

Depreciation of the Rupiah

According to Martha de Melo, foreign borrowing can lead to a cyclical swings in the real exchange rate that weaken the signal value of relative prices as incentives indicators for resource allocation (1993, p.102). She continues that the initial effect of foreign borrowing is to cause a real appreciation of the exchange rate relative to what it would other wise be, whereas the subsequent effect of external debt servicing causes a real depreciation. The resulting variations in relative prices imply adjustment costs and can lead to

misallocation of resources with respect to a country's underlying comparative advantage.

The Indonesian economy notices an annual cycle of depreciation of the rupiah and increases of the interest rates that accompany "more likely to fail" monetary policy.[5] Every year the Indonesian economy experiences a rush for dollars to pay for its imports, the interest as well as the principal of its external debts. The rush depreciates the rupiah and creates expectation for further depreciation. About 20 percent of the public debt is in U.S. dollars, while more than 40 percent of the private debts are denominated in Yen and Deutsche Marks, see Figure 2.2. The ratio of debt service to exports went up from 17 percent to 41 percent mainly because of appreciation of Yen against the U.S. dollar during 1985 - 1987. Figure 2.3 shows that at least 19 percent of increases in debts during 1990 - 1995 or $10,282 million out of $53,754 million total change in debt stocks were caused by cross currency valuation. The GRI launched a tight monetary policy to stabilize the price of rupiah and to sustain the current account deficit. The policy was especially tight in 1992 and 1993. As a result, interest rates increased and so was expectation of further depreciation and capital flight (Table 2.5, error and omissions). Because domestic interest rates were much higher than foreign interest rates, external borrowing increased. Parts of the inflows were transferred into rupiahs and deposited to gain interest revenue instead of invested in the real sector. As a consequence, the GRI's tight monetary policy has never been successful.

The Indonesian economy is still very vulnerable to realignment of any major currencies. The GRI and the private sector collect mostly dollars from their exports.

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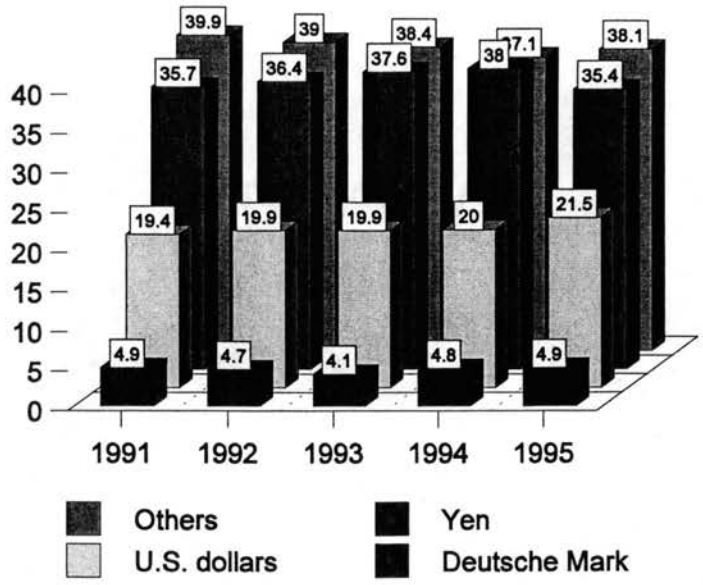
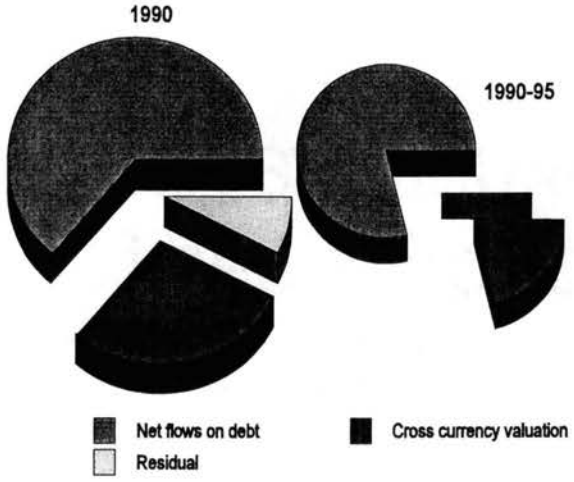
[5]The cycle starts after the GRI gets additional debt from its annual meeting with the CGI (the IMF). The meeting is always announced. Some deregulations are usually announced few months before the meeting, in May, June or July. The President has annual tradition to address the nation, in August, about the government's achievements and plans. Among the achievements is the magnitude of the CGI loan for the year.



Source: The World Bank, 1997, Vol. II, p. 278.
Figure 2.2. Currency Composition of Long Term Debt 1991-1995 (Percent)



Source: The World Bank, 1997, Vol. II, p. 278.
Figure 2.3. Debt Stock Reconciliation 1990 and 1990-1995 (Percent)

However, appreciation of the U.S. dollar against other hard currencies does not necessarily lower the debt since only parts of the debt are invested in exporting sectors or hedged against currency realignment. The appreciation of the dollar certainly increases the total debts and debt services in rupiahs. It also increases the revenue from exports. The depreciation of rupiah, therefore, should carefully be watched because of its impacts on Indonesia's balance of payment.[6]

Budget Deficit

During the 1986-88 reform period the deficits in the current account are accompanied by the fiscal deficits (Ahmed and Chhibber, 1989, p.5). The twin deficits continued in the post reform period because of over investment by the private sectors and continued accumulation of debts by the GRI.[7]

It is a national consensus that external public borrowing should only be a complementary and temporary financing alternative. However, so far, foreign borrowing is the main instrument and is treated as a necessity for financing development. The GRI accumulates larger new debts every year, three to four billion U.S. dollars in the 80s, $4 billion in the first half decade of the 90s and more than $5 billion afterwards. The new loans are made even though the GRI has undisbursed loans, 30 percent of its total outstanding

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[6]The GRI devalued the rupiah in 1976, 1983 and 1986. Since 1988 the GRI implemented "free floating exchange rate system" with some intervention.

[7]Linkages among external trade, investment and debts are summarized as follows: current account balance = budget balance + (private saving - private investment). The relationship is a national accounting identity. Based on the identity, a current account deficit is associated either with budget deficit or over investment by private sector or both.

debts. Net official capital in 1996 was negative and in absolute term the magnitude was larger than that for 1995 or 1994 (Table 2.1). Data about the debts and its payment are incomplete and confusing. For example, the magnitudes of 1990 - 1992 debt repayment on the principles on public loans, shown in Table 2.5, are smaller than those shown in Appendix A: Table A.3. There are more unanswered questions regarding the use of the loans, as told by Hill, "no accurate and detailed compilation of the external debt holdings has ever been released" (1994, p.73).

Table 2.6 presents budget surpluses / deficits as published in the International Financial Statistics by the IMF and as understood from the GRI practices together with the GRI's primary surpluses from 1990 to 1995 (Appendix A: Table 6 provides details).

TABLE 2.6.

PRIMARY SURPLUS AND BUDGET SURPLUS / DEFICITS
1990 - 1995 (US$ MILLION)

		1990	1991	1992	1993	1994	1995
1	Budget surplus *	344.63	(386.55)	696.29	114.98	2,939.50	(1,545.00)
2	Primary surplus	2,902.00	2,308.52	2,868.09	2,160.19	3,386.40	3,843.15
3	Budget deficit ()	(3,988.90)	(5,306.99)	(4,511.64)	(5,973.93)	(4,987.27)	(4,677.21)

Note: * IMF, 1996, p.356.

By the GRI's accounting practices the deficits are investment expenditures that are not covered by public saving, but by borrowing. The deficits increased noticeably since 1990, they became twice larger than the primary surplus in 1991 and 1993. It is therefore very

obvious in the Indonesian case that reducing the budget deficit, as suggested from row 3-Table 2.6, would reduce the current account deficit.

The Relationship between the GRI and Its Main Creditor

The relationship between the GRI and its main creditor, the Inter Governmental Group on Indonesia (IGGI) is rather obvious.[8] Most of the official debts are owed to this group. Table 2.7. shows magnitudes of the loans that come from the group and how small a portion of the loans that come from other creditors. Every year the GRI submits proposals for projects to the group in order to receive funding. Annual loans from the group accounted for around 60 percent of the projected development budget expenditures for the first Five Year Plan (Repelita), 1969-1974 (Robinson, 1986, p.138). As shown in Table 2.7, this percentage did not get lower until 1990.

There are three components of the group loans, "untied" concessionairy loans, project loans and program loans.[9] The first one is a soft loan, with interest rates lower and grace period longer than that of commercial loans. It can be used for supporting the official

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[8]The IGGI was formed in 1967 as a consortium of fourteen members headed by the United States, Japan, the International Monetary Fund (the Fund) and the World Bank (the Bank). Until 1993, the official leader of the group was the Netherlands. The IGGI was substituted by the Consultative Group for Indonesia (CGI) in 1993. Further insights are available in Hill 1994, Schwartz 1995, Vatikiotis 1994.

[9]After 1983, the fact that 25 percent of the GRI's debts were concessionairy loans did not mean it got a better deal compared to other countries who borrowed from mostly the same creditors under no specific group. It can be seen in Appendix A: Table 7, that the interest rate on all long term debt was 16.6 percent for Indonesia. It was higher than that on Mexico's (16.1 percent) and Brazil's (11.2 percent), even though the earlier interest rates for Indonesia was lower and the other two countries had higher proportion of loans with variable rates.

reserves, while the other two can not. The project loans are 70 percent or more of the total loans, most of it for investment in the infrastructure. Through the project loans, the group exports merchandise and services for the GRI's projects. When the economy becomes less flexible and more vulnerable to external shock, it needs more flexible loans and fast disbursing accounts.

The loans from the group played an important role in helping the economy to grow as well as to establish "structural" deficits, dependence on more loans and foreign capital for its creditworthiness. On one hand, the access to the loans, especially to concessionairy loans, may provide a temptation to the GRI to bring as many proposals as it can for getting "has to be spent money." The GRI does not feel necessary to inform its people about the usage of the loans as long as it can get another loan from the groups. Indonesia is not the only country in the whole world that consults with the IMF every single year. It seems that the GRI is not the only country that assumes the credibility of the economy depends on its government ability to get more loans no matter what "prices" it has to take. The GRI presumes to tell people that the group gives the loan because the previous usage of the loans was considered proper. On the other hand, the creditors give the loan as long as they considered it is a good business for them. Like many other developing countries, it is very hard for the GRI to get bilateral loans. This is especially true with the existence of the group. The potential creditors prefer to use the group so that they have more bargaining power to exercise their conditionality than if they give the loans bilaterally.

Last but the most important in relation to the future reform strategy, the IMF "leadership" in the meeting may make international fund managers and capital owners think

the meeting is a forum for giving "involuntary lending" to the economy.[10] Therefore, the annual consultation with the IMF could be another factor that made investors delay their investment until Indonesia resolves its "adjustment, " that is when the economy does not need the "involuntary" lending anymore. Most of the time, the CGI / IMF praised the GRI's efforts, but such closeness with the CGI / IMF did not seem to help Indonesia gain enough international confidence for attracting foreign direct investors.

Debt Services

One of the reason why private investors shy away from long term "irreversible" investment (foreign direct investment) is they are concerned over viability of policy reforms in the country. According to Chhibber and Dailami: "high debt service ratios are a signal to both domestic and foreign investors of the likelihood of policy reversals" (1993, p.144). Debt service payment represents a heavy burden on Indonesia's public finance and balance of payments. The GRI began to pay interest on its long term debts after the grace period was over in 1982. From 1980 to 1989, the economy actually had been experiencing negative net capital transfers - additional capital inflows are less than the total payment for foreign capital / workers and amortization of the previous debts, see Table 2.3. The phenomenon happened again in 1993. The ratio of debt service payments to government routine expenditure rose from about 12 percent in 1983 / 84 to 27 percent in 1985 / 86 and more than 40 percent ever since (see Table 2.7, column 2).

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[10]The IMF orchestrated involuntary lending during 1980s and lessen free-rider opportunity among creditors when they faced a possibility of giving debt rescheduling or forgiveness for certain debtors (Cline 1995).

TABLE 2.7

COMPARISONS OF PUBLIC DEBT SERVICES, GOVERNMENT EXPENDITURES AND IGGI LOANS (US$ MILLION)

1 Year	2 Public debt services --------- (2/6)	3 IGGI loan --------- (3/5)	4 Non IGGI loan ------- (4/5)	5 Development expenditures	6 Routine expenditures #
1985	2,973 (27.63)	...	...	9,787	10,758
1986	42,931 (40.62)	...	...	6,494	10,568
1987	4,967 (46.71)	4,205 (73.17)	685 (.07)	5,746	10,634
1988	6,443 (52.38)	4,930 (67.84)	582 (.05)	7,266	12,301
1989	6,661 (48.47)	5,137 (65.72)	1382 (.1)	7,816	13,746
1990	7,133 (43.82)	4,507 (42.70)	29 (.001)	10,555	16,277
1991	6,760 (43.61)	5,227 (46.83)	411 (1.88)	11,161	15,501
1992	7,360 (43.91)	5,574 (46.88)	246 (.01)	11,889	16,764
1993	7,496 (41.02)	5,786 (49.31)	219 (.87)	12,427	19,095
1994	5,390+	5,353 (40.38)	344 (2.6)	13,256	19,627
1995	5,449+	5,627 (43.56)	158 (1.22)	12,917	22,765
1996	6,066+	4998	628	n.a	n.a

Note:
IGGI = Intergovernmental group for Indonesia. Ratios are in percent.; n.a = not available
# include debt service payments + interest payment not included
Source: The World Bank (1994): Tables 4.1, 5.1 and BPS (b).

With its debt accumulation, sterilization effort is a must but expensive policy for the GRI.[11] Sterilization is a must because with the economy's previous debt accumulation and increased dependence on imported raw materials, consumption goods and capital inputs, it is possible that a large appreciation of the rupiah may decrease export revenues while a large depreciation may cause high increases in its debt obligation because substitution for imported materials and capital is limited. Sterilizing domestic currency is also a must because a large depreciation may be considered as shocking news, as in the case of Mexico. The country may experience a sudden and huge amount of foreign capital outflows as there are more investment opportunities for players in global financial market. Instead of spending time and resources to investigate the real situation in a country, most players would transfer their assets out of a country either when they hear shocking news about a situation in the country or when they see bigger players move their assets out (Calvo and Mendoza, 1996, p.245). A large depreciation may be helpful only if the potential growth of the exports market is unlimited (which only exists theoretically, for a small country).

The political situation of preparing for 1997 election will contribute to higher inflexibility for reducing government expenditures and for more uncertainty regarding future course of capital flows. There had been riot in July 1996 and popular discontent was more

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[11]There are two types of government intervention, sterilized and non sterilized interventions. The sterilized intervention (sterilization) is a way to offset / sterilize the impact of foreign exchange market intervention in the money supply through open market operations (Dornbusch, 1983, p.613). The foreign exchange loss reduces the money supply, the money supply is restored by the central bank's purchases of domestic assets (limited by the magnitude of official reserves). The bank can increase its sterilization ability when it increase the reserve by borrowing from the IMF / other countries, or it can persuade other countries to accumulate the currency that is in excess supply (Dernburg, 1989, p.113). "Sterilization works best when domestic and foreign bonds are poor substitutes, implying a highly interest-sensitive demand for money" (Dernburg, 1989, p.355). The cost of doing sterilization is higher when the economy is bigger or speculative attacks are stronger.

explicit than it ever been (see Eklof 1997 for information).

Conclusions and Policy Implications

As of 1996, the economy was in a very fragile condition and another debt crisis might strike whenever there is an external shock before the GRI implement a serious attempt to fix the economy's sources of vulnerability. High dependence on the coming of foreign capital and heavy obligation to service external debts were sources of the economy's financial vulnerability. The economy had every condition that Mexico had before it experienced 1995 debt crisis. Those were enlarging current account deficits, high dependence on portfolio flows, a weak financial sector, and an election.

The growing current account deficit was not likely a short term problem that could be helped by just taking larger loans.[12] It was a structural debt servicing problem because (a) increases in export revenue did not catch up with the increase in debt obligations; (b) more liberal investment and trade policies made it less possible to direct private new investment as well as additional imports into infrastructure and exporting sectors; and (c) there was continued high dependence on additional loans for servicing debts and preventing the depletion of reserves.

Since Indonesia has very high capital mobility, it is possible that expectation of a larger devaluation of the rupiah may lead to high, possibly massive capital outflows where an attempt to sustain the exchange rate will deplete its reserves and create a balance of

[12]Ramli reached the same conclusions when he summarized the economic condition for 1990 (1991, p.10). His way of explaining why the growing account deficit is a structural debt servicing problem is presented here.

payment crisis. The matter is serious because while its borrowing capacity is more limited than before, the GRI needs larger and larger official reserves to prevent the crisis.

There are at least three policy implications that should be given much attention by the GRI. First, there should be a serious attempt to fix the economy's sources of vulnerability. Second, the GRI should design development and crisis rescue plans that do not increase its future debt burden. If there is another debt crisis in Indonesia in the future, it would require a different solution than the other previous crises. The solution should be different because the economy is more open than before and debts are owed not only by the public but largely owed also by the private sector. Third, the GRI should carefully consider how a policy will affect the private sector ability to fulfill their debt obligation before it implements any policy. Those three policies are equally important and complement to each other.

CHAPTER III

THEORETICAL BACKGROUND OF STABILIZATION AND REFORM POLICY: STANDARD AND STRATEGIC REFORM POLICIES

The main purpose of this chapter is to present the derivation of the strategic reform policy for the Indonesian economy. The strategic policy is a modification of the IMF stabilization policy. The modification is needed to avoid certain effects of the standard IMF policy package. There are three parts of this chapter. Part one is theoretical background, assumptions and contradictions underlying the standard policy. The second part focuses on the strategic reform policy. The third part is a summary of the previous parts. It provides short comparisons and examples of the standard and the strategic policies.

Part one is disseminated into five sections. Section one explains the theoretical background of the IMF policies and some policies that are traditionally included in the standard stabilization package of the IMF. This section is mostly taken from Cline (1983). Section two provides arguments from Cline, Anne Krueger and other prominent supporters of the policies regarding certain "inherent" contradictions among the components of the standard policy. Section three presents underlying assumptions of the policy to see the relevancy of using the standard policy in the Indonesian economy. Section four concerns credibility of the policy and section five illustrates experiences of some other countries that are considered relevant for designing stabilization policy for the Indonesian economy.

Part two's contents are main components of the strategic reform policy. They are

presented with supporting arguments from Dornbusch (1983), Dernburg (1989), Vito Tanzi (Fani and de Melo, 1993) and some other known scholars.

Standard Policy

When a country has a short run current account / fiscal deficit or debt servicing problem, the government of an International Monetary Fund (IMF) member country can use a stand-by arrangement or other facilities of the IMF together with structural or sectoral loans from the World Bank. When a member uses the IMF facilities it may purchase a certain amount of U.S. dollars on related market terms with its own domestic currency (Schadler, 1995, p.3).[1] The U.S. dollar is the only hard currency usable after the Mexico crisis in 1995-1996. These resources are "tied loans," because they are "reserved" by the IMF only for a country who agrees to implement certain stabilization and reform policies. The IMF gives only a small amount of the loan after the country signs an agreement and delivers the rest of the loan by fractions after the debtor takes certain steps of the adjustment program. In addition, the Bank will not deliver its program loans without IMF approval. The objectives of the IMF policy package are to improve the balance of payments and to insure the resumption and / or maintenance of full external debt service (Rivera-Batiz, 1994, p.308). In this study, the IMF policies are referred to as "standard" policies. The stand-by arrangement and extended fund facility are among the resources available for middle income countries (see Appendix B: Table 1 for the types of the resources). The IMF

[1]The maximum amount of resources available after the crisis is SDR (special drawing rights) 34 billion or about $48 billion (The World Bank, 1997, p.17).

stand-by agreements are secret and the statements regarding their content are limited to generalities (Mikesell, 1983, p.53).[2]

Theoretical Background of the IMF Stabilization Policies

The effects of the conditionality that the IMF imposes on the economic policies of different countries are usually measured on the basis of the IMF's model (Lichtensztejn, 1983, p.210).[3]

The basic monetary model of the balance of payments has influenced IMF stabilization programs for years. Typically these programs contain clauses specifying limits for expansion of domestic credit (Cline, 1983, p.176). Orthodox stabilization theory focuses on excessive money creation and overvaluation of the exchange rate as the sources of inflation and balance of payments (BOP) deficits (Cline, 1983, p.175). The principal orthodox policy measures for achieving economic stabilization are a reduction in the rate of growth of domestic credit and devaluation of the exchange rate. The measures are formulated by J. Polak and known as the monetary approach to the balance of payments (MABP). In the Polak model, income equals money supply times velocity (by the quantity theory) and the money supply equals domestic credit plus international reserves.[4] In equilibrium, this year's income equals last year's. The standard policy suggests zero

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[2]Diaz-Alejandro criticizes IMF secrecy and pleads that at least documents older than 10 years be open to scholarly examination (Cline, 1983, p.205).

[3]The IFIs' conditionality is "the policies the IMF expects a member to follow in order to be able to use the Fund's general resources (Lichtensztejn, 1983, p.209).

[4]The quantity theory: $HV = PT$, where H = money supply, V = velocity, P = price level, and T = transaction or real activity.

economic growth when there is a crisis. Therefore, this year's money supply must equal last year's. Any growth in domestic credit must, therefore, be offset by reduction in reserves to hold money supply constant. Reduction in reserves means a BOP deficit. Essentially, any expansion of domestic credit leaks abroad through a BOP deficit and reserve loss. Accordingly, a BOP deficit must be corrected by reducing domestic credit. The model transposes to a growth basis as follows: if domestic credit is growing too fast for consistency with real output growth (and velocity trend), reserve losses will result and stabilization can be attained by a reduction in the growth rate (rather than the absolute level) of domestic credit. BOP deficit is measured either by the overall deficit in autonomous transactions (current account plus capital / financial account) or credit in the accommodating transactions (Alawode, 1993, p.13).

A more general version of the orthodox model of stabilization is designed to reduce inflation and a BOP (current account) deficit. The stabilization policies emphasize demand management by controlling inflation and the real exchange rate to correct short-term departures from equilibrium; usually departures precipitated by internal imbalances such as temporary loss of budgetary control. Fiscal stabilization policies are central to this effort (Edwards, 1989, p.255). The model involves a package of three instruments: exchange rate, money supply growth, and public budget deficit (Cline, 1983, p.176). In the orthodox model, the fiscal deficit is reduced following the absorption approach. The trade deficit (exports minus imports) equals the investment-saving gap (I - S) plus the fiscal deficit (government spending - taxes). To the extent that the trade deficit corresponds to an investment-saving gap, there is no particular problem if foreign capital can be mobilized. But if the origin of the trade deficit is in excess government spending, domestic absorption

exceeds domestic output for reasons of excess current consumption, not capital formation, and the situation is remedied by reducing government spending or by raising taxes. The exchange rate component of the package is designed to address the trade deficit. Devaluation of the exchange rate should increase exports (as domestic producers receive more domestic currency per unit exported) and reduce imports (as consumers must pay higher prices for imports in domestic currency). The three traditional elements of the policy package are complementary. Any recessionary impact of reduced fiscal deficits, and of reduction in activity rather than price in response to monetary deceleration tends to be offset by the stimulative effect of devaluation's impact on the trade balance. That is, in the national accounts the drag of imports is reduced, and the contribution of exports is increased under the orthodox response of trade to devaluation.

In recent years, the standard IMF approach embraces the need for special developmental measures in achieving structural adjustment by lengthening of IMF lending maturities (extended fund facility) and cooperating with the World Bank. They are sometimes referred to as the new orthodoxy. Over the years the IMF also included other measures to channel capital in and out of the countries easily, financial and investment sector liberalization.

Reform or structural adjustment policies are deregulations to bring trade and financial liberalization.[5] Interest, taxes and sometimes foreign exchange or reserve requirements are used as the instruments. These are microeconomic programs designed to have positive supply effects. Reformation policies deal with coordination, pace and sequence. Coordination refers to other policy instruments which must be changed in order to maintain

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[5]This section is mostly taken from Collier and Gunning, 1990, p.224.

policy compatibility: that is, sustainable balance of payments and fiscal positions. Pace refers to the speed of policy change. At one extreme, all remaining trade restrictions can be removed at once. For any slower pace the issue of sequence will arise: the choices as to which tariffs should be reduced first and whether quotas should be relaxed ahead of tariff reductions. A major new study on trade liberalization by Papageorgiou, Choksi and Michaely (1990), primarily in LDCs appears to be somewhat dismissive of the coordination problem (Collier and Gunning, 1990, p.224). It is generally believed that macroeconomic stabilization is required before any reform and that structural or real sector reform should be undertaken prior to financial reforms and those reforms are intended to encourage saving and investment (Pangestu, 1996, p.34). In Indonesia, financial sector liberalization had proceeded real sector reform and in a reverse sequence and at a faster speed than recommended by the World Bank in the 1989 World Development Report (Pangestu, 1996, p.34). Some economists believe the credibility and sustainability of reforms is more important than the timing and sequencing of the reforms (Pangestu, 1996, p.35).

With its stabilization and reform program the IMF tries to make sure that increases in government revenue are higher than increases in interest payment on the debts by ordering the authorities to unilaterally reduce domestic public expenditures and increase local interest rates through slower domestic credit creation. The following are the "standard" policies: (1) contractionary monetary policy: contraction of domestic credit creation; (2) contractionary fiscal policy: increase tax revenues, cut government spending: cut subsidies, sell unprofitable government enterprises and privatize state enterprises in general; (3) devaluation of debtor country's currency; (4) liberalization of trade: abandon any import restrictions as well as export subsidies, adjust relative price: cut any non market

price mechanism; (5) liberalization of investment and financial. Those policies are "standard" because they are the typical policies suggested by the IMF to many deficit problem developing countries. In the 1980s Latin American indebted countries suffered hyperinflation and were desperate to maintain service on their debts. The economies had been forced to adopt austerity policies which have resulted in nearly a decade of slow growth.

Inherent Contradiction within Policies / Objectives of the Standard IMF Package

There are at least five contradictions within the standard policies. These are:

1. Reducing inflation and reducing imports through devaluation

The standard package was designed primarily to attack inflation but Cline and Krueger are well aware that the effects of devaluation are likely to be inflationary because devaluation raises the relative prices of tradables, especially when supply and demand elasticities are low in the sector of nontraded goods and services. Considering anti-inflationary measures per se, Anne Krueger maintains that, outside of a few exceptional cases, there typically has been some recessionary cost of reducing inflation. However, "if external finance can be arranged, increased imports can help reduce inflation while reducing the trade bias at the same time" (Cline, 1983, p.187). This dependence on increased imports for reducing inflation is contradictory to the expected orthodox trade response to devaluation, mentioned earlier by Cline, that is decreased imports. Also, it is important to note that, as pointed out by Krueger, the package suggests further dependence on foreign capital to support the economy after the adjustment period. It is possible that higher dependence will lead to higher vulnerability to external shocks which might pursue the same

problem with the one that triggers the debt crisis in the first place. In Mexico case, the vulnerability and the problem are always getting bigger. The scale of the problem is shown partially by the magnitude of the new loans (bail out money) needed.

2. Eliminating trade bias and encouraging growth

Slower growth is likely to accompany stabilization because of fiscal restraint and because correcting trade bias alters resource allocation (private agents tend to delay their investment). Output will fall in the sectors formerly favored by the bias while it may take some time for investment and activity to respond in the newly favored sectors, especially if economic agents do not consider the government's program to be credible. Krueger holds that such growth losses are usually much smaller than the longer-run growth gains achieved by eliminating trade bias (note: if external financial arrangement exists).

Cline recorded that the stabilization-growth trade off became more complicated in the 1970s because of the need for long run adjustment to a changed external environment (the oil shock and slower growth in industrial country markets) as opposed to simple correction of internal dis-equilibria.

3. Stabilization and possible worsening of income distribution

Stabilization affects income distribution through its impact on real wages, employment level, and entitlements for the poor. Cline argues that even though adverse distributional consequences of stabilization may occur in practice, the standard theory does not provide an automatic justification for the extent of real wage reductions that have often been observed in some of the more politically conservative stabilization efforts (1983,

p.192).[6] Cline acknowledges that reduction in government spending hits social programs such as health, housing and social security, but he is certain that the reduction does not necessarily worsen the distribution of income. To support his view, he presented the case of Peru. According to him high food prices may have helped low-income farmers and reduction of gasoline subsidies was almost certainly borne by those in the upper portion of income distribution (Cline, 1983, p.192).

4. Correcting balance of payments deficits and making less sustainable deficits

This section is taken from Alawode (1997). Correcting the BOP deficit principally via monetary restraint is likely to be welfare reducing. BOP adjustment pursued via the compression of aggregate demand and recession cannot endure. A sustainable BOP position is impossible because a recession may constrain the production of exportables and make it more difficult to earn foreign exchange and service external debts. A sustained fall in outputs may even serve to reduce the demand for money making it difficult to restore the money market balance. If deficit countries continuously transfer capital to surplus countries, there is no amount of monetary restraint that can restore BOP balance. A consistent and effective attack on BOP problems, therefore, requires sustained external financing and a reduction in debt-service obligations in order to lay the foundation for sustainable BOP positions. BOP adjustment in deficit countries will be difficult if the burden of adjustment remains asymmetric with surplus countries unwilling to play their part in the adjustment process. Efforts to correct BOP deficits should look beyond monetary factors and consider

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[6]Cline argues that it is theoretically possible to achieve external stabilization through devaluation without reducing real wages. Therefore, it should be possible to achieve stabilization without reduction of real wages by the full extent of devaluation. In other words, draconian reduction in real wages are not necessarily required for external stabilization (Cline, 1983, pp.192-95).

tackling external debt problems and ensuring resource flows into deficit countries.

5. Taking loans for adjustment and ensuring credibility of the adjustment

This section is taken from Collier and Gunning (1994) and is portrayed in Figure 3.1. A fundamental problem with taking the loan strategy is that it is likely to induce destabilizing speculation on the part of private agents within the economy. This uncertainty arises largely because of the aid. Private agents cannot tell whether the government is genuinely committed to liberalization, has already decided to take the aid donors for a ride, or has simply welcomed the money and deferred the agony of decision. A unilateral decision, whether supported by donor agencies or not, is liable to be time inconsistent.[7] According to Mosley, if the government consider liberalization + aid are better than protection, and that protection is better than liberalization without aid, then temporary aid is liable to produce only temporary liberalization (Collier and Gunning 1994, p.224). Although this uncertainty is not important for the choice of whether to accumulate inventories of imports, it is extremely important for the choice of where to install fixed investment. As depicted in Figure 3.1, if the liberalization is maintained then the best strategy will be to invest in the export sector which will benefit from the exchange rate depreciation. The figure also shows that if instead the government aborts the liberalization, then the import-substitute sector will revert to being profitable. According to Dixit (1989), since once capital is installed it is at best costly to shift it between sectors, the uncertainty as to policy creates a premium on keeping options open by delaying investment and acquiring financial assets (Collier and

[7]This inconsistency existed in the Indonesian economy. One lesson from dealing with the IMF is that deregulation and liberalization are needed to get new loans. Therefore, from the debtor point of view, such as the GRI until 1996, the economy should have some sectors that need deregulation / liberalization as part of a bargain to enable its government get more loans.

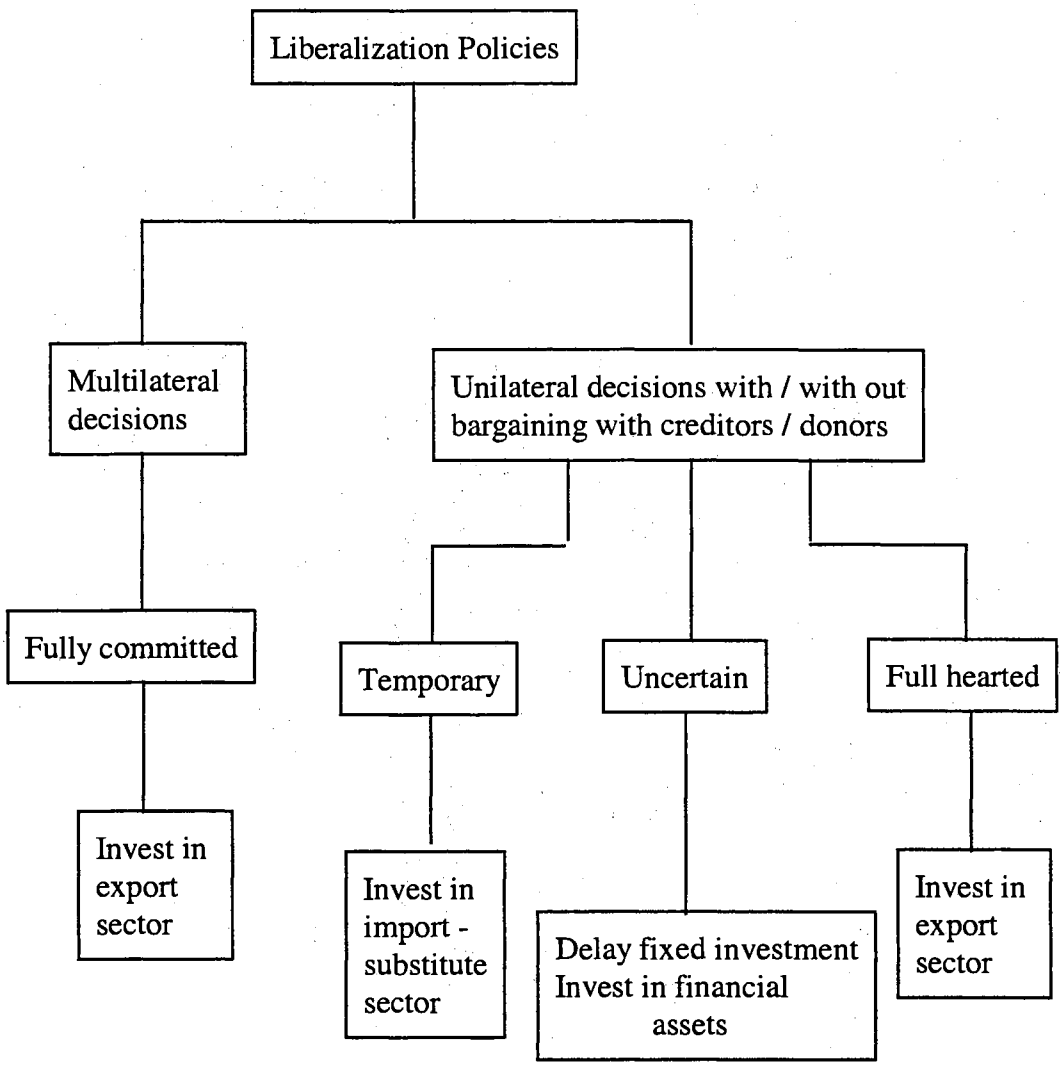

Figure 3.1. Private Agents' Perceptions and Investment Decisions

Gunning 1994, p.226). These two private responses reinforce each other. If investment is deferred, the gains in real income from resource reallocation take longer to come through and so the post-aid exchange rate depreciation must be larger if it is to maintain policy compatibility. This, in turn, makes it less likely that the government will choose rather than abort liberalization. Further, if investment is deferred, it becomes typically easy to finance the accumulation of inventories of imports. Such inventories become the option-preserving asset which dominates.

Underlying Assumptions of the Standard Policy

The International Financial Institutions (IFIs), the World Bank and the IMF, policies are based on the following assumptions: (1) the country has an unacceptably high rate of inflation, (2) it is losing foreign exchange reserves, and (3) it has an unsustainable current account deficit. Conditions (2) and (3) will be represented in the computable general equilibrium model for this study. Based on the first assumption, the first and primary step in almost all stabilization programs is to reduce the primary (non interest) budget deficit. Implicitly, it is assumed that the inflation was caused by monetization of financing excessive budget deficit. Any country that takes the IMF loans will be viewed as having excessive aggregate demand and hyperinflation. Such an image is not helpful for credibility of the GRI. Inflation rate in the Indonesian economy was not unacceptably high compared to the inflation rates in the other indebted countries helped by the IMF (more than 100 percent). On average the rate was less than 12 percent during the last ten years, see Appendix A: Table 2. If the inflation happens during the crisis, it is likely be caused by higher production

costs because of import prices. Therefore, considering the special way of the GRI in measuring Indonesian inflation rates (see Chapter I) and the acceptable rate of inflation Indonesia has before the crisis starts, the traditional primary step is not appropriate.[8] As part of its prudent macroeconomic policies, the GRI usually sets its investment expenditures as a residual of its revenues minus its consumption expenditures (GRE) and only as they can be covered by loans from the CGI. Forty percent or more of the GRE is budgeted for the debt amortization and interest payment. See Appendix A: Table 6 for an example of the GRI's actual and budgeted revenues and expenditures.

The IFIs assume a stabilization policy can go together with a reform policy. They emphasize simultaneous application of the two policies. However, some economists, such as J. Sachs, believe that it is almost impossible to launch stabilization and liberalization on the same time. Sachs wonders why the country must be compelled to undertake the policy if the actions being recommended by the IFIs are really "desirable" for the country?" (1989, p.277). For instance, if producer prices and / or subsidies are still permitted, developing countries would be able to stimulate exports and less dependent to external debt with its related problems. McKinnon also states that "the IMF and World Bank should not bribe developing countries into trade and financial liberalization, since bribes taking the form of capital inflows are themselves harmful to the liberalization effort"(Fry, 1995, p.301). Fry and some other economists argue that financial liberalization stimulates investment more than it stimulates saving. Therefore, the liberalization has been associated with excessive foreign capital inflows that decrease the exchange rate (domestic currency appreciates),

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[8]See Widodo (1990, pp.43 - 47) for information regarding the calculation of the consumer price index and the inflation rate.

depress exports and imperil monetary control. To prove whether such condition happens in Indonesia is beyond the objective of this study.

Credibility of the Standard Policy

According to Rivera-Batiz, the evidence about the IMF success is ambiguous and the "IMF sponsored reforms often did not help in reestablishing confidence and interest rate stability because their short-term focus prevented investors from believing that government policies would not be reversed in the near future" (1994, p.313). See Appendix B: Table 2 for the IMF's success records in sponsoring its policy package.[9]

According to Dernburg, the standard policy has a shock treatment nature, such that if the government follows the advice to accompany devaluation with absorption reducing policy, the economy may have nasty recession with heavy unemployment (1989, p.255). In return, the IMF may succeed in getting the country out of its chronic payment deficit even though its austerity programs is inconsistent with employment and growth objectives of the developing country (Dernburg, 1989, p.255).

Experiences of Other Countries

The following examples are a destabilizing error from Peru case 1978 - 79 (mostly

[9]Indonesia was considered as one of the success stories of the IMF. According to Payer, the success was that of the multinational corporations and of Japan. For example, through the IMF Japan secured "the assurance that Indonesia will continue to export its petroleum and timber to serve the needs of the Japanese economy rather than its own" (1974, p.91).

taken from Dell 1983) and a creative stabilization and reform policies implemented by the government of Malaysia (Chanders, Robless and Teh, 1981). The experiences of the two countries are relevant for this study for two reasons. (1) Indonesia has diversified exports but is susceptible to a volatility of the price of one of its commodity (oil / gas). (2) Indonesia has the need to insulate the poor from external shocks and to avoid another social clash between native Indonesians with Indonesian Chinese (Schwarz, 1994, pp.98 - 132; Hill, 1994, pp.32 - 4; Hill, 1996, pp.109 - 10).

In the Peruvian case, the source of imbalance was a temporary and reversible factor- the low price of copper. The cost to Peru in lost output and investment was out of all proportion to the magnitude of the external problem that had been encountered. Peru was compelled to negotiate for an IMF stand-by arrangement in the third quarter of 1978 and had to accept stringent obligations to deflate the economy-less severely than the unrealistic agreement of December 1977 had provided. Yet if one examines the balance of payments projections agreed upon as a basis for the stand-by negotiations, it is immediately apparent that, had the negotiators known that the price of copper would recover from $0.58 a pound in July 1978 to $0.90 a pound in March 1979, they would have realized that that fact alone would come close to restoring external balance without any cutting down of the economy at all. By April 1979, the Peruvian BOP was so strong and the inflow of capital so massive that the international press was reporting the country's inflation-inducing surplus of dollars.

In the Malaysian case, "its government pursued a whole battery of measures designed to help insulate the poor from external shocks" (Cline, 1981, p. 235). The country had barely emerged from the 1969 outburst of major racial conflict when it was shaken by 1972 - 1975 world cycle of inflation and recession. The government response was to moderate the

pace of inflation and alleviate its impacts in order to eradicate poverty among all Malaysians and to restructure Malaysian society so that identification of race with economic function would be reduced and eventually eliminated. Such strategy required a rapid pace of economic growth to prevent any group from experiencing any loss or sense of deprivation in the process. The government's dilemma was to control inflation without upsetting its program to help the poor. Because of such dilemma the policies and measures adopted by the government followed a middle course. They came to be designed more as a series of measured response to the situation as evolved, rather than a set of preemptive strikes, so as to avoid over reaction. They are aimed at moderating the impact on aggregate demand of export earning fluctuations through monetary and fiscal action; expanding the availability and reducing the cost of key supplies of domestically produced and imported goods; controlling the prices of basic consumption and investment goods and alleviating the impacts of inflation on the poor (Chanders, Robless, and Teh, 1981, p.219). In addition the Bank increased its maximum borrowing and minimum lending rates and raised interest rates on fixed and saving deposits to introduce a modicum of restraint on credit expansion and to encourage saving.

There are two important notes from the Peruvian case (Dell, 1983, p.43). First, it is alarming that such a country can find itself compelled to endure lasting damage to its economy because of circumstances that are reversible and because of inability to mobilize BOP support on a scale sufficient to avoid such damage. Second, it is disquieting that the economy of a country such as Peru-which among developing countries has relatively diversified exports-can still be at the mercy of the volatility of a single commodity. An important lesson from the Malaysian experience is that "adjustment to external shock can be

carried out in a way that minimizes adverse impacts on the poor" (Cline, 1981, p.235)

Strategic Reform Policies

Even though they have standard adjustment programs, the IFIs acknowledge that each country should be considered as having unique pre adjustment conditions which deserve different policies. They also emphasize the advantage of the government's involvement in designing the program from the beginning as well as willingness to solve the program as needed. Before the signing of the conditionality, the IMF sends a team to discuss the necessary solution for the country.[10] Therefore, when the GRI faces another external shock, it can choose to implement its own unique programs without having to be worried of being viewed as challenging the IMF. Moreover, the Bank states that "conditionality is unnecessary when the borrowers deliver all reforms up front"(Jayarajah and Branson, 1995, p.258). Another economist, Vito Tanzi, who was also an official of the Fund, stated that the Fund should be ready to relax its fiscal conditionality and require less fiscal adjustment, provided that efficient, growth enhancing measures were being concurrently introduced (Fani and de Melo, 1993, p.12).

An alternative adjustment and reform policy would require correct identification of the sources of inflation and mobilization of social consensus. The identification and the mobilization are needed to slow down and ultimately halt the struggle between social groups

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[10]However, because the crisis may has just developed, it is possible that the "panic" debtor country is not ready to discuss more unique / appropriate programs at the negotiation time. It is more concerned with the magnitude of the loans from the IFIs compared to that from other possible sources.

to safeguard / change their respective shares of real income. It is a policy which does not involve very large reduction in real income, or no reduction at all. Lessons learned from the past adjustment policies by other highly indebted countries imply the need to counter the slow down of the growth rate which is caused by the fall in investment, deficient demand, and negative effects on productivity created by distortionary trade policies.[11] The fall in investment can be caused by terms of trade deterioration, high interest rates, cutbacks in public investment, and disincentive effects of debt overhang besides the sharply reduced external financing flows.

Components of the Strategic Reform Policy

The following sections discuss six components of the strategic policy. The main components of the policy are: (1) social consensus, (2) multilateral adjustment, (3) promotion of exports, (4) counter cyclical fiscal policy, (5) expansionary monetary policy, and (6) debt reduction. Multilateral adjustment is practiced when the burden of adjustment is distributed equitably and efficiently among countries. The components are considered suitable for a developing country (Indonesia) which has acceptable inflation but has to deal with twin deficits and unemployment problems. The country has abundant natural resources but their extraction depends largely on the initiatives and capital from abroad.

[11]See Fisher (1988) for the post reform conditions of the highly indebted countries. For the Indonesian economy "the need to affect adjustment without a cut in investment is a key adjustment challenge for the 1990s"(Chhibber, 1989, p.10).

Social Consensus

There are three reasons why getting a social consensus before implementing austerity measures is important. First, it is most likely that any austerity measures are not popular domestically. Implementing the austerity policy is more difficult when the government is politically no longer popular. Second, there is usually insufficient enthusiasm for a stabilization policy (Dornbusch, 1983, p. 229). Third, there is also a possibility of "adjustment fatigue"where the electorates in the debtor country do not believe that more adjustment will bring them relief from declining per capita incomes so that they are not likely to support the austerity program (John Shilling, comments to Cline, 1989, p.194). The fatigue is possible to exist because the GRI has been implementing restraining fiscal policies combined with contractionary policies every single time its current account deficit get worse, since 1976. According to Dornbusch:

> we therefore have to look to ways of shaping a broad social consensus supportive of stabilization....this means, of course that incomes policy is the cornerstone of effective, socially acceptable conditionality. Effective stabilization is, above all, not a technical issue but a political one."(1983, p.229).

He is certain that when incomes policy is assembled in a social consensus on the need for stabilization, then "there is every reason even to apply shock treatment: simultaneous and immediate, credible moves to rectify the entire disarray"(Dornbusch, 1983, p.229). According to Dornbusch, such policy includes "a combination of changes in real prices, fiscal and public sector sanitation, cuts in absorption, wage controls, and sharing rents, but it also includes, as advantage, a full employment and growth policy"(1983, p.229).[12]

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[12]"Such a package is much harder to engineer than 5 percent growth in the money supply, but unless we have the optimism and confidence to try, we might as well be

Multilateral Adjustment

Doing multilateral adjustment is more reasonable than doing the unilateral one because there are many uncertainties surrounding a country in the end of 1990s.[13] Those uncertainties, noticeably, are the interdependency among countries, huge capital movement and volatility of financial markets. The political difficulty discussed previously is higher when the burden of adjustment is not distributed equitably and efficiently among countries and when the shock comes often.

The following facts illustrate such difficulty. First, as evidenced from 42 countries being surveyed by the World Bank; four of the countries dropped their fiscal tightening programs because they experienced severe social unrest when the programs were introduced. The four countries then financed their expansionary fiscal policies with internal borrowing. At the end of the adjustment period, the economies had inflation rates less than 15 percent and succeeded in preventing higher inflation rates.[14] The second example is taken from Denburg from the U.S.A. (1989). In 1985-1987, the U.S. was experiencing a large trade deficit and the dollar was appreciated. The world economic growth was sluggish, so all around lowering of interest rates seemed desirable. The G-5 finance minister meeting in 1987 produced a promise of coordinated actions to lower world interest rates and bring down the dollar (Dernburg, 1989, p.468). However, the promise was not delivered because the

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plumbers" (Dornbusch, 1983, p.229).

[13]Unilateral adjustment is implemented when only the country that shocked more from sudden changes in the international environment has to adjust.

[14]The World Bank only had data on three of the countries: Cote d'Ivoire, Pakistan and the Philippines. The latter had the highest rate of inflation, 15 percent (Jayarajah and Branson, 1995, p.120).

the dollar (Dernburg, 1989, p.468). However, the promise was not delivered because the countries were then persuaded by the U.S. to raise foreign interest rates. Instead of pursuing a more restrictive fiscal policy unilaterally, the Reagan administration asked the other G-5 countries to pursue the expansionary fiscal policies. Such policies would narrow interest rate differentials, reduce the inflow of capital, and depreciate the dollar. But previously the Reagan administration complained that the IMF was being too soft in its lending conditions to developing countries (Cline, 1983, p.207).

According to Dell, sharing the burden and responsibility of adjustment was put in the terms by some of the industrial countries that are now most insistent in pressing for unilateral adjustment by deficit developing countries (Dell, 1983, p.23). In 1973, the US proposed a new system that was designed "to apply equivalent incentives for adjustment evenhandedly to all countries" (Dell, 1983, p.22). The following is the US view of the shortcoming in the adjustment process:

> If countries on both the deficit and the surplus side of a payment imbalance follow active policies for the restoration of equilibrium, the process is likely to be easier than if the deficit countries try to bring about adjustment by themselves. Deficit countries would in any case be unable to restore equilibrium unless surplus countries at least followed policies consistent with a reduction of the net surplus in their payment position (*Economic Report of the President* 1973, pp.124-5, as quoted from Dell, 1983, p.22).

Dell insisted that the concept of unilateral adjustment-with one group of countries at best neutral toward, and at worst frustrating the adjustment process of other group-is not a system. He also reminded that there is a pressing need for the IMF to reconsider its position in this basic issue (Dell, 1983, p.44). More importantly, in the case of external shock the IMF has an obligation to do all it can to assist a member that is suffering the effects of events beyond its control or of injurious policies pursued by other members (Dell, 1983, p.29).

Promotion of Exports

Relying on export growth is the longer term solution for Indonesia (Poot, et al, 1992), like for most indebted countries (Edwards 1989). A study by Wing Thye Woo identified three factors that were responsible for Indonesia's lower debt service ratio relative to Mexico's in 1985 (Woo and Nasution, 1994). Those were concessionairy loans, prudent management of the maturity structure and high export orientation. Woo found that the export orientation explained 31 points of the 57 percentage point difference while the concessionairy interest rates and the currency composition of the debt played only a minor role, less than 6 percentage points (Woo and Nasution, 1994, p.126).

The rupiah will be weaker when the crisis happens. The depreciation has a twofold impact. It may increase export revenue but will certainly increase total debts and debt services in rupiahs. When there is no large and volatile movements of capital, it is safe to assume that under flexible exchange rates, the rate adjusts automatically to balance the current account. The external balance will take care itself. The GRI might just let the rupiah find its equilibrium rate and use its resources to add growth opportunities in the economy instead of adding higher future debt burden to sterilize the economy. Other countries may consider such devaluation as "beggar - thy - neighbor" policy since it is taken below full employment. They may also devalue so that the world economy could suffer competitive depreciation. When there is a large and volatile capital movement, the GRI has to face the external balance the same time it faces its internal balance problems. Should then the GRI implement a large sterilization policy, the kind that is seem possible with huge additional loans such as with the IMF loans? In this regard, it is important to consider the fact that the

IMF policy to give only a small part of the loan at a time actually suggest the same thing, limited stabilization and more of the reforms. Therefore, whether the economy faced volatile or small capital movement, limited stabilization of the rupiah is the only affordable option.

A devaluation affects private investment through several channels (Chhibber and Dailami, 1993, p. 132). First, a devaluation alters the real supply price of capital goods. Second, it affects the real price of imported inputs which are used in conjunction with capital goods to produce output. Third, it has an impact on the real product wage and thereby affects profitability and investment. Fourth, it produces changes in real income which affects the demand for domestically produced goods. Finally, a devaluation affects nominal and real interest rates which in turn have an impact on investment. The short run and long run effects of a devaluation on private investment can go in opposite direction. The short run negative effects appear largely due to contractionary demand effect of a devaluation and to the higher costs of imported inputs into production. However, as the economy responds through higher exports to increased competitiveness, "the long run benefits of devaluation far outweigh the short-run contractionary costs" (Chhibber and Dailami, 1993, p.132).[15]

Since the GRI is supposedly committed to liberalization, letting the rupiah depreciate and supporting the usage of alternative inputs and technology are the only ways available to discourage imports. These solutions were based on those taken by the U.S.A. when it had a substantial current account deficit and the dollar was weak. In 1974, many other

[15]Concluded in the studies by Solimanto A. (1990), and by Chhibber and Shafik (1990).

developed countries were struggling to recover from major recession and attempting to adjust to the damage done to their economies by the rocketing of oil prices. The U.S. agreed to slow inflation and reduce oil imports to reduce demand pressures while the other developed countries agreed to pursue expansionary fiscal and monetary policies.[16] Such agreement was signed in Rambouillet, France, in 1977. The U.S. and the other developed countries also switched to alternative energy for its production. According to Rambouillet arrangement, the surplus country should become the locomotive of the world economy by expanding its internal demand. If the deficit country expands its demand, its current account deficit enlarges (Dernburg, 1989, p.257).

Countercyclical Fiscal Policy

Lower aggregate demand will naturally accompany any economic crisis but budget deficit reduction is the sine qua non of the IFIs package. Is fiscal restraint helpful for the economy? According to Taylor, most governments share at least four economic goals: (1) to maintain socially acceptable levels of capacity utilization and growth, (2) to keep inflation down to a rate tolerable in terms of the country's own history of price increases and social defenses against them; (3) to alter wealth and income distributions in line with the regime's ideological predilections and political constraints; and (4) to maintain a degree of self reliance in trade and external financial relationships (1993, p.71). Therefore, the helpfulness of the restraint policy will be judged by its relation to the achievement of the

[16]Based on the percentage of total trade over GDP, compared to the U.S. economy, the Indonesian economy is more open and dependent on its government involvement in the economy and on the supports from the other economies.

above goals.

First, "not all deficits are irrational and not all add to aggregate demand" (Taylor, 1993, p.71). The WIDER analysts observe that output contraction follows immediately upon imposition of fiscal restraint (Taylor, 1993, p.72).[17] Therefore, the full capacity use of goal number (1) is sacrificed. If austerity persists, growth is not rapid either. The reason is that fiscal contraction has no built in means to assure robust investment demand. Private investment stagnates for at least two reasons. First, the standard reason is that accelerator mechanism will not operate while economic activity is being held down. The IFIs' experience shows that temporarily no investment is to be expected in the adjustment period. It is hard to expect enthusiasm of any investors when the economy has less aggregate demand. One way to build the enthusiasm of the domestic and global capital owners and to prevent the fatigue is by implementing fiscal policy that ensures rapid growth in the post adjustment period. The second reason is that there are structural complementarities between public and private investments. "Some public infrastructures such as education, roads, ...are essentials inputs into private production "(The World Bank, 1995, p.102).[18] With regards to the income distribution, fiscal austerity often involves scaling down social service activities such as education and health, as well as cutting back food subsidies and similar programs. Typically the results are regressive and hurt the poor.

Second, in reality, fiscal reduction is not effective for cutting inflation (see also Cline 1983). The GRI implements some kind of staple food buffer stock (rice and flour), and subsidies for the prices of sugar, medicine and oil to prevent insufficient provision and

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[17]WIDER: World Institute for Development Economic Research.

[18]The infrastructure development will be discussed in point fourth of this section.

volatile price movement. Unlike many developed countries, there are no unemployment benefits to help those who become poorer from bad economic conditions.[19] Such subsidies are usually among the first items likely to be cut in the IMF package.[20] However, to slow the inflation rate, the subsidized prices should not be stopped or reduced significantly until the economy improves. Such improvement is when there is no reason to worry about staple food / oil sufficient provision and when there are enough firms to import them without possibility of charging monopoly prices. Otherwise, the welfare of many Indonesian people is held down from the monopoly of the government to more commercial-profit oriented private monopolist. There will be more people who can not afford to buy the staple foods without the subsidized prices. It is easy to predict that with increased local oil prices many other product prices as well as the transportation cost to deliver many of the products to the remote areas where more poor people live will increase immediately because most of their production use oil instead of other sources of energy. The costs for delivering many of the products to the remote areas where more poor people live or for public transportation in cities will also increase immediately with increased oil prices. In this relation, erasing buffer stock policies or the oil subsidy would easily trigger a higher than manageable inflation rate. Besides, most of the staple food and oil are imported and theoretically the public deficits do not have inflationary impacts when additional public loans were used for increasing the provision of goods and services in the domestic market.

Third, increased interest rates and appreciated currency through a contractionary

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[19]No medical care, food stamps or homeless shelters either.

[20]Such as in Peru case, see Cline (1983), and the World Bank already suggested it (TEMPO Interactive, 17/02 - June 25, 1997).

policy are believed to be able to prevent large capital outflows.[21] However, the tendency of capital flows can be easily triggered by any uncomfortableness of the capital owners. The capital stays in one place only as long as there is growth opportunity. The capital may be parked abroad the minute its owners detect any sign of austerity in the domestic market. Besides, if domestic investment is not strong, the repatriated capital meets no local demand.

Fourth, reducing the fiscal deficit will also cause much larger reduction in output and private investment in Indonesia because many government investment projects are complementary to private investment. According to Marrison and Schwartz, recent studies on productivity growth have focused on public infrastructure and its impact on growth and productivity (1996). They construct a model of firm behavior using the applied production theory based on cost function and then apply it to state-level data for U.S. manufacturing. Their study finds that the infrastructure investment provides significant returns to manufacturing firms and augments growth. But they summarize that the net benefit of infrastructure investment may or may not be positive, depending upon the social cost of infrastructure investment and the relative growth rates of output and infrastructure. The WIDER studies argue that increased public capital formation in developing countries crowds private investment in. The public capital formation did not increase interest rates in financial markets along orthodox lines. There is increasing evidence from the Bank's cross-country studies that points to the importance of a complementary role of public investment, especially in areas where there are large externalities to such investment (1994). Those areas are physical infrastructure involving public goods, natural monopolies or large capital

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[21]Domestic real interest rate = foreign real rate of interest plus expected rate of depreciation. Nominal domestic interest rate = domestic real interest rate plus expected rate of inflation.

investment such as "road and telecommunication networks, power distribution, urban water supply and large irrigation system..."(The World Bank, 1994, p.104). The budget for such investments should not be cut, instead it should be fostered in the adjustment period to ensure rapid growth afterwards. According to the World Bank, under supplying these services can retard sustainable growth. The World Bank also states that as global competition intensifies, the ability to compete successfully in the world market will depend even more on efficient logistical services, such as adequate roads, ports, shipping, air freight, services and telecommunications (1994, p.104). Reducing fiscal deficit will also cause much larger reduction in output and private investment. If the private investment is thereby held down, growth prospects are doubly dimmed-by austerity itself and its effects on capital formation. Since rapid export growth is crucial to successful recovery from any shock, new government investment should go to export industries or into infrastructure that indirectly foster exports. The very last thing Indonesia needs for attracting foreign capital before the AFTA's globalization era is going into recession. The recession will extend investment pause because it prolong the time needed by the investors before making decision.

Expansionary Monetary Policy

According to Little, as capital mobility become high, like in Indonesia, the scope for separate exchange rate and monetary policies is limited (1993, p.250). An intervention designed to depreciate the currency would inevitably increase the money supply as sterilization has little effect. The exchange rate could only be depreciated by a policy of

monetary expansion or appreciated by a policy of monetary contraction. While monetary policy could be targeted on the exchange rate, perhaps with the aim of either stabilizing the nominal rate or the real rate, it could not at the same time be targeted directly on domestic inflation or short term output, or some combination of the two. Furthermore, fiscal policy would then also be tied down, except in so far as nonbank sources of government finance are developed.

There is a trade off between using a contractionary monetary policy to stabilize the exchange rate; that is preventing further depreciation of the rupiah or an expansionary one to support a fiscal policy. In the latter, monetary and fiscal policies are directed to provide stability of output production by providing liquidity credit to the private sector. Such policies lead to an increasing exchange rate. The depreciation has twofold impacts. It may increase export revenue but will certainly increase total debt and debt services in rupiahs. A contractionary monetary policy increases interest rates. Neo-structuralists have emphasized that, given wages and capital, higher real interest rates lead to higher prices or transitory inflation.[22] Dornbusch points out two other ways in which increased financial interest rates have a more adverse effect to the supply side compared to that of the transitory effects (1983, p.227). First, nominal demand given, higher interest rates will not increase prices and lower output but will reduce profit rates. There also could be less business opportunity with the same profit margin in the domestic market / for domestic entrepreneurs

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[22]PQ_t-1=awl_t (1+x)(1+NIR) where P= output prices, wl= wages, X=profit margin, NIR=nominal interest rates. PQ_t=awl_t (1+x)(1+RIR) where RIR real interest rates (Dornbusch, 1983, p.227).

and ultimately lead to bankruptcy of many small businesses.[23] The new rate makes servicing debts more difficult for the private sector especially since their ability to service the debts is already weakened by the depreciation. It makes the cost for borrowing too high and there is not enough market to sell the product with its adjusted price. With the repayment problem, even big businesses do not have access to borrow from abroad anymore. They need liquidity from the domestic banking to pay for their debts and for importing the needed intermediate inputs. Otherwise, they have no sources to acquire foreign currency, so they operate under full capacity of their machines, downsize their employees, sell their assets and most regretfully let their export market taken over by firms from other countries. Meanwhile, even with out the IMF sponsorship, with more liberalization foreigners can own majority shares in local companies and can locate their businesses in small towns where many local firms are relatively very weak compared to multinational corporations. And as credibility of the economy or its currency value gets lower, foreigners can buy domestic firms cheaply, even the best ones, because their stock prices plunged. In other words, domestic firm was either bought by foreigners or had to compete with foreign firms in its worst condition. According to Dornbusch, high real interest rates effect employment and output adversely because firms currently hire labor have to look at the discounted marginal product of labor in all industries, such as agriculture and construction where there are gestation lags (1983, p.227).[24] The implication of this calculation is that, in the short run with given capital and the productivity of labor, higher real interest rates on financial capital lead to a decline in

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[23]When many of their customers are unable to pay, the banks can go into bankruptcy. Such bankruptcy is not helpful to the economy.

[24]That means firms look at real wages $wl_t/[P_t+1/(1+NIR)] = wl_t\ (1+RIR)/P_t$.

employment.[25] Significantly higher than inflation interest rates contribute to existence of moral hazard because only investors with high certainty to fail would like to borrow money while those who are afraid of losing their assets will prefer not to.[26]

Indonesia's labor force grows by at least two percent each year.[27] In a normal situation, at least four million out of almost 200 million Indonesians need to find jobs each year.[28] The number is certainly higher with more people losing jobs from probable downsizing during the standard adjustment program. It is likely that foreign companies / managers may prefer to recruit non Indonesians for their newly bought firms because the education level of the Indonesian people is still low compared to that of the people from Phillippines and other neighboring countries.[29] Industries with less local contents (manufacturing industries) will suffer more than those with less imported inputs (farm industries). Unemployment in urban areas where most manufacturing factories are located will increase while at the same time people from small cities look for job in bigger cities. Such urbanization will augment related social problems, including increase crime rates. By a rough estimate, the economy needs to have 4 percent growth to avoid any "uneasiness"

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[25]Dornbusch argues that the foremost task of stabilization, on the supply side, is to create employment and to raise productivity of capital, not to make financial capital expensive. The positive real interest rates binge is, in his judgment, a very misdirected and poorly founded wing of the free market school (Dornbusch, 1983, p.228).

[26]The creditors do not practice prudent lending policy because the interest rates may already cover the possibility of unpaid loans and because they believe the IMF will help them get paid anyway.

[27]Discussed in Chapter 1.

[28]The population will be more than 200 millions in the year 2000.

[29]High educated Indonesian people will prefer to work for foreign companies to get dollar denominated salary or to wait longer before they find "appropriate" jobs. The results, large brain drain and high unemployment rate among educated Indonesians.

from people who lose or can not find jobs.[30] It is important to avoid making small scale industries loose their chances to survive. Informal and family owned industries are always the last resorts for those lost jobs in the formal sector. They can transfer non tradable to tradable with labor intensive technology. As the rupiah decreases its real value, export opportunity for those commodities might be improving. Therefore, the monetary policy should channel affordable credit for the small local firms with potential exporting capability otherwise the depreciation / external shock will only add nothing but more debt burden.

Debt Reduction

In the short run, the economy faces a double transfer problem. Resources must be transferred abroad to service external debt, but first the public sector must obtain the required foreign exchange from the private sector (Fani and de Melo, 1993, p.9). In other words, when the private sector is "sick," the public sector has difficulties in collecting revenue / foreign exchange. There are two alternatives before asking the creditors to reduce Indonesia's debt burden. The alternatives are either to make more internal borrowing or to recall repatriated capital. Until the end of 1987, 99 percent of the total debts was foreign debt, therefore, there is a room for the GRI to do internal borrowing. The internal borrowing is made either through money creation, regulate reserve requirement, credit rationing to control domestic interest rates or borrowing from banks at market rate, and sales of government bonds in dollars or in rupiahs (Husain and Diwan, 1989, p.95 -114). The

[30]Estimated by the author, considering the need to provide jobs for new comers to job markets, for those who previously work unpaid and for those unemployed since the previous years (excluded those unemployed from recent downsizing). Another factor implicitly considered is the need to produce enough to service external debts.

GRI already tried the first two alternatives. The reserve requirement was raised in 1992. However, servicing domestic public debt is often more expensive than servicing foreign debt because the interest cost of the first continues to exceed the cost of the latter and its real cost increases with further depreciation.[31]

Reflows of flight capital to the highly indebted countries may also help fill their external financing gap. However, the conditions under which flight capital finds it way back are not necessarily conducive to the financial stability of the country. Those willing to bring back their capital will require higher risk premiums, which results in high economy wide real interest rates. They choose to keep the assets in a highly liquid form and do not always invest in the expansion of productive capacity. When there is any possible indication of political or economic uncertainty, these financial assets leave the country, accentuating financial destabilization. Domestic investment by residents also face expropriation risk. The IMF conditionality and its acts as debt collector for international banks made them lend their money without appropriate judgment and encouraged capital flight because loans from outside the country are more likely to be paid. Capital flight might be lessened if saving in the country is as safe as placing funds abroad. If this expropriation asymmetry and uncertain economic environment persist, there is little hope for substantial reflows of flight capital in the near term. Unless the country is able to reduce debt overhang, economic uncertainty and stabilize the economic environment, there is very little hope for significant inflows of capital (Khan and Haque 1985).

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[31]The real cost increases for several reasons. First, the value of the loans in terms of foreign currency decreases with further depreciation. Second, interest rate on the internal borrowing is usually increased following a depreciation even though the rate is already higher than that on the external borrowing. Third, the real value of the loans in domestic currency also decreases when the depreciation is accompanied by higher inflation.

With the present economic condition (discussed in Chapter II), especially high accumulation of short term loans and dependence on foreign capital, it is perhaps very hard to avoid the need for asking for debt rescheduling or may be even for a debt reduction when a crisis comes. Adding more loans is not recommended because it will add higher burden in future. It also will discourage private sector because they are expected to pay higher taxes to cover the debts. Besides, the loans will only come with higher interest and more (implicit) conditionality.[32]

The real magnitude of the debt is considered less important than its relative size, debt / GDP ratio. There are three ways to reduce the relative size or to increase debt sustainability. Those are: (1) increase growth rate of the economy, (2) reduce the primary deficit, and (3) restructure the debts to reduce the stock and interest rates on the debts.

In most cases, reducing the primary deficit is a must. The long run dynamic of budget deficits is such that the growth of revenues must exceed the average interest rate paid on the outstanding debt as long as the government run primary deficit (Little, 1993, p.319). The GRI took adjustment loans in 1986. It decreased its relative debt burden through growth and reduction of the primary deficit. Real public expenditures stagnated after 1982 and even declined from 1985 and 1987 (Thorbecke, 1992a, p.108). According to

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[32]It is rational to expect that over the years the IMF may find that it becomes more difficult for it to ask private creditors for helping "no longer good debtor" or for the governments of the United States, Japan, Germany and other big countries to get approval from their peoples for funding the efforts to rescue the "competitors" unless the IMF convince them that the payback is guaranteed and "huge." It also rational that with more loans in addition to weakened local private sector the debt ridden economy become more vulnerable to external forces and is likely to be sicker when faces another shock. Mexico is the best example, it needed larger and larger debts for its crises. Gunboats are the borrower's best friend because only when "larger exogenous penalty can be imposed" will creditors lend more (Cline, 1995, p.140).

Thorbecke, the relative burden (debt service ratio) was increased from only 6 percent in 1980 to 34 percent in 1988 with an almost 7.5 percent annual growth rate of the economy from 1980 - 1988 (1992a, p.109).

The third way to reduce debt is by debt restructuring, reduction of the debt stock or interest rate relief. The 1980s debt crisis brought a distinct new stage characterized by external debt reduction (Silvina Vatnik, comments, 1989, p.175). Vatnik predicts that voluntary debt reduction will form an important part of debt negotiations.[33] Reduced interest on existing debt instruments, has not so far been put into practice as another type of debt reduction (Hussain and Mitra, 1989). The reduce interest rate option is attractive from the debtor's point of view as they receive substantial relief in cash flow. As reduced interest is tied to economic performance, the fear of moral hazard is also, to a large extent, neutralized. A case by case approach to interest reduction negotiated in the framework of an agreed structural adjustment program can make a significant dent if the accounting and tax rules are modified to strengthen the incentives for the commercial banks. The present tax and accounting rules in the U.S.A. do not provide any incentive for the banks to agree to reduction in interest rates. A variant of reduced interest rates that is attractive analogous to warrant attached to bond issues. If the country's major exports commodities register an upward swing relative to the threshold, the creditors participate in the gains proportionately and the interest rate reduction earlier is brought closer to the market rate in accordance with the country payment capacity. In their review on the adjustments experience of highly

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[33]See Husain and Mitra (1989) for debt reduction measures. The measures are classified as: (a) exchange of foreign debt against domestic assets (debt equity conversion; (b) exchange of foreign assets against another foreign assets at discount; (c) debt buy backs; and (d) debt servicing reduction through reduced interest rates (Husain and Mitra, 1989, p.206).

indebted countries, Little and other authors suggest that servicing debt and doing the stabilization at the same time would be much easier when the deficit is financed by interest relief (Little, 1993, p.398; Echengreen and Portes, 1989, p.75).

All transactions classified as debt reduction are also liability reductions. Debt equity swaps only reduce liability to the extent that the swap occurs at less than face value. There are other alternative or menu options but John Shilling suggested that in analyzing debt reduction and guarantee options, greater consideration should be given to alternatives that reduce debt service or cash-flow burden in the short term than to debt reduction instruments that may have a short-term cash-flow cost or little cash-flow benefit (John Shilling (comments), 1989, p.195). The existing rules and precedents were set to facilitate new-money flows. It is prejudged that the credit enhancement or the resources for debt buy backs provided by the IFIs would not be sufficient to make a significant difference in the larger debtor countries. The Brady initiatives, announced in March 1989, depart significantly from the existing debt strategy. They allowed the use of financial resources of the International Financial Institutions in support of debt and debt service reduction in countries pursuing strong adjustment policies. It was inspired by Mexico's condition which ran primary surplus but had a very high debt services.

Another factor to be considered for giving debt relief is the tendency of a very large stock of debts to act like a high marginal tax on successful adjustment (Sachs, p.277). According to Sachs:

> "Two counterintuitive propositions could be true when a country is deeply indebted:"Good behavior" (such as a higher investment rate) can actually reduce national welfare, by increasing the transfer of income from the debtor country to creditors; and explicit debt relief by creditors can increase the amount of actual debt repayment by improving the incentive of the debtor country to take the necessary adjustment" (1989, p.277).

Many observers have cautioned debtors that a moratorium or default may offer macroeconomic benefits in term of scope for deflationary policies but it may also have macroeconomic costs in term of disruptions to export and capital market access. Exporters may encounter difficulties in obtaining trade finance or suffer retaliatory trade sanctions (Eichengreen and Portes, 1989, p.74). It is also recognized that debt reduction, beyond a certain limited scale, would impose additional financial costs on the commercial banks. In turn, it may cause a higher average rate of inflation universally.

Lindert and Morton state that "partial debt write-downs can work, and have worked, in a variety of ways" (1989, p.233). They explain how some economies are helped by debt reduction. According to the authors, the coming of foreign investors to Brazil was not discouraged by her debt servicing records (Lindert and Morton, p.233). They also noticed that the Mexican economy became more attractive to foreign capital after it stopped paying its debts (Lindert and Morton, p.233). Mexico was then asked to join Canada and the U.S. in the North America Free Trade Agreement (NAFTA).

When a private debt repayment problem happens, the Indonesian economy can not lose more and may be even gain from "admitting" its "credit unworthiness."[34] It is because, with the AFTA liberalization schedules and the reforms implemented by its members, there will be investment pause anyway. Besides, countries seeking for any debt reduction are considered as having defaults even if they only ask for some rescheduling measures for the private debts.

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[34]There is not much incentive for being a good borrower except that of receiving more "support" to become a larger debtor. The GRI did not get any "other than the access to larger and more expensive loans reward" for being a good payer or for its efforts in the previous adjustment while countries with bad report card of debt servicing (17 high indebted countries, including Mexico and Brazil) enjoyed some kind of debt reduction.

Summary

In order to prevent a severe investment pause and heavy unemployment as well as to help the private sector and create growth opportunity, a deficit country with low inflation rates and primary surplus should consider to plan a modified version of the standard adjustment policy.

In this study, the alternative policy is called the strategic reform policy. It is based on a genuine commitment to strengthen domestic economy's condition. It stresses the importance of a Countercyclical fiscal policy as the key to reconciliation of growth and debt within reasonable inflation targets (Ahmed and Chhibber, 1989, p.47). The strategic reform policy for the Indonesian economy prescribes measures to prevent severe unemployment in the recession and to strategically nurture the economy's local strength for its long term benefit. The Indonesian economy has low inflation rate and the GRI should not jeopardize the future of the whole economy when faces a debt crisis. In addition, the policy should be implemented only after the government gets social support and in a situation where countries share the burden of taking the necessary adjustment. Among the necessary adjustment is the government should restraint itself from taking huge loans from the IMF or from other sources and should start the austerity policy with a reduction in its personnel expenditures. More importantly, the government should prevent export constraint and should try to adopt a debt reduction scheme when the crisis comes. Table 3.1. provides comparison and examples of the standard and the strategic policies.

TABLE 3.1

COMPARISON AND EXAMPLES OF THE STANDARD
AND THE STRATEGIC REFORM POLICIES

	Standard Reform Policy	Strategic Reform Policy
1	Based on donor consensus - start with reductions in government subsidies (* put priority on cutting food and fuel subsidies)	Based on domestic social consensus - start with reduction in government operational expenditures (* reduction in government personnel expenditures)
2	Unilateral adjustment - need huge public borrowing for government intervention in foreign exchange market - surplus countries at best neutral	Multilateral adjustment - surplus countries help by buying rupiah, open their economies for Indonesian commodities
3	Procyclical fiscal policy (fiscal restraint)** * decrease health and education subsidies * increase tax rates to compensate loss of government income from liberalization	Countercyclical fiscal policy (fiscal expansion)** * increase health and education subsidies * increase government income by giving more firms a chance to survive so they will be able to pay taxes
4	Contractionary monetary policy * increase interest (discount) rate * decrease credit creation	Expansionary monetary policy (supporting to fiscal policy) * decrease interest (discount) rate * increase credit creation
5	Fulfill debt obligation - cut other government expenditures in order to fulfill debt obligation	Include debt reduction scheme * reduce interest payment on public debts - rescheduling of private debts
6	Promotion of imports to decrease inflation (assumes the country has unacceptably high inflation when the crisis starts)	Delay cut on government subsidies on staple food and on fuel to control inflation (assumes the country has low inflation when the crisis starts)
7	Promote recession and does not mind heavy unemployment or a possibility to lose export market	Avoid recession and heavy unemployment plus promote exports to increase ability to service debts

Note:
* = An example of the program which is included in the simulation.
- = An example of the program which is not included in the simulation
** = with regards to the expenditures other than those for principal and interest payments

CHAPTER IV

DESCRIPTION OF RELATIONSHIPS IN THE COMPUTABLE GENERAL EQUILIBRIUM MODEL

A CGE model is a general equilibrium system derived from micro and macro economic theories. It assumes that the economy is in equilibrium. Equations in the model should reproduce base run data of the social accounting matrix (SAM) as a model solution. Parameter values of the equations in the model are crucial. Slight changes in some of the parameters may influence results. Some of the parameters are either taken from previous studies or calibrated. The calibration procedure is the process of solving the model for parameters using benchmark or base year values of endogenous and exogenous variables (Koh, 1991). Once parameters are calibrated, the model equations are solved simultaneously for the endogenous variables given values of the exogenous variables. There are several steps in building a computable general equilibrium (CGE) model. The first one is to understand the SAM. The next step is to distinguish exogenous and endogenous variables in their relationships in the SAM then try to build a CGE model by representing those relationships with a system of equations.

Organization of this chapter follows the steps needed in building the CGE model. Section one is an introduction to the SAM structure with variables to be used later in the equations. Section two focuses on 63 main relationships in the model. The last section compares the model solution with data from the SAM.

Understanding SAM Structure

The SAM provides data that are organized as a consistent framework of transactions for a particular year in an economy. There is a certain way in reading a SAM. Each row of the SAM represents receipt accounts while each column represents expenditure accounts. The respective rows and columns have to balance. For instance, the summation of households total income from working as labor, renting its resources as factors of production, and from receiving transfers from other households, firms, government and the rest of the world, in row three - Table 4.1, should be equal to their total expenditures in column three. A summary of the contents of the SAM table (12 x 12) is displayed in Table 4.1. For example, production activities are disaggregated into 22 sectors (i = 1 to 22) with each sector producing only one commodity (m =1 to 22). The production activities are summarized in column six (6) where value added is disaggregated into accounts representing industry purchases of capital and labor (row 1, 2 column 6) and raw materials (row 8, 9). Institutions (households, firms and government) pay part of the factor incomes back to households in the form of dividends, interest, and rent. The purchases of capital and labor are then translated into factor incomes (row 3, col.1 and row 3, 4, 5 col.2). Columns of the capital account (10) record domestic and imported capital investment, while rows (10) record savings from various institutions as well as from the rest of the world. Purchases of commodities from abroad are recorded in row 12 - column 9 as imports of goods and services including cost, insurance and freight (cif). The total imports in customer prices is shown in row and column 9, total.

In the discussion, variables displayed in the SAM are to be referred to with names

TABLE 4.1

STRUCTURE OF INDONESIA SOCIAL ACCOUNTING MATRIX, 1990

Expenditures Receipts			Factor of Production		Institutions		
			Labor	Non Labor	Households	Companies	
			1	2	3	4	5
Factors of Production	labor	1					
	Non Labor	2					
Institutions	Household	3	Allocation of labor income to Households	Allocation of nonlabor income to Households	Current transfer between households	Transfer to households	
	Companies	4		Allocation of non labor income to Companies		Current transfer between companies	
	Government	5		Allocation of non labor income to Government	Direct tax from households	Direct tax from companies	
Production Sector		6					
Trade and Transportation Margin		7					
Commodity	Domestic	8			Households consumption expenditures on domestic commodity		
	Imported	9			Households consumption expenditures on imported commodity		
Capital Account		10			Household saving	Retained earning	
Net Indirect Tax		11					

TABLE 4.1 Continued

Expenditures / Receipts		Factor of Production				
		Labor	Non Labor	Institutions	Companies	
		1	2	3	4	5
ROW Account	12	Labor income to ROW	Profit to ROW	Transfer from household to ROW	Debt interest	
Total		Total labor expenditures	Total non labor expenditures	Total household expenditures	Total companies expenditures	

TABLE 4.1 Continued.

Expenditures Receipts			Institutions Government	Production sector	Trade margin and Transportation cost	
			5	6	7	8
Factors of Production	labor	1		Value added payment to labor		
	Non labor	2		Value added payment to no labor		
Institutions	Household	3	Transfer and subsidy from government to households			
	Companies	4	Transfer and subsidy from government to companies			
	Government	5	Transfer between government			
Production Sector		6				
Trade margin and Transportation cost		7				
Commodity	Domestic	8	Govt. Current expenditures on domestic comm.	Raw material purchases of domestic goods	Trade margin and Transportation cost	
	Imported	9	Govt. Current expenditures on imported comm.	Raw material purchases of imported goods		
Capital Account		10	Govt. Saving			
Net Indirect Tax		11				
ROW Account		12	Govt. Debt services (interst payment)			
Total			Total government. Expenditures	Total input cost	Total trade margin and transportation cost	

TABLE 4.1 Continued

Expenditures / Receipts			Commodity		Capital account	
			Domestic Comm.	Imported Comm		
			8	9	10	11
Factors of Production	labor	1				
	Non labor	2				
Institutions	Household	3				
	Companies	4				
	Government	5				
Production Sector		6	Production cost			
Trade margin and Transportation cost		7	Trade margin and Transportation cost of domestic commodity	Trade margin and Transportation cost of imported commodity		
Commodity	Domestic	8			Investment on domestic capital goods	
	Imported	9			Investment on imported capital goods	
Capital Account		10				
Net Indirect Tax		11	Net indirect tax minus subsidy	Import duties and tax minus subsidy		
ROW Account		12		Import of goods and services in cif		
Total			Total cost of domestic commodity	Total cost of imported commodity	Gross accumulated expenditures	

TABLE 4.1. Continued

Expenditures / Receipts			Net indirect tax	ROW account	Total
			11	12	
Factors of Production	labor	1		Labor income from ROW	Income of factor of production (labor)
	Non labor	2		Non labor income from ROW	Income of factor of production (non labor)
Institutions	Household	3		Transfer from ROW to households	Household income
	Companies	4		Transfer from ROW to companies	Companies incomes
	Government	5	Government revenue from indirect tax	Transfer from ROW to government	Government income
Production Sector		6		Export of goods and services in fob	Revenue from domestic
Trade margin and Transportation cost		7			Trade margin and transportation cost
Commodity	Domestic	8			Revenue from domestic commodity (customer price)
	Imported	9			Total import (customer price)
Capital Account		10		ROW saving	Gross accumulated expenditures
Net Indirect Tax		11			Total indirect tax
ROW Account		12		net capital transaction to and from ROW	Total revenue on current account and ROW account
Total			Total indirect tax	Total revenue on current account and ROW account	

TABLE 4.2.

VARIABLE NAMES FROM INDONESIA SAM

	1	2	3	4	5	6	7	8	9	10	11	12	Total
	1-16	17-23	24-33	34	35	36-57	58/9	60-81	82-103	104	105	106	
1						VAL						YLFROW	YL
2						VAK						YKFROW	YK
3	YLH	YKH	HTH	FTH	GTH							ROWTH	HY
4		YKF		FTF	GTF							ROWTF	FY
5		YKG	TH	TF	GTG						TI	ROWTG	GR
6								Q					Q
7								MTD	MTM				MT
8			HCD		GCD	DDIN	MTT			ITD		XSD	DD
9			HCM		GCM	DMIN				ITM			MD
10			HS	FS	GS							ROWSV	SAVTL
11								TID	TIM				TI
12	YL-TROW	YK-TROW	HTROW	FDS	GDS				MGS				ROWREV
Ttl	LEXP	KEXP	HEXP	FEXP	GEXP	RAWMAT	MT	DEXD	MEXP	CAPTL	TI	ROWEXP	

TABLE 4.3.

INDONESIA SOCIAL ACCOUNTING MATRIX, 1990 (Rp BILLION)

	1	2	3	4	5	6	7	8
	1-16	17-23	24-33	34	35	36-57	58-59	60-81
1						94,027.08		
2						104,570.02		
3	94,027.12	49,808.87	5,130.12	242,74	5,723.37			
4		43,207.88		1,296.71				
5		1,937.79	1,997.80	21,121.26	3,724.01			
6								359,115.32
7								30,575.13
8			117,736.97		14,348.63	128,651.83	40,108.53	
9			9,539.94		1,154.15	31,866.58		
10			24,085.95	19,667.51	12,010.00			
11								9,204.50
12		10,773.95		7,519.83	4,555.00			
Total	94,027.12	105,728.49	158,544.78	49,848.16	41,515.16	359,115.51	40,108.53	398,894.95

TABLE 4.3 (Continued)

	9	10	11	12	Total
	82-103	104	105	106	
1					94,027.08
2				1,158.47	105,728.49
3				3,612.56	158,544.78
4				5,343.46	49,848.05
5			12,269.42	464.88	41,515.16
6					359,115.32
7	9,553.40				40,108.53
8		44,760.40		53,288.65	398,895.01
9		20,029.55			62,644.22
10				9,026.49	64,789.95
11	3,064.94				12,269.44
12	50,045.73				72.894.51
Total	62,644.73	64,789.95	12,269.42	72,894.51	

Source: SNSEI, p.23.

shown in Table 4.2. The names begin or end with H, F, G or ROW are related to transactions done by / to households, firms, government or rest of the world correspondingly. Consumption and investment are shortened by C and I, such that HC stands for household consumption. Other variables are referred with abbreviations that are closest to their full names. For examples, VAL for value added, DIN for demand for intermediate inputs, etc. The complete names for the variables and parameters are provided in Appendix C: Tables 1 to 3. When necessary, explanation about relationships in the model specifies locations in the SAM table of the variables involved. Magnitudes of the base run variables are displayed in Table 4.3.

Relationships in the CGE Model

The model is designed to specify the relationships in the real and financial sectors. Overall, the model will show how prices of commodities, nominal interest and nominal exchange rates affect the current account balance and the fiscal deficit. A researcher will be able to determine the impacts on these two accounts of any changes in the world price of imports or in the exchange rate. The capital market is assumed to be imperfect such that a relative version of purchasing power parity is appropriate for calculating changes in the expected rate of devaluation and domestic interest rates. There can be simultaneous changes in the exogenous variables as well as in various policy instruments, such as tax rates, exchange rate and government consumption. The following are equations that represent the relationships integrated in the CGE model. Variable and parameter names are listed in Appendix C: Tables 1 to 3. The equations are numbered in the order of their appearance

in the program (Appendix D.1). Those equations with numbers and letters explain either the derivation of the equations shown in the program or relationships between one equation with another which are shown also in the program. Therefore, those equations with numbers and letters themselves are not shown explicitly in the program because they explain the numbered equations shown before or after them. Subscripts i and j are shown in the equations to indicate sectoral (row and column) while superscripts h, g or others refer to the agents. The subscripts i and j are not shown in the text to help readers understand the variables used in the program. The program is in GAUSS language. The main program is presented in Appendix D.1.

Production Function

The production technology is represented by a production function or functional form with implied assumptions about factor substitutability. The choices of technology depend on data and level of aggregation available (Dervis, de Melo, Robinson, 1982, p.141). To allow flexibility in modeling behavioral features at different levels of production, a two or three level nested production function is used. The CGE framework can accommodate a wide variety of technology specifications. At level one, the Leontief functional form which implies no substitutability among factors is mostly adopted to represent fixed coefficient of primary (capital) and composite intermediate inputs used (Budiyanti, 1996, p.39). At the second level, constant elasticity of substitution (CES), constant elasticity of transformation (CET), Cobb-Douglas (CD) or constant ratios of elasticities of substitution (CRESH) functional forms are appropriate to capture the elasticity of substitution among primary

factors. At the third level, substitutability between different skills of labor can be modeled either by CD, CES, or CRESH.

Following a model in Thorbecke (1992a, p.227), the CES function is used in the labor and capital relationships in the production, but without further specification of labor skills. Sectoral outputs (Q) are produced by labor and capital in Equation 4.1 where sectoral labor (LD) and capital (KD) substitute for one another with constant sectoral elasticity of substitution (σ). The magnitudes of the sectoral elasticity of substitution determine the responsiveness of capital demand to changes in the relative price of labor brought about by trade and exchange rate policy or exogenous events (Dervis, de Melo, Robinson, 1982, p.222).

$$(4.1)\ Q_i = \Phi_i^{LK}\left[\delta_i^{LK} LD_i^{\rho_i^{LK}} + (1-\delta_i)\, KD_i^{\rho_i^{LK}}\right]^{\frac{1}{\rho_i^{LK}}}$$

Production Function in the Long Run. In the CGE model by Thorbecke and team, the long run production function is influenced by past cumulative government investment and regulation, as well as by current government investment (1992a, p.227). The model for this study simplified such relationship further by assuming the government total investment ($GINV$) is the only variable to influence the long run production function. The regulation in the Indonesian economy is not seen as another determinant since the GRI is willing to treat foreign investors the same way it treats domestic investors. Equation 4.2 shows the long run production function.

$$(4.2)\ Q_i = a_i^{gi} * GINV\left[\delta_i^{LK} LD_i^{\rho_i^{LK}} + (1-\delta_i)\, KD_i^{\rho_i^{LK}}\right]^{\frac{1}{\rho_i^{LK}}}$$

Considering what variables influence the $GINV$, Equation 4.2 pictures a reality of the

dependence of the Indonesian economy to external borrowing for financing its growth. See Equation 4.35 for details of the government investment.

Equation 4.2 is based on Equations 4.2a and 4.2b.

$$(4.2a)\ \Phi_i^{LK} = a_i^{gi}\, GINV$$

where a_i^{gi} is calibrated as

$$(4.2b)\ a_i^{gi} = \frac{\Phi_i^{LK}}{GINV}$$

Domestic Sales

The decision regarding how many outputs will be imported or produced domestically is mirrored through an Armington function, that is by applying the CES function. The Armington assumption is an important assumption that is implied in most CGE models. It states that consumers do not view domestic and imported goods as perfect substitutes. When they are perfect substitutes, the economy may specialize narrowly in few commodities only. Outputs that are produced domestically and sold in the domestic market are referred to as domestic sales (DS). Equation 4.3 shows that the choice between the domestic and imported commodities (DS and MGS) is based on the relative prices in those markets and substitubility of the commodities as specified by the elasticity of substitution (ρ_i^M).

$$(4.3)\ DS_i = MGS_i \left[\left(\frac{1-\delta_i^M}{\delta_i^M} \right) \left(\frac{PM_i}{PD_i} \right) \right]^{1/\rho_i^M}$$

where δ_i^M is the share parameter $(0 < \delta_i^M < 1)$, PM are sectoral prices of imported

commodities, and PD are sectoral prices of domestic commodities. Values of the share parameters are presented in appendix D.2.

Demand for Intermediate Inputs

Expenditures for composite (domestic and imported) input materials (DIN_{ji}) are inter industry transactions. Their magnitudes are proportional to the sectoral outputs (Q). The sectoral demand of the total intermediate goods (DIN) is ussually defined as a summation of the inter industry transactions.

(4.4*a*) $DIN_i = \sum_j DIN_{ji}$

where DIN_{ji} is a proportion (α_{ji}^{DIN}) of the sectoral outputs (Q). This relationship is shown in Equation 4.4b.

(4.4*b*) $DIN_{ji} = \alpha_{ji}^{DIN} Q_i$

The total expenditures for intermediate inputs (DIN) is also total value of the outputs minus total value added of the primary inputs (labor and capital). The total value added (VA) is a certain proportion of the total output (see Equation 4.14). Therefore, the relationship between the demand for intermediate inputs and the sectoral production, as shown in Equation 4.4c, can be summarized as one minus the proportion of value added times the sectoral outputs.

(4.4*c*) $DIN_i = Q_i - VA_i = Q_i - \alpha_i^{VA} Q_i$

(4.4*d*) $DIN_i = (1 - \alpha_i^{VA}) Q_i$

(4.4) $DIN_i = \alpha_i^{DIN} Q_i$

The demands for imported and domestic intermediate inputs are derived demands of output. They depend on their relative prices as well as the elasticity of substitution (ρ_i^{DIN}) between the sectoral demand of intermediate imported goods (*DMIN*), and sectoral demand of intermediate domestic goods (*DDIN*). The relationship between them is based on constant elasticity of substitution (CES) assumption. It is shown in Equation 4.5a.[1] The CES assumption implies that the domestic and imported inputs of the production imperfectly and smoothly substitute for each other. The elasticities of substitution (ρ_i^{DIN}) are taken from Lee (1993, p.76) and their magnitudes are provided in appendix F.

(4.5*a*) $$DIN_i^{DIN} = \Phi_i^{DIN}\left[\delta_i^{DIN} DMIN_i^{\rho_i^{DIN}} + (1-\delta_i^{DIN}) DDIN_i^{\rho_i^{DIN}}\right]^{-1/\rho_i}$$

(4.5*c*) $$\sigma_i^{DIN} = \frac{1}{1-\rho_i^{DIN}}$$

(4.5*d*) $$\frac{DDIN_i^{DIN}}{DMIN_i^{DIN}} = \left[\left(\frac{1-\delta_i^{DIN}}{\delta_i^{DIN}}\right)\left(\frac{PM_i}{PD_i}\right)\right]^{\sigma_i^{DIN}}$$

(4.5) $$DMIN_i = DDIN_i\left[\frac{\delta_i^{DIN}}{\left(1-\delta_i^{DIN}\right)}\left(\frac{PM_i}{PD_i}\right)\right]^{\sigma_i^{DIN}}$$

where φ_i^{DIN} = (sectoral) intermediate input efficiency parameter ($\varphi_i^{DIN} > 0$)

δ_i^{DIN} = the (sectoral) share parameter ($0 < \delta_i^{DIN} < 1$)

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[1]The inter industry relationship between domestic and imported inputs is as shown in Equation 4.5b.

(4.5*b*) $$DIN_{ji} = \Phi_{ji}^{DIN}\left[\delta_{ji}^{DIN} DMIN_{ji}^{\rho_j^{DIN}} + (1-\delta_{ji}) DDIN_{ji}^{\rho_j^{DIN}}\right]^{-1/\rho_j^{DIN}}$$

σ_i^{DIN} = elasticity of substitution (sectoral)

ρ_i^{DIN} = the (sectoral) substitution parameter $(-1 < \rho_i^{DIN} \neq 0)$

PM_i = the price of imported commodities of sector i

PD_i = the price of domestic commodities of sector i

Labor

Indonesia has minimum wage laws that states sectoral minimum wages (WL) are set with considerations of the general price index (GPI), changes in labor productivity and other regulations. The GPI is defined in Equation 4.6 as a summation of the proportional values of sectoral consumption by household and government (HC and GC) to their total consumption.

$$(4.6)\ GPI = \sum_i^m \left[\frac{(HC_i + GC_i)}{\sum_i^m (HC_i + GC_i)} PC_i \right]$$

The wage laws prevent the labor market from determining wage rates freely (Thorbecke, 1992, p.222). By setting sectoral minimum wages, the model does not assume that each labor is paid the same regardless of his / her skill but that the individual labor receives at least the minimum wages and that those who work in one industry have different minimum wages than what workers in the other industries may have. The minimum sectoral wages is shown in Equation 4.7.

$$(4.7)\ WL_i = GPI\,(1 + CPQ)\,\alpha^{WL} \left(1 + \frac{DS_i}{LD_i} \right)^{\beta^{WL}}$$

CPQ is a change in output prices (PQ) represented by changes in sectoral farm food prices.

α^{WL} and β^{WL} are a constant and a share parameter related to changes in labor productivity. The productivity of labor is related to a proportion of sectoral domestic outputs to sectoral demand of labor (DS / LD). Equation 4.7 is a simplification of Equation 4.7a (Thorbecke, 1992, p.228).

$$(4.7a)\ WL_i = GPI^{\alpha_1^{WL}} \left(1 + CPQ\right)^{\alpha_2^{WL}} \left(1 + \frac{dDS_i}{LD_i}\right)^{\alpha_3^{WL}}$$

There are three different elasticities in Equation 4.7a. First, price level elasticity of the sectoral wages (α_1^{WL}). Second, elasticity of the sectoral wages to changes in sectoral equilibrium prices (α_2^{WL}). The elasticities are assumed as positive one. Third, elasticity of the sectoral wages to labor productivity (α_3^{WL}). dDS / LD is an estimate for the rate of increase of labor productivity.

It is assumed that the firms hire labor with profit maximization objectives. Equation 4.8 is derived from the value added function.[2]

$$(4.8)\ LD_i = \frac{\alpha_i^L PN_i Q_i}{WL_i}$$

PN is sectoral net prices or per unit value added, Q is sectoral output production and α_i^L is

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[2]Each of the valued added function is specified using the Cobb Douglas (CD) function for deciding a composition of factor production to be used (Negash, Lee and Schreiner, 1994, p.23).

$$(4.14b)\ VA_i = \varphi_i^{VA} LD_i^{\alpha_i^L} KD_i^{\alpha_i^K}$$

the contribution of labor to total value added of production.[3]

Total employment (LDT) is a summation of sectoral demand of labor and is responsive to changes in the relative prices of factors. This relationship is shown in Equation 4.9.

$$(4.9)\ LDT = \sum_i LD_i$$

Equations 4.8 and 4.9 imply that a trade policy that simulated more labor intensive production activities may increase employment and outputs (Dervis, de Melo, Robinson, 1982, p.213).

Equilibrium for labor market happens when total supply of labor (LST) is equal to total demand for labor and a number of unemployed people ($UNEMP1$). The relationship is presented in Equation 4.10.

$$(4.10)\ LST = \sum_i LD_i + UNEMP1$$

Magnitude of the labor supply is given so that the number of unemployment is a residual between the supply and total demand of labor.

The model defines unemployment rate ($UNEMP2$) as a percentage of labor supply (LST) that is unemployed. This is given by Equation 4.11.

$$(4.11)\ UNEMP2 = 100\ \frac{UNEMP1}{LST}$$

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[3]The SAM provides division of labor by skills into six categories for each of the 22 industries but with out further information on the numbers of labor in each skill category. Since this study concerns with provision of jobs in general, skill categories are not applied in the CGE model.

Capital

Remuneration and sectoral demand for the capital (RK and KD respectively) are also determined by profit maximization.[4] They are shown in Equations 4.12 and 4.13. Sectoral payments received by the capital owners are sectoral composite value added minus payments to the labor divided by sectoral demand of capital (4.12).

$$(4.12)\ RK_i = \frac{\left(PN_i\, VA_i - WL_i\, LD_i\right)}{KD_i}$$

Sectoral capital demand (KD) is assumed as a constant proportion of output production.

$$(4.12a)\ KD_i = 0.09\, Q_i$$

We assume constant returns to scale so that α_i^K is 1 minus α_i^L. Contribution of the capital (α_i^K) is defined in Equation 4.12b.

$$(4.12b)\ \alpha_i^K = 1 - \alpha_i^L$$

Capital market is in equilibrium when total demand for capital is equal to total supply of capital (KST).

$$(4.13)\ KST = \sum_i (0.09\, Q_i)$$

Value Added Function

The value added of production (VA) is a fixed proportion of the total outputs (Q).

[4]Details on the derivation is in the calibration section, Equations 4.14b - 14f.

The relationship is shown in Equation 4.14.

(4.14) $VA_i = \alpha_i^{VA} Q_i$

The sectoral value added is a summation of sectoral value added contributed by the labor and capital (see 4.14a).

(4.14*a*) $VA_i = VAL_i + VAK_i$

Sectoral value added of the labor (VAL) and sectoral value added of the capital (VAK) are calculated from the amount paid to each factor (WL and RK) times the number of factors employed (LD and KD) in the production. The sectoral value added of the factors are reflected in Equations 4.15 and 4.16.

(4.15) $VAL_i = WL_i\, LD_i$ / 1,000,000

(4.16) $VAK_i = RK_i\, KD_i$ / 1,000,000

The multiplication of WL and RK has to be divided by a million because WL and RK are denoted in Rp. thousand while VAL is in Rp. billion.

Capital is owned by households, firms and government. Their respective incomes are assumed to be proportional to sectoral composite value added of capital. See Equations 4.16a to 4.16c.

(4.16*a*) $YKH = (\alpha^{kh}) \sum_i VAK_i$

(4.16*b*) $YKF = (\alpha^{kf}) \sum_i VAK_i$

(4.16*c*) $YKG = (\alpha^{kg}) \sum_i VAK_i$

YKH, YKF and YKG are respective households, firms and government incomes as capitalist. The proportions of capital owned by the institutions are shown as α^{kh}, α^{kf} and α^{kg}.

Household Income and Expenditure

Household income is a summation of factor incomes and transfers from / between the three institutions and from rest of the world. Households receive incomes mainly from selling their resources as labor (VAL) and capital / YKH (see Equation 4.16a). They also get transfer payments from other households (HTH), firms (FTH), government (GTH) and rest of the world ($ROWTH$). GTH is actually government subsidies for health and education. The $ROWTH$ is converted to rupiah when it is included to the total household income (HY).

(4.17) $HY = \sum_i VAL_i + YKH + HTH + FTH + GTH + ER\ ROWTH$

Households spend their incomes on consumer goods and services (household total consumption / HCT), on saving (HS), on transfers to other households (HTH), and on paying taxes (TH). Equation 4.18a shows components of the total household expenditures ($HEXP$) and that the expenditures equal income (HY).

(4.18*a*) $HEXP = HCT + HS + HTH + TH = HY$

The households have to pay taxes at a certain rate and they decide their saving by considering nominal interest rates. Household disposable income (HYD) is defined in Equation 4.18.

(4.18) $HYD = (1 - htx)\ HY$

where htx is household income tax rate.

The magnitude of transfer among households (HTH) is ussually assumed as given. Therefore, in the model the household total consumption expenditure (HCT) is a residual

of disposable income (HYD) minus saving (HS) and transfer payments to other households (HTH). The household total consumption is shown in Equation 4.19.

(4.19) $HCT = HYD - HS - HTH$

The household total consumption can also be viewed as a summation of sectoral consumption demand. Sectoral share of household consumption (S_i^h) is then used to calculate sectoral consumption (HC) in Equation 4.20b.

(4.20*a*) $HCT = \sum_i PC_i HC_i$

(4.20*b*) $HC_i = \frac{S_i^h HCT}{PC_i}$

Equation 4.20b is written in a different way in the program, see Equation 4.20.

(4.20) $PC_i HC_i = S_i^h HCT$

Firm Income and Expenditure

Companies collect revenues from various sources, but mainly from capital (YKF / 4.16b). As in the household case, the companies also receive and transfer among themselves (FTF) and from abroad ($ROWTF$). Firm income (FY) is determined in Equation 4.21.

(4.21) $FY = YKF + FTF + GTF + ER\ ROWTF$

Firm's disposable income (FYD) is shown in Equation 4.22, where ftx is the rate of firm income tax.

(4.22) $FYD = (1 - ftx)\ FY$

The firm has to pay direct taxes (TF), transfer to their subsidiaries or other firms

(*FTF*), households (*FTH*), and an interest on external debt (*FDS*). The latter is affected by interest rates in the rest of the world and the exchange rates. Equation 4.22a contents' are the above items of the firm expenditures (*FEXP*).

(4.22*a*) $FEXP = TF + FTF + FTH + FDS + FS$

where TF is $(1 - ftx) FY$. Equations 4.22 and 4.22a are used for determining the firm saving function in Equation 4.33.

Government Accounts

As shown in Chapter II, cautions are needed when reading statements or statistics about the Indonesian economy because of certain terminology used by the government of Indonesia. For example, balanced budget rule is "served" but the GRI uses its own terminology such that it considers itself always having a balanced budget. Its statistics show that, each year, not only it borrows from the public but also uses savings and an excess of planned over actual budget at the end of the fiscal year (in Indonesian: sisa anggaran pembangunan / SAP) to show a balanced budget. In addition, there are also reserves (in Indonesian: cadangan anggaran pembangunan / CAD). The reserves is assumes in this study as a certain amount of foreign currency used only for stabilizing the rupiah (see Appendix A: Table 6). The GRI has four accounts for its expenditures and revenues, those are routine expenditure and routine revenue, development expenditure and development revenue accounts. Appendix A: Table 6 lists items in the accounts and their magnitudes for 1990 to 1995. Among items in the development expenditures are project / investment expenditures (*GINV*) and a fund reserved for stabilization of the rupiah (*RESV*).

The difference between domestic revenue and routine expenditure is recorded as government saving. The GRI uses this saving to finance its planned investment (see explanation for Equation 4.35). When the planned investment budget is larger than its saving, the GRI asked for loans in the CGI meeting and elsewhere as necessary. According to this terminology, the budget is balanced as long as the GRI covers its total expenditures with the external borrowing. Therefore, the budget deficit is actually the GRI's development expenditures minus its saving. Because the GRI's main creditor is the CGI, most of the deficits are represented by magnitude of the new loans from the CGI (IGGI loan). The loans are recorded in the capital account of the Indonesian balance of payments. They actually are also used for covering current account deficits and prevent a depletion of reserves. Foreign capital inflows in terms of private borrowing, direct investment and portfolio investment are other items used to fill the saving-investment gap.

Government Income. The GRI has two separate accounts of its revenues, the government routine and development revenues. However, in order to show the importance of new public loans as one source of development finance such separation is not used in the CGE model for this study. Instead, the revenues are categorized as domestic and total revenues (*GDR* and *GR*).

The government domestic revenue (*GDR*) comes from inter government transfer (*GTG*), direct taxes paid by households and firms, indirect taxes (*TISUM*) and grant from other countries (*ROWTG*). This is reflected in Equation 4.23.

(4.23) $GDR = YKG + GTG + htx\ HY + ftx\ FY + TISUM + ER\ ROWTG$

An important source of government domestic revenue comes from exploration of oil by foreign companies which uses substantial imported inputs and capital. In reality, oil exports

are limited by the quota from OPEC. Oil revenue will be larger with the depreciation of the rupiah or increases in the world price of oil. In this model the oil revenue is assumed to be a part of government capital income (YKG) and considered as a function of national productivity because the world prices are assumed constant. A better model should be able to treat the oil revenue as a function of changes in the exchange rate. Rates of taxes paid by households and firms are represented by *htx* and *ftx*, where *htx* times HY and *ftx* times FY are government direct tax income from households (TH), and from private firms or state enterprises (TF). The GRI has been reforming the tax system since 1984 and introduced the value added tax in 1985. The value added tax has become the GRI's third most important sources of revenues after the revenue from oil and gas and the personal income tax. The GDR will increase with any increases in either the tax rates or households and firms incomes. Equations 4.24 - 26 present components of the total indirect taxes ($TISUM$), those are indirect taxes on domestic, exported and on imported products (TID and TIM).

(4.24) $TID_i = idx_i \, (PD_i \, DS_i + ER \, \overline{PWX_i} \, XSD_i)$

(4.25) $TIM_i = timr_i \, (ER \, \overline{PWM_i} \, MGS_i)$

(4.26) $TISUM = \sum_i \left(TID_i + TIM_i \right)$

where *idx* and *tmr* are sectoral indirect tax rates on domestic and imported commodities respectively. $\overline{PWM}$ and $\overline{PWX}$ are sectoral prices of imported and exported commodities in foreign currency ($).

The government total revenue (GR) is specified as government domestic revenue (GDR) plus public loans ($GDEBT$), see Equation 4.27a.

(4.27*a*) $GR = GDR + GDEBT$

At least 30 percent of the total revenue comes from new loans. The model assumes the GRI continues its prudent macroeconomic policy to only add debt in a certain proportion of its saving and to use the debt for investment in infrastructure (Equation 4.31).

Government Expenditures. The GRI applies the balanced budget rule which means total government expenditures (*GEXP*) must equals its total revenue (*GR*). This equality is presented in Equation 4.27b.

(4.27*b*) $GEXP = GDE + GRE = GR$

The GRI grouped its expenditures into two separate accounts, the government development expenditures (*GDE*) and the government routine expenditures (*GRE*).

The routine expenditures (*GRE*) are supposedly composed by items shown in Equation 4.27c.

(4.27*c*) $GRE = GTH + GTF + GTG + GCONS + ER\ GPRINCPL + WLG + ER\ GDS$

where *GTH* and *GTF* denote total government transfer to households and firms. *GTH* Is mentioned earlier when explaining Equation 4.17. The SAM data indicate that *GTF* is zero. Forty percent or more of the total revenue is allocated for servicing debts (*GPRINCPL* and *GDS*). With any large depreciation of the rupiah the portion for servicing debts will be higher. The government debt services (*GDS*) is a payment for interest on previous government debts. Theoretically, the *GDS* is an endogenous variable, a function of total previous public debts, foreign interest rate as well as the exchange rate. However because data on public debts is not fully known, it is safer and still fit to serve the purpose of this study to assume that magnitude of the *GDS* is exogenously determined and it changes with

any movement in the exchange rates. The interest payment (*GDS*) is an item in the routine expenditures as well as in the current account balance. In the simulation, *GDS* will be smaller when the GRI applies its debt reduction scheme and will increase with a depreciation of the rupiah. Transfer between governments (*GTG*) also shows up in Equation 4.24. Equation 4.27c is then redefined because the SAM does not have data on the salary for government employees (*WLG*) and payment of principal loans (*GPRINCPL*). The payment of principal loans is not shown in the SAM table because it is not considered a current account item. However to represent its magnitudes and importance in determining government investment, *GPRINCPL* will appear latter as a component of government development expenditures (Equation 4.29a). Equation 4.27c is rewritten as:

(4.27) $GRE = GTH + GTF + GTG + GCT + ER\ GDS$

This study assumes that the government total consumption expenditures (*GCT*) is actually a summation of material purchases (*GCONS*) and the government personnel expenditures (*WLG*), see Equation 4.28.

(4.28) $GCT = WLG + GCONS$

Payment to government employees (an operating cost of government represented by *WLG*) is the next largest single item in the routine expenditures after payment on the principal of the debt. In its attempt to reduce spending, the GRI can continue to offer an "early pension" plan to its employees like it did to those in the Telecommunication department, and make operation cost more efficient by combining some of its departments, like it did with the department of industry and trade on December 6, 1995. Such policies will be represented by a cut in *WLG*.

It is assumed that the government has fixed share of sectoral expenditures (S_i^g). The government sectoral expenditures (GC) are shown in Equation 4.29.

(4.29) $PC_i\ GC_i = S_i^g\ GCT$

In the GRI macroeconomics policy, the usage of a certain amount of foreign currency to stabilize the rupiah ($RESV$) is included as a part of its development expenditures (GDE).

(4.29*a*) $GDE = GINV + ER\ GPRINCPL + \sum_i (CHS) + RESV$

Other components of the GDE are government investment expenditures ($GINV$), principal payments on public debt ($GPRINCPL$) and changes in capital stocks (CHS).[5]

It is assumed that the development expenditures equal government development revenues ($GDevR$).

(4.29*b*) $GDE = GDevR$

(4.29*c*) $GDevR = GS + GDEBT$

Equations 4.29a to 4.29c show that the development expenditures (GDE) is financed by the government saving (GS) and external borrowing ($GDEBT$) and that the new loans may be reserved for intervention in the foreign exchange market for supporting the value of the rupiah ($RESV$) and for government investment expenditures ($GINV$).

Government Primary Surplus / Deficit. The non interest or primary surplus / deficit ($PRIMS$) is the gap between the government tax revenue and its total expenditures before paying the interest on public debt. The economy has a primary surplus even if the principal

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[5]The changes in capital stocks is defined as the difference between a summation of rows 8 and 9 with a summation of columns 8 and 9 of the SAM table, see Table 4.2 and Equation 4.29d.

(4.29*d*) $CHS_i = DIN_i + HC_i + GC_i + IT_i + XSD_i - Q_i - MGS_i$

payment is assumed as not yet included in the routine expenditure. Since the GRI balances its saving with external loans for financing its development expenditures, the surplus comes from the difference between tax revenues with the routine expenditure (*GRE*) minus interest payment (*GDS*). This is reflected in Equation 4.30.

(4.30) $PRIMS = htx\ HY + ftx\ FY + TISUM - ER\ GPRINCPL - (GRE - ER\ GDS)$

The government revenues from household and firm income taxes and from transactions of domestic, exported and imported commodities (*TISUM*) are presented earlier in Equations 4.18, 4.22 and 4.26.

Government Debt. It is recorded in other government publications and in most Indonesian media that the GRI received loans from the CGI and some other institutions / countries in 1990, but the loan is not shown in the SAM. The magnitudes of the *ROWSV* is too small for representing total debts made by public and private because it is not much larger than the new debts from the CGI for that year. The CGI's project loans requires rupiah financing, that is for every US$ or Yen borrowed there should be some rupiah available. The availability of the rupiah is shown by the government saving (*GS*). Therefore, the magnitude of the government debt depends on its saving. Proportions of the local and foreign financing can be negotiated. It changed with changes in the capability of the GRI to accumulates saving. It was about 80 percent in the beginning of the IGGI formation, it was approximately 40 to 60 percent since the 1980s. The proportion was higher when the economy was in bad condition. The study assumes that when the economy in debt crisis the GRI will get CGI loans whether it signs agreement with the IMF or not. The study also assumes that the GRI can acquire additional debt at least 70 percent of its saving. Therefore, government debt for the current year (*GDEBT*) is defined as a fixed

proportion of the government saving (GS).

(4.31) $GDEBT = 0.7\ GS$

Saving Functions

In the Indonesian SAM, magnitudes of the savings are not based on the real data but on differences between revenues and expenditures. In the CGE model the household saving is a positive function of disposable income (HYD) and the nominal domestic interest rate (NIR). HYD is discussed previously, see Equation 4.18.

(4.32) $HS = \alpha_1^{hs}\left[HYD\ (1 + NIR)^{\alpha_2^{hs}}\right]$

where α_1^{hs} is elasticity of saving to interest rates and disposable income (household) and α_2^{hs} a constant term in household saving function. Equation 4.32 shows that the HS increases with higher disposable income or higher interest rates.

Corporate saving (FS) is a residual of the firm revenue and expenditures, as shown by Equation 4.33. The equation is derived from Equations 4.22 and 4.22a.

(4.33) $FS = FYD - FTF - FTH - FDS$

The FS is the fund available for investment, it is also called as retained earnings.

Government saving (GS) is actually its current surplus, that is the difference between its total domestic revenue (GDR) and the government routine expenditures (GRE).

(4.34) $GS = GDR - GRE$

GS is the main fund available for government investment expenditures. It can become larger

only when the GRI reduces its non interest routine expenditures (GTH, $GCONS$, WLG) or when the GRI pays less interest payment on its external debts (GDS).

Investment Functions

There are two kinds of sectoral investment, sectoral investment conducted by the private sector (IBF) and sectoral government investment (IBG).

The sectoral government investment (IBG) depends on the magnitude of the government total investment ($GINV$). $GINV$ is defined in Equation 4.35 as an endogenous variable influenced by the magnitude of public saving (GS) and its ability to attract debt ($GDEBT$).

(4.35) $GINV = GS + GDEBT - ER\ GPRINCPL - \sum_i (CHS) - RESV$

Equation 4.35 suggests that with its limited domestic resources, the government can invest more only if it manages to save more or when the government does not spend its resources ($RESV$) for covering the current account deficit. In other words, a reduction in the investment expenditure is more likely to happen when the government does not get enough debts to finance its planned investment or when the rupiah needs to be stabilized. To simplify the matter, this study assumes that the GRI gets loans ($GDEBT$) in a fixed proportion of its saving, see Equations 4.29a to 4.29c for references. The sectoral investment by the government (IBG) is acquired from multiplying an illustrative government sectoral priority S_i^g by sectoral composite prices (PC) and the government total investment (Thorbecke, 1992a, p.232). The relationship is shown in Equation 4.36.

(4.36) $IBG_i = S_i^g \, PC_i \, GINV$

The investment by the firms is a function of gross domestic product (GDP) and the nominal rate of interest (NIR). Formula for the investment by the firms (IBF) is shown in Equation 4.37.

(4.37) $$IBF_i = \alpha_1^{ip} \left[\frac{GDP}{(1 + NIR)} \right]^{\alpha_2^{ip}}$$

where α_1^{ip} is a slope coefficient in gross domestic product (GDP) in investment on domestic product function and α_2^{ip} is a constant term in investment on domestic product function. The gross domestic product (GDP) is defined in Equation 4.37a as a summation of sectoral value added (VA), indirect taxes and trade / transportation margins on domestic and imported commodities(TID and TIM).

(4.37*a*) $GDP_i = VA_i + TID_i + TIM_i$

Therefore, any changes in the price of capital (RK), sectoral wages (WL) or tax treatment and the nominal interest rate (NIR) will cause changes in the investment by the firms (IBF).

Total investment (IT) is defined as a summation of the investment by the firms and by the government (IBF and IBG), see Equation 4.38.

(4.38) $IT_i = IBF_i + IBG_i$

Rest of the World Saving. When the economy is investing more than the resources it has (HS, FS, and GS), it uses some resources that belongs to other countries. Total investment (IT) is defined in Equation 4.38. The foreign resources are referred to as rest of the world saving ($ROWSV$) or the saving investment gap. It is depicted in Equation 4.39.

Equation 4.39 is also known as the saving investment balance.

$$(4.39)\ ROWSV = \sum_i IT_i - \sum (FS + HS + GS)$$

The *ROWSV* is considered as the amount needed to cover the deficit in the current account because the economy is in equilibrium. This closure is shown in Equation 4.39a.

$$(4.39a)\ CAB = FS + HS + GS - \sum_i IT_i$$

Equation 4.39a shows the fact that government policies that affect saving and investment decisions, such as the rates of interest, will influence the magnitude of the *CAB*.

Rest of the World Accounts

The model used for this study acknowledges four components of rest of the world accounts: the trade balance (*TRB*), current account balance (*CAB*), capital account balance (CA) and the official transaction account. The latter is better known as the balance of payments or changes in the official reserves (*BOP*), a summary of the rest of the world accounts.

Trade Balance. Trade balance is a summation of total value of exports and imports. There are two variable names for imported commodities in SAM data, Table 4.2. The first one is for import demand (*MD*), the other is for imported goods and services (*MGS*). *MD* is a summation of all the expenditures on foreign products by different agents, those are imported intermediate inputs (*DMIN*) and consumption of imported products by households (*HCM*) and government (*GCM*), plus the investment with imported commodity (*ITM*). *MD* is located in row 9, column total of the SAM table (Tables 4.1 and 4.2) and is presented in Equation 4.40a.

(4.40*a*) $MD_i = DMIN_i + HCM_i + ITM_i + GCM_i$

MGS is in row 12, column 9 of the SAM table. *MGS* is presented in the model by Equation 4.40 as total value of imported commodities bought from abroad. Equation 4.40 shows that *MGS* is a residual of total values of commodities available for intermediate input (*DIN*), household and government consumption (*HC* and *GC*), investment (*IT*) and exports (*XSD*) minus the values of total commodities produced by the economy (*Q*), changes in the capital stocks (*CHS*) and total indirect tax paid to the government (*TI*).

(4.40) $MGS_i = DIN_i + HC_i + GC_i + IT_i + XSD_i - Q_i - CHS_i - TI_i$

MGS can also be shown as the value of imports without import taxes (*TIM*) and trade / transportation margin on imported commodities (*MTM*) which are involved when delivering them to the customers (4.40b). Equations 4.40b shows that *MGS* is smaller than *MD*.

(4.40*b*) $MGS_i + TIM_i + MTM_i = MD_i$

Export supply is equal to the demand from the rest of the world for Indonesian products because it is assumed that the Indonesian economy is small and open. The export supply is referred to as *XSD* and shown in Equation 4.41. Equation 4.41 shows that the choice between domestic and rest of the world markets is based on the relative prices (*PD* and *PX*) in those markets and transformability in the production as specified by the elasticity of transformation (σ_i^S).

$$(4.41)\ XSD_i = DS_i \left[\left(\frac{1-\delta_i^S}{\delta_i^S} \right) \left(\frac{PX_i}{PD_i} \right) \right]^{-\sigma_i^S}$$

The sectoral elasticity of transformation taken from Lee (1993, p.76) and the transformation

parameter (ρ_i^S) is calibrated sectoral share parameter (see appendix D.2).

Trade balance is total value of exports (XSD) minus total value of imports (MGS). It is shown in Equation 4.42.

(4.42) $TRB = ER \sum_i \left(\overline{PWX_i} XSD_i - \overline{PWM_i} MGS_i \right)$

Current Account Balance. The current account balance (CAB) is actually the trade balance minus factor payment to abroad ($ROWFAC$), and interest payments by the government (GDS) and private debtors (FDS).

(4.43) $CAB = TRB - ROWFAC - ER\ GDS - ER\ FDS$

where $ROWFAC$ is net factor payment to abroad, a difference between payments to factors (capital) to abroad ($YKTROW$) with that from abroad ($YKFROW$). The $ROWFAC$ is shown in Equation 4.44.

(4.44) $ROWFAC = YKTROW - YKFROW$

In the SAM data, ROW receives payments for its capital ($YKTROW$), and from interest on public and private loans (GDS and FDS) and goods and services bought by the Indonesians (MGS). Revenue of the rest of the world ($ROWREV$) is shown in Equation 4.45a.

(4.45*a*) $ROWREV = YKTROW + ER\ GDS + ER\ FDS + \sum_i \overline{PWM_i} MGS_i$

Rest of the world pays for using factors ($YKFROW$) and buying commodities (XSD) from the Indonesian economy. Rest of the world also gives credits ($ROWSV$) and transfers money to the economy ($ROWTR$).

(4.45*b*) $ROWEXP = YKFROW + ROWTR + \sum_i \overline{PWX_i} XSD_i + ROWSV$

The transfers (*ROWTR*) are paid to the households (*ROWTH*), firms (*ROWTF*) and government (*ROWTG*). They are presented in Equation 4.45.

(4.45) *ROWTR = ER (ROWTH + ROWTF + ROWTG)*

Equation 4.45c shows that the rest of the world account is balanced when total revenue receives by the rest of the world (*ROWREV*) equals its expenditures (*ROWEXP*).

(4.45*c*) *ROWREV = ROWEXP*

Capital Account. The capital account is not specifically mentioned in the model. There are four components of the capital account. Those are new loans received by the private sectors (*FDEBT*), new loans made by the Indonesian government (*GDEBT*), rest of the world investment (*ROWINV*) and payments of the principals of previous loans owed by public and private sectors (*PRINCPLT*).

A deficit country needs to amortize their previous debts and to pay the principals (*PRINCPLT*) on the public as well as private loans (*GPRINCPL* and *FPRINCPL*).

(4.46) *PRINCPLT = ER (GPRINCPL + FPRINCPL)*

As a debtor country, Indonesia needs foreign resources (*ROWCLAIM*) to cover the current account deficit (*CAB*) and to pay for the principal of the loans (*PRINCPLT*). *ROWCLAIM* is defined by Equation 4.47.

(4.47) *ROWCLAIM = PRINCPLT - CAB*

Balance of Payments. The model for this study defines balance of payments (*BOP*) the overall deficit / surplus of the economy. Equation 4.48 shows *BOP* as a residual of a combination of new debts made by the government and by the private sectors (*GDEBT* and *FDEBT*) with foreign (direct) investment (*ROWINV*) minus the deficit in the current

account and payments for the principals (*ROWCLAIM*). *FDEBT* is treated as an exogenous variable and *ROWINV* is also an exogenous variable.

(4.48) $BOP = GDEBT + FDEBT + ROWINV - ROWCLAIM$

Equation 4.48 suggests balance of payments deficit / surplus when *BOP* is negative / positive. There are two components in the official reserve: interest and non interest bearing assets. Among the non interest bearing assets are monetary gold, special drawing rights, foreign currencies and export checks. The interest bearing assets are checks, call accounts, time deposit and other notes. For simplicity, it is assumed in the model that all of the assets are non interest bearing. The *BOP* is needed to prevent a depletion of the reserves which can lead to a bankruptcy of the economy. "The country cannot run deficits for ever because it will run out of foreign currencies to be depleted nor can they afford BOP surplus forever..."(Dornbusch and Fisher, 1994, p.166).

Prices

The basic solution strategy used in the model is to reduce the entire model into sets of excess demand equations for factor and product markets. In other words the solution problem is to find a set of equilibrium prices. The prices are determined endogenously and are defined at producers' prices in order to distinguish trade and transportation margins, tariffs, and indirect taxes which are included in the market prices that results in all markets clearing.

Domestic prices. Domestic prices (*PD*) will be the standard for calculating net prices (*PN*), general price index (*GPI*) and composite prices (*PC*). The latter is then used to

calculate equilibrium prices (PQ). The sectoral domestic prices are set as ones in the base run.

Export Prices. The model assumes that Indonesia is an open economy and that the economy is too small to influence the world prices of its commodities. Therefore, the Indonesian economy faces the world prices of exports ($\overline{PWX}$) and imports ($\overline{PWM}$) as given. The GRI charges indirect taxes to domestic outputs whether they are to be sold in the domestic market (DS) or abroad (XSD). idx is the indirect tax rate on those commodities. In addition, delivery of the outputs to the final consumers includes trade and transportation margins for the domestic outputs (MTD). $mtdr$ is the related margin rate on the commodities.[6] The export prices faced by the domestic consumers are shown as PX.

$$(4.49)\ PX_i = \frac{ER\ \overline{PWX_i}}{\left(1 + idx_i + mtdr_i\right)}$$

Equilibrium Prices. The prices that equalize total demand and the availability of the commodities (PQ) are defined in Equation 4.50.

$$(4.50)\ PQ_i = \frac{PC_i\left(DIN_i + HC_i + GC_i + IT_i - CHS_i\right) + PX_i\,XSD_i - PM_i\,MGS_i - TI_i}{Q_i}$$

Net Prices. Net prices (PN) are used for calculating the value added of factors of production, they are unit prices paid to labor and capital after the payment for intermediate inputs.

$$(4.51)\ PN_i = PQ_i - \alpha_i^{DIN}\,PC_i$$

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[6] $(4.49a)\ MTD_i = mtdr_i\,(PD_i\,DS_i + ER\,\overline{PWX_i}\,XSD_i)$

Import Prices. The GRI charges indirect taxes on imported commodities and delivery of the commodities involves trade and transportation margins for the imported outputs (MTM). $timr$ and $mtmr$ are the respective rates of the import tariff and trade / transportation margin.[7] The prices faced by the consumers (PM) are the world prices of imported commodities times effective rate of exchange rates (ERE), see Equations 4.52 and 4.52b. (4.52) $PM_i = ER\,\overline{PWM_i}\left(1 + timr_i + mtmr_i\right)$

The effective exchange rate is "the price of foreign currency inclusive of all taxes imposed on its purchases" (Dervis, de Melo, Robinson, 1982, p.195).

(4.52*b*) $ERE_i = ER\left(1 + timr_i + mtmr_i\right)$

Price of Capital Goods / Services. The price of capital goods / services (PK) depends on sectoral investment by origin (IT) and the composite prices (PC).

(4.53) $PK = \sum_i \left(IT_i / \sum_i IT_i \right) PC_i$

Price of Composite Goods / Services. Composite goods and services (QC) are defined as domestic and imported commodities (4.54a). Their prices are simply derived from a division of their values with their quantities (4.54b).

(4.54*a*) $QC_i = DS_i + MGS_i$

(4.54*b*) $PC_i = \dfrac{\left(PD_i\,DS_i + PM_i\,MGS_i\right)}{QC_i}$

In the program PC is multiplied with degrees of freedom (df) to equate the numbers of equations in the model with its related degrees of freedom so that solutions can be found.

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[7] (4.52*a*) $MTM_i = mtmr_i\,(ER\,\overline{PWM_i}\,MGS_i)$

$$(4.54)\ (df)\ PC_i = \frac{\left(PD_i DS_i + PM_i MGS_i\right)}{QC_i}$$

Monetary Sector

The monetary sector is included as an attempt to capture a simple interaction between money and the real sphere of the economy. According to Dervis, de Melo and Robinson:

> An addition of monetary behavior equations to the model has a great advantage of extending the field of application of the CGE models from the analysis of problems of industrial strategy protection, and trade policy to problems of inflation, "Keynesian" imbalances between aggregate supply and demand, and short-run stabilization policy" (1982, p.151).

In this model we assume that real balance which is defined as money demand divided by the general price index (*MOD / GPI*). The demand increases with higher gross national product (*GNP*) and decreases with higher nominal interest rate (*NIR*). The relationship is shown in Equation 4.55.

$$(4.55)\ \frac{MOD}{gpi} = mm\left[\left(\frac{GNP}{GPI}\right)^{\alpha_1^{MOD}} EXP^{\alpha_2^{MOD} NIR}\right]$$

The respective magnitudes elasticities of real money balances to real income and to interest rate (α_1^{MOD} and α_2^{MOD}) are 1.2711 and (-) 0.005575. The magnitude of real money balance multiplier (*mm*) is acquired from a calibration (0.0043481051). *EXP* is 2.7182818.

The monetary approach to the balance of payment suggested that total external deficit, which is sometimes referred as fiscal deficit (*dNFA*), is financed by changes in the high-powered money (*dHPM*) and changes in total claims on public sector, private enterprises and individuals (domestic credit creation / *dDC*). In the model, *dNFA* is

represented by balance of payments (BOP) while dDC is exogenously determined. The relationship is shown in Equation 4.56a.

(4.56*a*) $dNFA = BOP = dHPM - dDC$

dDC is the change in the central bank's extension of domestic credit (Dornbusch and Fischer, 1994, p.615). For the base run data, the magnitude of dDC is simply taken from 1989-1990 consolidated balance sheet of monetary system (BPS, 1991, p.350). As a way of representing an increasing or decreasing growth of domestic credit creation, the model changes dDC value higher or lower. The change in high power money ($dHPM$) is additional money supplied for the current year. It is shown in Equation 4.56b.

(4.56*b*) $dHPM = MOS - MOSlag$

where MOS is money supply for the year and $MOSlag$ is money supply from the previous year. From Equations 4.56a and b, the money supply is then represented as a function of changes in the domestic credit creation (dDC) and last year money supply, see Equation 4.56.

(4.56) $MOS = MSlag + dDC - BOP$

In the equilibrium, the supply should be equal to its demand. This equilibrium is shown in Equation 4.57.

(4.57) $MOD = MOS$

Rates of Inflation, Exchange and Interest

The domestic inflation rate is defined as a percentage changes in the general price index (*GPI*). The definition for domestic inflation rate (*DOMINF*) is presented in Equation 4.58.

$$(4.58)\ DOMINF = \frac{(GPI - GPIlag)}{GPIlag}$$

The formula for the *GPI* is presented in Equation 4.6 and the *GPIlag* is assumed as one.

As a standard in the literature of the theory of trade, the exchange rate is defined as the price of U.S. dollar in rupiah (how many rupiah to get one U.S. dollar).[8] The study assumes a fixed exchange rate economy because it is not possible to consider a "foreign exchange gap" or a "binding" foreign exchange constraint in a flexible exchange-rate model (Dervis, de Melo, Robinson, 1982, p.288). In the flexible exchange rate model foreign exchange always equals its supply. This study recognizes that in the Indonesian economy a foreign exchange shortage becomes an "almost absolute constraint on growth in the sense that even if domestic savings were available in sufficient amounts to allow an increase in investment, the absence of the required complementary foreign exchange makes such an increase impossible" (Dervis, de Melo, Robinson, 1982, p.288).

The alleged foreign exchange gap is reflecting an overvalued exchange rate, in other words the rupiah is actually over valued in the base run. The exchange rate at the base run, *ER*(0), is indexed as one. It is assumed that the rupiah is expected to depreciate by 15

[8]In the standard IMF practice, the exchange rate is defined as the dollar price of local currency (Dervis, de Melo, Robinson, 1982, p.184).

percent (expected depreciation of the rupiah = $dER0 = 0.15$). The expected change in the price of importables $d\overline{PWM}$ is zero in the base run. The model will accommodate any changes in both expectations. However, the price of importables is assumed constant during model simulations. When there is a devaluation the expected rate of depreciation ($EdER$) will decrease, see Equations 4.59a to 4.59b.[9]

(4.59*a*) $dER = \alpha_1 (ER - 1.0)$

where $\alpha_1 = 1$, therefore, Equation 4.59a is rewritten as Equation 4.59.

(4.59) $dER = ER - 1.0$

(4.59*b*) $EdER = dER0 - dER$

It is assumed that the market for currency is not a perfect market because the GRI often intervenes directly or indirectly to influence the price of rupiah. Therefore, the model is based on the relative purchasing power parity where the world price of importables ($d\overline{PWM}$) and expected rate of depreciation of the nominal exchange rate (dER) have effects on domestic interest rate. The influence goes through expected rate of depreciation of the real exchange rate ($dRER$) that is the expected rate of real exchange rate minus the current real exchange rate. The decreases / increases in the world price of importable ($d\overline{PWM}$ = dPWMbar) is then added to the present price of importable to form the expected changes in the real exchange rate ($dRER$), see Equations 4.60a and 4.60.

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[9]It is possible that the relationship between a devaluation and the expected rate of depreciation represented by α_1 is negative. That happens when government's credibility is low or when the devaluation is read by the public as a sign of the government's failure to defend its currency, therefore, stimulates more depreciation. However in this study the credibility is not a problem and α_1 is simply assumed as one.

(4.60*a*) $dRER = \alpha_2 (d\,\overline{PWM_i}) + \alpha_3 (dER0 - dER)$

where α_2 and α_3 are assumed as ones for simplicity.

(4.60) $dRER = d\,\overline{PWM_i} + (dER0 - dER)$

According to the relative version of purchasing power parity, domestic real interest rate equals to the world rate of interest (*RIRF*) plus inflation from rest of the world and changes in the world price of importable. Assuming that the capital market is perfectly open, the domestic real interest rate (*RIR*) is foreign interest rate (*RIRF*) plus expected changes in the exchange rate (4.61a).

(4.61*a*) $RIR = RIRF + dRER$

The nominal interest rate (*NIR*) is formed as a summation of the world interest rate (*RIRF*) with imported inflation (*dRER*), domestic inflation rates (*DOMINF*) and adjusting nominal interest rate (*NIR0*). The adjusting nominal interest rate (*NIR0*) is a discount rate from the central bank to other banks. *NIR0* is zero at the base run. The GRI can set *NIR0* to a certain positive or negative number.

(4.61) $NIR = RIRF + dRER + DOMINF + NIR0$

Therefore, when the rupiah is over valued, an expectation of depreciation formed and as long as the rupiah is not devalued the domestic real rate of interest will have to increase by the percentage of *dRER*. The *NIR* decreases when expected rate of depreciation diminishes (as actual devaluation takes place). In addition, the GRI can increase the nominal rate as part of its monetary policy. The governor of the Bank of Indonesia sets *NIR0* to a certain positive number to make the interest rate significantly higher than the inflation rate to prevent

capital flight or it sets *NIR0* to a certain negative number when the Bank wants the interest rate lower in order to encourage growth.

GNP and Growth

Gross national product (*GNP*) is defined as a summation of labor and capitalist incomes, those are their value added (*VAL* and *VAK*) plus indirect taxes (*TID* and *TIM*) after net factor payment to abroad (*ROWFAC*). The payment abroad is showed earlier in Equation 4.44.

$$(4.62)\ GNP = \sum_i \left(VAL_i + VAK_i + TID_i + TIM_i \right) - ROWFAC$$

The performance of the economy can be measured by the level of growth of the *GNP*, which is measured as a percentage changes in the *GNP*.

$$(4.63)\ GROWTH = 100\ \frac{(GNP - GNPlag)}{GNPlag}$$

Calibration

Calibration plays an important role in building the model. Most of the parameters in the model is calibrated with the exception of the elasticity of substitution and elasticity of transformation which are taken from Lee (1993, p.76).

The following is step by step (b to f) calibration of the Cobb-Douglas production function to get the contribution of labor (α_i^L) and to determine the sectoral demand of labor (*LD*). The steps are shown by Equations 4.14b to 4.14f, where Π is the profit function

which firms are assumed to maximize.

$$(4.14b)\ \Pi = PN_i\, Q_i - WL_i\, LD_i - RK_i\, KD_i$$

$$(4.14c)\ \frac{\delta Q_i}{\delta LD_i} = \frac{WL_i}{PN_i} = MPL_i$$

$$(4.14d)\ MPL_i\, LD_i = \frac{WL_i}{PN_i} LD_i = \alpha_i^L\, Q_i$$

$$(4.14e)\ \alpha_i^L = \frac{WL_i\, LD_i}{PN_i\, Q_i}$$

$$(4.14f)\ LD_i = \frac{\alpha_i^L\, PN_i\, Q_i}{WL_i}$$

The calibration forms for the CES and CET functions are the same. Both functions have constant elasticity of substitution / transformation that are exogenously determined. The CES functions are used in Equations 4.1, 4.3, and 4.5. The CET function is used in the export supply function (in Equation 4.41).

$$(4.41a)\ Q_i = \varphi_i^S \left[\delta_i^S XSD_i^{\rho_i^S} + \left(1-\delta_i^S\right) DS_i^{\rho_i^S} \right]^{-1/\rho_i^S}$$

$$\sigma_i^S = \frac{1}{\rho_i^S - 1}$$

where Q_i = output sector i

φ_i^S = output efficiency parameter $\varphi_i^S > 0$

δ_i^S = the share parameter $0 < \delta_i^S < 1$

XSD_i = supply of sector i for export

DS_i = supply of sector i for domestic sales

σ_i^S = elasticity of transformation

ρ_i^S = the transformation parameter $(-1 < \rho_i^S \neq 0)$

Based on cost minimization:

Minimize $PX_i\, XSD_i + PD_i\, DS_i$

Subject to $Q_i = \varphi_i^S \left[\delta_i^S XSD_i^{\rho_i^S} + \left(1-\delta_i^S\right) DS_i^{\rho_i^S} \right]^{-1/\rho_i^S}$

where PX_i = the prices of exported commodities in domestic currency

PD_i = the prices of domestic commodities

Solving the first order condition yields:

$$(4.41b)\ \frac{DS_i}{XSD_i} = \left[\left(\frac{1-\delta_i^S}{\delta_i^S} \right) \left(\frac{PX_i}{PD_i} \right) \right]^{-\sigma_i^S}$$

Equation 4.41b shows that the proportion of outputs sold in domestic market to those sold in the rest of the world market is determined by the relative prices in those markets and transformability in the production as specified by the elasticity of transformation. Using the initial values for XSD, DS, PD, PX, and the exogenous values of the elasticity of transformation (or substitution, in the case of CES function), the value of the share parameter (δ_i^S) can be obtained. The above equations are rearranged into Equation 4.41c.

$$(4.41c)\ \frac{1-\delta_i^S}{\delta_i^S} = \left[\left(\frac{PX_i}{PD_i} \right) \left(\frac{DS_i}{XSD_i} \right) \right]^{1/\sigma_i^S}$$

In turn Equation 4.41c is utilized to calculate the shift parameter (φ_i^S) as shown by Equations 4.41d to 4.41g..

$$(4.41d)\ \rho_i^S = 1 - 1/\sigma_i^S$$

$$(4.41e)\ \delta_{1i}^S = \left(DS_i / XSD_i \right)^{\left(1-\rho^S\right)} \left(PD_i / PX_i \right)$$

$$(4.41f)\ \delta_i^S = 1 / \left(1 + \delta_{1i}^S\right)$$

$$(4.41g)\ \varphi_i^S = Q_i / \left[\delta_i^S XSD_i^{\rho^S} + \left(1-\delta_i^S\right) DS_i^{\rho^S} \right]^{1/\rho^S}$$

Model Solution

The final steps in building the CGE model are to load data and translate the equations into a computer language. The benchmark year for the study for the simulations is 1990 and this study uses the Non Linear System (NLSYS) from GAUSS as the main software to solve the equations simultaneously. A solution from the model is shown in Table 4.4. It is shown in Table 4.4. that model solution precisely replicates the base run condition. With such a precision, the calibration in the model is likely to be correct and the model itself is valid and should be ready for some simulations.

TABLE 4.4.

MODEL SOLUTION FOR SELECTED ENDOGENOUS VARIABLES
(Rp BILLION)

SECTORAL DOMESTIC OUTPUT = Q	Base SAM	CGE Solution
Sector		
1Farm food crops	28510.70	28510.696
2Non food farm crops	7281.43	7281.4355
3Livestock	8828.30	8828.3014
4Forestry and hunting	3474.37	3474.3741
5Fishery	4689.78	4689.775
6Non metallic mineral	25310.14	25310.149
7Other mineral	3065.43	3065.4302
8Food, beverages and tobacco	35298.07	35298.049
9Textile, apparel and leather	47156.23	47156.235
10Wood and wood products, and construction	13984.44	13984.435
11Paper product	20962.82	20962.821
12Chemicals, chemical products, petroleum refinery and basic metal	40365.52	40365.504
13Electricity, gas and water supply	4487.62	4487.6318
14Wholesale and retail trade, transportation support and storage	30874.61	30874.611
15Restaurant	12028.01	12027.991
16Lodging	2146.18	2146.1817
17Land transport	11017.22	11017.223
18Water, air transport, and communication	8892.87	8892.8794
19Bank and Insurance	11420.34	11420.341
20Real estate and services	9476.41	9476.417
21Administration, defense, education, health, social services, film and recreation	18347.00	18346.948
22Personal and household services	11497.83	11497.742
T O T A L	359115.32	359115.32

TABLE 4.4 (Continued)

SECTORAL TOTAL INVESTMENT = IT	Base SAM	CGE Solution
Sector		
1Farm food crops	186.45	186.45
2Non food farm crops	180.15	180.15
3Livestock	57.85	57.85
4Forestry and hunting	17.16	17.16
5Fishery	- 24.35	- 24.3499
6Non metallic mineral	2792.50	2792.50
7Other mineral	51.70	51.70
8Food, beverages and tobacco	-5.5999	-5.5999
9Textile, apparel and leather	35806.04	35806.044
10Wood and wood products, and construction	153.07	153.07
11Paper product	22917.45	22917.453
12Chemicals, chemical products, petroleum refinery and basic metal	1553.69	1553.6902
13-21Electricity and others	0.00	0.00
22Personal and household services	1103.84	1103.8373
T O T A L	64789.9501	64789.9547
SECTORAL EXPORTS = XSD	Base SAM	CGE Solution
Sector		
1Farm food crops	222.95	222.9499
2Non food farm crops	1085.52	1085.5167
3Livestock	32.23	32.2299
4Forestry and hunting	91.26	91.26
5Fishery	344.61	344.61
6Non metallic mineral	13269.84	13269.846
7Other mineral	79.94	79.94
8Food, beverages and tobacco	4064.89	4064.8901

TABLE 4.4 (Continued)

SECTORAL EXPORTS = XSD	Base SAM	CGE Solution
Sector		
9Textile, apparel and leather	6621.42	6621.42
10Wood and wood products, and construction	5968.68	5968.6801
11Paper product	1931.60	1931.60
12Chemicals, chemical products, petroleum refinery and basic metal	15175.12	15175.113
13Electricity, gas and water supply	0	0
14Wholesale and retail trade, transportation support and storage	221.59	221.5899
15Restaurant	530.49	530.49
16Lodging	580.49	580.4894
17Land transport	15.37	15.37
18Water, air transport, and communication	872.05	872.0483
19Bank and Insurance	1818.82	1818.82
20Real estate and services	38.59	38.5899
21Administration, defense, education, health, social services, film and recreation	269.63	269.6307
22Personal and household services	53.56	53.5643
T O T A L	38242.24	38242.2357
SECTORAL IMPORTS = MGS	Base SAM	CGE Solution
Sector		
1Farm food crops	632.82	632.8197
2Non food farm crops	105.53	105.5296
3Livestock	60.02	60.0199
4Forestry and hunting	31.50	31.50
5Fishery	1.77	1.77
6Non metallic mineral	2259.60	2259.60
7Other mineral	307.65	307.6501
8Food, beverages and tobacco	1302.65	1302.65

TABLE 4.4 (Continued)

SECTORAL IMPORTS = MGS	Base SAM	CGE Solution
Sector		
9Textile, apparel and leather	37.77	37.77
10Wood and wood products, and construction	2599.68	2599.68
11Paper product	23330.13	23330.13
12Chemicals, chemical products, petroleum refinery and basic metal	12317.40	12317.394
13Electricity, gas and water supply	0.02	0.02
14Wholesale and retail trade, transportation support and storage	261.62	261.6199
15Restaurant	367.31	367.3104
16Lodging	592.08	592.0794
17Land transport	120.9	120.9
18Water, air transport, and communication	1010.05	1010.048
19Bank and Insurance	980.22	980.2199
20Real estate and services	1175.31	1175.3091
21Administration, defense, education, health, social services, film and recreation	1587.09	1587.0943
22Personal and household services	964.61	964.6889
T O T A L	49214.09	49214.164
SECTORAL GOVERNMENT CONSUMPTION = GC	Base run	CGE Solution
Sector		
1Farm food crops	0.00	0.00
2Non food farm crops	21.03	21.03
3Livestock	0.31	0.3094
4-8Forestry and others	0.00	0.00
9Textile, apparel and leather	588.44	588.4414
10Wood and wood products, and construction	87.65	87.6525
11Paper product	812.082	812.0817
12Chemicals, chemical products, petroleum refinery and basic metal	528.299	528.299

TABLE 4.4 (Continued)

SECTORAL GOVERNMENT CONSUMPTION = GC	Base SAM	CGE Solution
Sector		
13Electricity, gas and water supply	179.25	179.2498
14Wholesale and retail trade, transportation support and storage	48.64	48.64
15Restaurant	615.60	615.5993
16Lodging	355.48	355.4803
17Land transport	149.58	149.58
18Water, air transport, and communication	512.85	512.8509
19Bank and Insurance	412.59	412.59
20Real estate and services	224.989	224.9897
21Administration, defense, education, health, social services, film and recreation	10174.97	10174.946
22Personal and household services	586.85074	586.8545
T O T A L	15298.61074	15298.5945
SECTORAL HOUSEHOLD CONSUMPTION = HC	Base SAM	CGE Solution
Sector		
1Farm food crops	14867.847	14922.50
2Non food farm crops	1660.2779	1673.37
3Livestock	4977.5468	4986.00
4Forestry and hunting	530.012	532.39
5Fishery	4505.6465	4507.45
6Non metallic mineral	0.00	0.00
7Other mineral	1.3716	1.3716
8Food, beverages and tobacco	32998.595	32998.579
9Textile, apparel and leather	435.3105	435.3104
10Wood and wood products, and construction	5268.22	5268.2236
11Paper product	6165.2943	6165.2991
12Chemicals, chemical products, petroleum refinery and basic metal	6838.934	6838.934

TABLE 4.4 (Continued)

SECTORAL HOUSEHOLD CONSUMPTION = HC	Base SAM	CGE Solution
Sector		
13Electricity, gas and water supply	1361.91	1361.8794
14Wholesale and retail trade, transportation support and storage	185.33	185.33
15Restaurant	10440.26	10440.264
16Lodging	1130.56	1130.5606
17Land transport	3521.81	3521.8029
18Water, air transport, and communication	3577.40	3577.3586
19Bank and Insurance	4705.32	4705.3171
20Real estate and services	6144.348	6144.352
21Administration, defense, education, health, social services, film and recreation	8880.5284	8880.5283
22Personal and household services	6542.6704	6542.7859
T O T A L	124739.1924	124819.5786

CHAPTER V

SIMULATION RESULTS

This chapter presents the results of policy simulations using the CGE model. There are three parts of the chapter. The first part introduces variables defined as targets or instruments related to the simulated policies. The policies are (1) devaluation of the rupiah, (2) liberalization of trade, (3) austerity, (4) standard reform policy, and (5) strategic reform policy. The second part is divided into five subsections, each of the section reports impacts of a certain policy and discusses the target and instrument variables for the policy. The last part of the chapter provides conclusions regarding the strategic reform policy compared to the standard one.

Target and Instrument Variables

Target Variables

In this study, target variables are defined as variables that are used to measured the effects of a simulated policy. There are eleven (11) target variables: (1) trade balance (TRB), (2) current account balance (CAB), (3) rest of the world's claim (ROWCLAIM), (4) balance of payments (BOP), (5) demand for money (MOD), (6) government primary surplus (PRIMS), (7) government investment (GINV), (8) domestic inflation rates

(DOMINF), (9) nominal interest rates (NIR), (10) unemployment (UNEMP1), and (11) gross national product (GNP).[1] Their magnitudes are shown in Table 5.1 and each of the variables is explained below in order.

Four of the target variables are closely related to each other. First, trade balance (TRB) is total value of exports minus total value of imports. It is affected by domestic prices of export and import commodities which in turn are influenced by the exchange rate (see Equation 4.42 in Chapter IV). The economy has a trade surplus of Rp4,242.92 billion.[2] Second, current account balance (CAB) is the trade balance plus total interest payments from the government and the private sectors (see Equation 4.43). The deficit in the current account is Rp9,026.49 billion. Changes in the current account do not always move in the same direction as changes in the trade balance. For example, a devaluation increases the trade surplus but also increases total interest to be paid on foreign debt. If increases in the interest payment are larger than the increases in the trade surplus then the deficit in the current account increases instead of getting smaller. Third, rest of the world's claim (ROWCLAIM) is the accumulation or total assets owned by the rest of the world for exporting commodities and lending money to Indonesians. The rest of the world's claim is much larger than the deficit in the current account because ROWCLAIM is the deficit in the current account plus total principal payments (see Equation 4.47). Fourth, balance of payments (BOP) is not the same as the magnitude of the current account balance. The payments is a summation of current account balance and capital account, which is the same

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[1]TRB is written as *TRB* in Chapter IV.

[2]The magnitude in the base run does not reflect perfectly the magnitudes stated in Chapter II because data used for the CGE model in this study is Indonesian 1990 SAM.

as the rest of the world's claim plus incoming capital (refer to Equation 4.48). The model assumes incoming capital as well as interest and principal payments are fixed but are influenced by the exchange rate. The rest of the world's claim and the deficit in the balance of payments are presented to show the burden of the economy due to previous debts made by the public as well as by the private sectors. The rest of the world's claim shows dependence of the economy to the rest of the world because the economy is balanced only when the rest of the world's claim is covered by incoming capital from abroad. The rest of the world's claim is 7 times the trade surplus. Such a huge rest of the world's claim indicates also the importance of the Indonesian economy to its trading partners' economies. The Indonesians have to send more than 10 percent of their GNP abroad. The economy can not afford to have a severe recession, with zero or less than four percent growth rate. The study predicts that the other economies whose claims need to be paid will feel the negative effect of the recession experienced by the Indonesian economy.

Demand for money (MOD) is another target variable, especially in the standard policy where the objective is to have a certain growth of money to slow down inflation. Money demand is a positive function of gross national product and the general price index. The model assumes equilibrium exists in the monetary sector so that demand for money equals the supply of money. The latter is derived from supply of money from the previous year plus changes in domestic credit creation (dDC) and the balance of payments (see Equation 4.55). Therefore, the demand for money is expected to increase with increases in domestic credit creation, balance of payment deficits, domestic inflation rates, and gross national product.

Two other target variables are related to government expenditures. These are

government primary surplus (PRIMS) and government investment (GINV). The government primary surplus is a residual of total government routine revenue minus total government expenditures excluding the interest payment (see Equation 4.30). Sources of the routine revenues are direct and indirect taxes, such as income taxes paid by households and firms and indirect taxes on domestic and imported commodities. Among various routine expenditures are government purchases of materials (GCONS) and personnel expenditures (WLG) as well as subsidies for health and education (GTH). It is important to note that the economy has a primary surplus and the formula for determining the primary surplus already covered the principal payment.[3] The government investment is total government revenue available for investment after including new loans as additional source of revenue. The government investment can be seen as a growth opportunity provided by the government. The investment fund falls when the government has to pay a higher principal payment or when the government needs to spend more money (RESV) to sterilize the economy (see Equation 4.35). The sterilization cost is larger when there is larger incoming capital, which in this model is assumed to be constant.

Two other target variables are the domestic inflation rate (DOMINF) and the nominal interest rate (NIR). In Equation 4.58 domestic inflation rate is defined as percentage changes in the general price index, while the nominal interest rate is defined in Equation 4.61. as nominal foreign interest rate plus domestic inflation and adjusting nominal interest rate (NIR0).

The rest of the target variables are the number of unemployment (UNEMP1) and

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[3]It is important because usually the standard policy is suggested for countries with primary deficit.

gross national product (GNP). The unemployment is a different between total supply with total demand of labor (Equation 4.10). The gross national product is a summation of total value added and total indirect taxes. The number of unemployment and gross national product are likely to go in an opposite direction. An increase in the gross national product may come from more usage of labor and capital or more activity which can be taxed (see Equation 4.62). Another variable that influences the gross national product is factor payment to abroad which increases with an increased exchange rate.

Instrument Variables

Instrument variables are controllable variables that are used for influencing the target variables. The variables are controllable because their magnitudes are determined by the policy maker (government). There are eleven instrument variables: (1) government purchases of materials (GCONS), (2) government subsidy for health and education (GTH), (3) government personnel expenditures (WLG), (4) government interest payment / debt services (GDS), (5 and 6) tax rates on household income and on firm income (htx and ftx), (7 and 8) sectoral indirect tax rates on domestic and on imported commodities (idx and timr), (9) adjusting nominal interest rates (NIR0), (10) exchange rate (ER), and (11) changes in credit creation (dDC). Some instruments such as the exchange rate and indirect tax rates have direct or indirect impacts on most of the target variables, while others only have impacts on a few targets. One of the policy simulated (devaluation of the rupiah) uses only one instrument while the other four policies use two or more of the instruments. The magnitudes of the instrument variables are shown in Table 5.1. Each of the instruments will

be explained below.

Four of the instruments are components of government expenditures, those are government purchases of materials, government subsidies for health and education, government personnel expenditures (salary and wages for government employees), and government interest payment. These four variables have direct negative impacts on the government primary surplus / deficit (PRIMS) and on the government investment expenditures (GINV). Reduction of government interest payment is only implemented in the strategic policy when the government prefers to reduce the payment instead of taking larger loans with higher obligations because the economy faces the crisis.

Four other instrument variables have positive relationships with government income. These are tax rates on household and firm income (htx and ftx), sectoral indirect tax rate on domestic commodities (idx), and sectoral indirect tax rate on imported commodities (timr). Increases in household and firm income tax rates (htx and ftx) are actualized in the austerity and standard policies to compensate reduction in government revenue after the government decreases indirect tax rates on domestic and imported commodities in its attempt to liberalize the economy. In the strategic policy, the government does not increase the tax rates when the economy faces recession. The government helps the economy with its strategic policy to avoid prolonged recession so that it can expects larger tax incomes from more survived firms.

The adjusting nominal interest rate (NIR0) is set by the government in order to influence capital flows. The adjusting rate affects the nominal interest rate for saving and investment. In a crisis or pre crisis situation the IMF usually asks the debtor country to increase the nominal interest rate in order to prevent large capital flight out of the country

and to prevent further depreciation of its currency.[4] In this study NIR0 is set as zero at the base run. It is changed to positive 0.02 percent in the standard policy and to negative 0.02 percent in the strategic policy. The 0.02 percent is used because the study assumes the next crisis happens when the rupiah devalues by at least 25 percent and there will be at least 0.5 percent additional reduction or increases in the nominal interest rate for every 25 percent devaluation of the rupiah. The strategic policy is based on the assumption that high interest rate can not prevent capital outflow but it will only endanger the survival of many of previously healthy firms. The death of those firms will cause heavy unemployment and will need strong government sector to lead the economy later on. Those two conditions are to be avoided especially since it is not possible to expect a strong government when its maneuver ability is already weakened by its external debt obligation.

The other two instruments are the changes in domestic credit creation (dDC) and exchange rate (ER). In the base run, the domestic credit is reduced by Rp2,570 billion from its previous magnitude, therefore, an increase of credit (monetary expansion) is represented with smaller number following the negative sign (-2,560). As mentioned earlier, the ER has impacts on most of the target variables because it affects sectoral domestic prices of imported and exported commodities, on the magnitudes of interest and principal payments with their related impacts on the external accounts (trade and current account balances, rest

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[4]A recent example of the usage of the significantly higher than inflation nominal interest rate is in the present debt crisis experiencing by the Indonesian economy. During March - July 1998, nominal interest rate in Indonesia was set around 55 percent and the highest rate reached was 67 percent. Such a high rate made a huge additional public and private banks' debts to domestic savers and prevented potential invertors from taking new loans. Even if such a high rate could prevent more capital flight, the high interest rate also contributed to more severe recession because more people chose to save than to use their money for productive activity.

of the world's claim and balance of payments), and on factor payment to abroad (ROWFAC). The latter is a component in calculating gross national product.

TABLE 5.1

TARGET AND INSTRUMENT VARIABLES IN THE BASE RUN

Target variable	Reference*	Magnitude	Instrument variable	Magnitude
Trade balance (TRB)	4.42	3,242.92B	Government purchases of materials (GCONS)	7,400.71B
Current account balance (CAB)	4.43	(9,026.49)B	Government subsidy for health and education (GTH)	5,723.37B
Rest of the world's Assets (ROWCLAIM)	4.47	26,447.859B	Government personnel expenditures (WLG)	8,102B
Balance of payments (BOP)	4.48	(6,275)B	Government debt services (GDS)	4,555B
Demand of money (MOD)	4.55	23,819B	Household income tax rate (htx)	1.2%
Primary surplus (PRIMS)	4.30	3,016.972B	Firm income tax rate (ftx)	42%
Government investment (GINV)	4.35	13,791.7B	Sectoral indirect tax rate on domestic commodities (idx)	Appendix E: Table 1
Domestic inflation rate (DOMINF)	4.58	2%	Sectoral indirect tax rate on imported commodities (timr)	Appendix E: Table 1
Nominal interest rate (NIR)	4.61	26%	Adjusting nominal interest rate (NIR0)	0.0
Unemployment (UNEMP1)	4.10	4,579,658.3	Changes in domestic credit creation (dDC)	(2,570)B
Gross natl. product (GNP)	4.62	201,250.619B	Exchange rate (ER)	1.1

Note:
B = Billion Rp.
* = Equation number in Chapter IV

Simulations

The CGE model explained in Chapter fourth is used for conducting five simulations. The simulated policies are (1) devaluation of the rupiah, (2) liberalization of trade, (3) implementation of austerity policy, (4 and 5) standard reform and strategic reform policies. The first simulation shows how certain variable influences the rest of the variables in the model. The other four simulations show impacts of simultaneous changes in some variables to the economy. The impacts are seen by comparing results of one simulation with condition in the base run and with results from simulations of the other policies. Simulations four and five are done with one percent increase in the indexed exchange rate (ER=1.01). The study does not mean to tell that a crisis happens when the rupiah depreciates by one percent. As mentioned earlier, the study assumes when a crisis is fully developed the exchange rate will increase by at least 25 percent. A study by Thorbecke and his team uses ER=1.20 (1982a). However, the ER=1.01 is used to enable us to see more clearly the basic component as well as the basic impacts of each of the policy for every percentage changes in the exchange rate. In other words, we can multiply the changes from the simulations by 25 times to see the impacts of ER=1.25 (with the relevant elasticities).

The following sections discuss the simulation results and various instruments used and targets affected in each of the simulations. The presentation of the policy is helped by a table that shows magnitudes and direction of changes in the target and instrument variables.

Devaluation of the Rupiah

There are four important reasons to simulate a devaluation of the rupiah. First, it is very likely that the rupiah is currently overvalued. Such conclusion is taken from the fact that economy has always been experiencing current account deficits since 1966 (except in three years). Second, as they are preparing their economies to reap benefit from the AFTA, it is possible that the AFTA member countries will devalue their currencies, such as done by the Republic of China in 1994. Third, or more importantly, depreciation will happen naturally whenever there is an external shock to the Indonesian economy. Fourth, devaluing the domestic currency is one of the IMF standard policies. The devaluation is also a component in the strategic reform policy.

We simulate a devaluation by changing exchange rate (ER) from 1.0 in the base run to a higher indexed number. When ER is 1.01 or higher, on one hand imported prices in rupiah (PM) are higher because more rupiahs are needed to get one U.S. dollar, on the other hand exported prices in rupiah (PX) are also higher because exporters acquire more rupiah from the same amount of dollars.[5] It is expected that a devaluation will bring higher surplus in the trade balance because sectoral imports (MGS) are lower while sectoral exports increase. For this study, several simulations are conducted to see impacts of one to five

[5]There are 22 sectors in the model: (1) farm food crops; (2) non farm food crops; (3) livestock; (4) forestry and hunting; (5) fishery; (6) non metallic mineral; (7) other mineral; (8) food beverages and tobacco; (9) textile, apparel and leather; (10) wood and wood products, and construction; (11) paper product; (12) chemicals, chemical products, petroleum refinery, and basic metal; (13) electricity, gas and water supply; (14) wholesale and retail trade, transportation support and storage; (15) restaurant; (16) lodging; (17) land transport; (18) water, air transport, and communication; (19) bank and insurance; (20) real estate and household service; (21) administration, defense, education, health, social services, film and recreation; (22) personal and household services.

percent devaluation (ER=1.01 to ER=1.05). Results from simulating five percent devaluation are presented in Table 5.2. Details of the results are discussed below.

As expected effect of the devaluation on trade balance is positive. Table 5.2 shows that the devaluation increases trade surplus significantly (71.3 percent) and decreases current account deficit by 21 percent. Devaluation also has an impact that changes the sectoral demand of commodities from abroad as well as the sectoral supply of commodities to abroad. The changes are presented in Appendix E: Table 2.

The devaluation has positive effects on inflation (DOMINF). The inflation rate increased by 39 percent. Increased inflation rate happens when there are positive changes in the general price index (GPI). Increased price index is caused by raising sectoral prices of composite goods / services (PC). The chain effects can be summarized in two steps. First, equilibrium prices increased because post devaluation's increases in sectoral exports (XSD) and sectoral export prices in rupiah (PX) are higher than the increase in sectoral rupiah import prices (PM) times the sectoral imports of goods and services, and because the new sectoral output production (Q) is lower.[6] Second, sectoral composite prices (PC) increases because the summation of the value of domestic sales with the value of imported commodities divided by the new amount of the composites (DS + MGS) is higher. That happens because lower sectoral imports of goods and services reduces sectoral domestic sales (DS) which, therefore, reduces the sectoral composite goods / services, but increased sectoral import prices increases the ratio of outputs sold in the domestic market to goods and

[6]Lower sectoral demand for labor causes lower sectoral production, see explanation of the impacts of devaluation on employment level.

services imported.[7]

Another effect of the devaluation is on employment level (UNEMPL1). It increased by 31.1 percent. Higher general prices bring about higher sectoral wages which in turn reduces sectoral demand for labor (LD). However, interestingly, total demand for labor (LDT) is higher. Higher total demand for labor happens because there is a very high increases in the demand for labor for personal and household services (sector 22). This effect deserves special attention because it is found also in the four other simulated devaluation (ER=1.02 to ER=1.05). One possible reason is that with the devaluation of the rupiah domestic sales is very low but there are more people (from the rest of the world) who can afford to buy the services of the Indonesians in the personal and household sector.

Other effects of the devaluation are decreases in government revenue and primary surplus because changes in additional indirect tax revenue from more export activity is less than the contraction of import tax revenue (TIM) following lower sectoral imports. As a consequence, the government has less ability to acquire new debts and finance its planned investment. The government primary surplus (PRIMS) and investment (GINV) decreased by 34.9 and 10.2 percent correspondingly.

The above results can be seen in Table 5.2. In shorts, results shown in the table indicate that a devaluation will improve the external and internal balances. However, as shown by a higher domestic inflation rate (DOMINF) in Table 5.2, the devaluation also brings about an increased inflation rate. The balance of payments, current account and trade

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[7]The ratio of sectoral domestic sales / sectoral imports of commodities (DS / MGS) increases with increased sectoral import prices (PM), see Equation 4.3. Decreased MGS times increased prices of imported commodities (PM) plus multiplication of prices of domestic commodities (PD) and DS causes sectoral prices of composite goods / services (PC) to increase (Equation 4.54b).

balance in the base run (BR) and after a devaluation (Dev5) are contrasted in Figure 5.1.

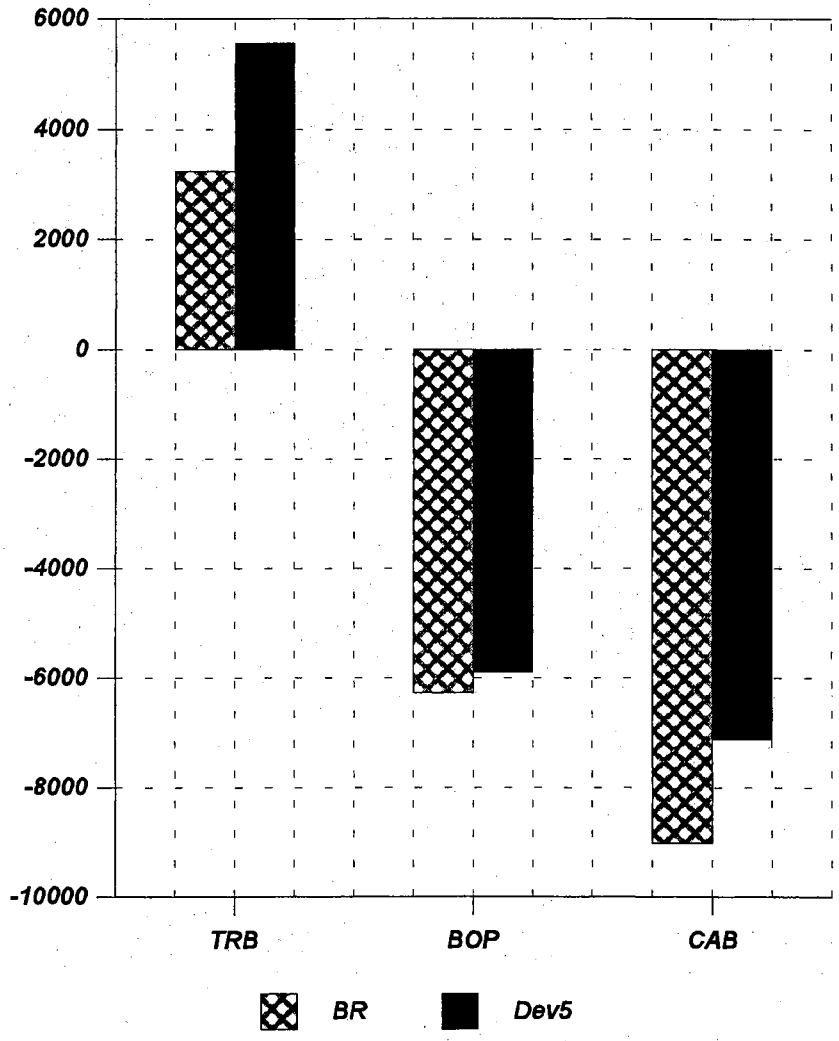

Figure 5.1. Balance of Payments, Current Account and Trade Balances in the Base Run and After the Devaluation

TABLE 5.2

RESULTS OF A FIVE PERCENT DEVALUATION OF THE RUPIAH

Target variable	New magnitude (% change)	Direction of change	Instrument variable	New magnitude	Direction of change
Trade balance (TRB)	5,555.61B (71.3)	Increase	Government purchases of materials (GCONS)	NON	Constant
Current account balance (CAB)	(7,127.06)B (21)	Decrease	Government subsidy for health and education (GTH)	NON	Constant
Rest of the world's Assets (ROWCLAIM)	2,5419.49B (3.9)	Decrease	Government personnel expenditures (WLG)	NON	Constant
Balance of payments (BOP)	(5,907.54)B (5.9)	Decrease	Government debt services (GDS)	NON	Constant
Demand of money (MOD)	23,451.54B (1.5)	Decrease	Household income tax rate (htx)	NON	Constant
Primary surplus (PRIMS)	1,963.76B (34.9)	Decrease	Firm income tax rate (ftx)	NON	Constant
Government investment (GINV)	12,380.72B (10.2)	Decrease	Sectoral indirect tax rate on domestic commodities (idx)	NON	Constant
Domestic inflation rate (DOMINF)	2.78% (39)	Increase	Sectoral indirect tax rate on imported commodities (timr)	NON	Constant
Nominal interest rate (NIR)	21.78% (16.2)	Decrease	Adjusting nominal interest rate (NIR0)	NON	Constant
Unemployment (UNEMP1)	3,156,360.8 (31.1)	Decrease	Changes in domestic credit creation (dDC)	NON	Constant
Gross natl. product (GNP)	199,093.14B (1.1)	Increase	Exchange rate (ER)	1.05	Increase

Note: B = Billion Rp. NON = the magnitude is the same like it is in the base run (no changes)

Liberalization of Trade

It is important to simulate a liberalization of the economy because as an AFTA member the government of Indonesia has to follow the AFTA's liberalization schedules, and because liberalization is another basic component of the standard reform policy.

Instruments for the liberalization policy are indirect tax rates on domestic and imported commodities (idx and timr). Based on the SAM data, import tax rates are very low. Most of them are even less than 1 percent and they are lower than the rates suggested by the AFTA schedules, see Appendix E: Table 1. In the simulation, the initial rate are brought even lower to see the impact of such changes on the government budget. The new rates are presented in Appendix E: Table 1. With the liberalization, 10 sectors are completely liberalized and only 5 other sectors have import tax rates higher than 2 percent. Those sectors are farm food crops (2.5 percent), textile (3.5 percent), wood and wood product (8.7 percent), paper product (9.4 percent) and chemical sectors (4.67 percent). Appendix E: Table 1 presents the tax rates after and before the liberalization. The effects of the liberalization are presented in Table 5.3.

Liberalization of trade has a direct effect on government domestic revenue (GDR). The revenue is composed of direct and indirect tax incomes. The indirect tax revenue will decrease when the government reduces the indirect ax rates and there is no compensating increases in the taxable amounts of goods / services. Since the government receives less income from liberalizing trade, there is fewer resources for its primary surplus (PRIMS). The government investment (GINV) is lower than it is the base run.

Liberalization of trade has direct effects on export and import prices in rupiah (PX

and PM). The sectoral export prices (PX) are supposed to be higher while the sectoral import prices (PM) are supposed to be lower with less indirect taxes.[8] However, those effects are partly lessened by the fact that those prices are also influenced by trade and transportation margins on the related exported or imported commodities (mtdr or mtmr). As the results, the export prices increase in 14 sectors, stay the same in the other 6 sectors and decrease in the remaining 2 sectors while the import prices are lower only in 10 sectors but stay the same in the other 12 sectors. Since exports are higher and imports are lower in many sectors, the economy has a slightly higher trade surplus (0.03 percent). Ceteris paribus, the increased surplus of the trade balance elevates current account deficit by 0.003 percent and reduces the overall external burden (ROWCLAIM) by 0.001 percent.

Among the indirect effects of the liberalization of trade is an improvement in the employment level (UNEMPL decreases). The effects of liberalization on export and import prices, which are explained earlier, bring mixed consequences on sectoral equilibrium prices (PQ) and on sectoral composite prices (PC). The consequences are higher sectoral equilibrium prices in 11 sectors and higher sectoral composite prices in 12 sectors, but both prices are lower than they were in the base run for the rest of the economy. In short, the new sectoral PC deflates the general price index which then cuts the sectoral wages (WL) and increases the sectoral demand for labor (LD) in 18 sectors.[9] The new sectoral demand for

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[8]From Equations 4.49 and 4.52: $PX_i = ER\,\overline{PWX_i} / (1 + idx_i + mtdr_i)$; and $PM_i = ER\,\overline{PWM_i}\,(1 + timr_i + mtmr_i)$ where PX_i and PM_i are sectoral export and import prices in rupiah; $\overline{PWX_i}$ and $\overline{PWM_i}$ are sectoral world prices of exports in dollar, ER is exchange rate; idx_i and $timr_i$ are indirect tax rates, and $mtdr_i$ and $mtmr_i$ are trade and transportation margins on the related exported and or imported commodities.

[9]The sectoral demand for labor decreases in the following sectors: (1) electricity, gas and water supply; (2) land transport; (3) water, air transport, and communication; and (4)

labor causes higher total demand for labor (LDT).

The deflationary effects of the liberalization which decreases the domestic inflation and nominal interest rates (DOMINF and NIR) do not curtails the demand for money because the liberalization is followed by an increase in gross national product (GNP). The increase in the GNP happens because higher number of employment increased value added (VAL) and because of the additional value added is larger than the reduction in the indirect tax revenue.[10]

Table 5.3 shows that overall the liberalization causes increases in trade surplus, employment, the demand for money, and in the gross national product (GNP). The table also presents decreases in the external burden (ROWCLAIM), inflation and nominal interest rates (DOMINF and NIR). However, percentage changes in those target variables are very small. Changes in the unemployment level (0.24 percent) and in the inflation and nominal interest rates (0.25 and 0.38 percent) are much more significant compared to changes of the other targets.

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bank and insurance. Those sectors are the ones that recently welcome foreign workers the most compared to other sectors in the Indonesian economy.

[10]Gross national product is a summation of the sectoral value added of labor and capital with sectoral indirect taxes on imported and domestic commodities (see Equation 4.62).

TABLE 5.3

RESULTS OF LIBERALIZATION OF TRADE

Target variable	New magnitude (% change)	Direction of change	Instrument variable	New magnitude	Direction of change
Trade balance (TRB)	3,244.04B (0.03)	Increase	Government purchases of materials (GCONS)	NON	Constant
Current account balance (CAB)	(9,026.2)B (0.003)	Decrease	Government subsidy for health and education (GTH)	NON	Constant
Rest of the world's Assets (ROWCLAIM)	26,447.57B (0.001)	Decrease	Government personnel expenditures (WLG)	NON	Constant
Balance of payments (BOP)	(6,276.9)B (0.03)	Increase	Government debt services (GDS)	NON	Constant
Demand of money (MOD)	23,820.9B (0.008)	Increase	Household income tax rate (htx)	NON	Constant
Primary surplus (PRIMS)	3,013.69B (0.1)	Decrease	Firm income tax rate (ftx)	NON	Constant
Government investment (GINV)	13,786.01B (0.04)	Decrease	Sectoral indirect tax rate on domestic commodities (idx)	Appendix E: Table 1.	Decrease
Domestic inflation rate (DOMINF)	1.995% (0.25)	Decrease	Sectoral indirect tax rate on imported commodities (timr)	Appendix E: Table 1.	Decrease
Nominal interest rate (NIR)	25.99% (0.38)	Decrease	Adjusting nominal interest rate (NIR0)	NON	Constant
Unemployment (UNEMP1)	4,568,628.3 (0.24)	Decrease	Changes in domestic credit creation (dDC)	NON	Constant
Gross natl. product (GNP)	201,262.78B (0.006)	Increase	Exchange rate (ER)	NON	Constant

Austerity Policy

An austerity policy which includes fiscal and monetary restraints is designed to improve the current account balance. The austerity policy is the main component of the standard policy.

Instruments for this simulation are government personnel expenditures (WLG), government purchases of material (GCONS), income tax rates (htx and ftx) and changes in domestic credit creation (dDC). The expenditures are reduced and tax rates are increased to alleviate deficits in the current account and government budgets.

Magnitude changes in the instruments for the austerity and standard policies are determined with the following considerations. First, it is assumed that there is going to be 25 percent or more depreciation of the rupiah when the crisis develops. The exchange rate is not an instrument of the standard policy but the changes of the other instruments are assigned for each percentage of the depreciation. Second, Rp10 billion change in the credit emission is based on the statistics published by the GRI which stated there was Rp251 billion change after 1983 devaluation (BPS, 1992, p.365). For convenience, in the study domestic credit creation is changed by Rp10 billion higher than it is in the base run instead of by Rp10.04 billion. Third, changes in the magnitudes of government expenditures are based on the fact that every year the GRI took new debts from the IGGI which at least Rp200 billion larger than the loan taken a year before (BPS, 1995, p.452). In anticipation of the next crisis, it is expected that the new loan will be at least Rp625 billion more than it was the year before the crisis, arbitrarily three times of the usual additional loans for every 25 percent changes in the value of the rupiah. Therefore, total changes in government revenues

and expenditures should be at least Rp25 billion for every percentage changes in the value of the rupiah. Fourth, the Rp25 billion is allocated to various government accounts according to the likely "cut" priority of the IMF. With such priority, the reduction in the government subsidies for health and education (GTH) is larger than the reduction in the government material purchases (GCONS) and in the government personnel expenditures (WLG). The reduction in the expenditures is accompanied by a small percentage increases in household and firm income tax rates.[11] Results of the simulation is shown in Table 5.4.

Table 5.4 shows that with its fiscal and monetary restraints, the government saves more (PRIMS increases) and its ability to create growth (GINV) is higher. The primary surplus and the government total investment increases by 7.82 and 2.94 percent respectively.

Table 5.4 also shows that contrary to what we expected, the austerity policy causes a significantly lower trade surplus and a higher current account deficit than they are in the base run. Changes in those variables (5.89 and 2.3 percent) are slightly smaller when there is no monetary restraint, however they are still in the direction that is not expected. One possible cause of the reduction in the trade surplus is from a combined effects of decreased firms' and household disposable incomes to increased unemployment which then together decreases spending by the private sector. The households and firms have less disposable incomes after the government increases the rates of their income taxes. The unemployment number increased by 3.2 percent. Larger unemployment numbers is partly caused by increases in the composite prices. Thirteen sectors experience higher composite prices which

[11]It is arbitrarily assumes that the increased tax rates will have Rp1 to 2 billion positive impact on government income, therefore, the GRI can plan Rp26 billion expense curtailment (higher public expenditure cut than in the strategic policy).

then have negative impacts on total demand for labor. Therefore, the austerity policies are detrimental to the external and internal balances.

With exchange rate constant changes in the current account, rest of the world's claim and balance of payments are directly related to changes in the trade balance.

TABLE 5.4

RESULTS OF AUSTERITY POLICY

Target variable	New magnitude (% change)	Direction of change	Instrument variable	New magnitude	Direction of change
Trade balance (TRB)	3,052.04B (5.89)	Decrease	Government purchases of materials (GCONS)	7,389B	Decrease
Current account balance (CAB)	(9,234.6)B (2.3)	Increase	Government subsidy for health and education (GTH)	5,710B	Decrease
Rest of the world's Assets (ROWCLAIM)	26,655.96B (0.79)	Increase	Government personnel expenditures (WLG)	8,099B	Decrease
Balance of payments (BOP)	(6,315.86)B (0.65)	Increase	Government debt services (GDS)	NON	Constant
Demand of money (MOD)	23,849.86B (0.13)	Increase	Household income tax rate (htx)	1.3%	Increase
Primary surplus (PRIMS)	3,252.8B (7.82)	Increase	Firm income tax rate (ftx)	42.5%	Increase
Government investment (GINV)	14,197.72B (2.94)	Increase	Sectoral indirect tax rate on domestic commodities (idx)	NON	Constant
Domestic inflation rate (DOMINF)	1.98% (1)	Decrease	Sectoral indirect tax rate on imported commodities (timr)	NON	Constant
Nominal interest rate (NIR)	25.98% (0.08)	Decrease	Adjusting nominal interest rate (NIR0)	0.0	Constant
Unemployment (UNEMP1)	4725,981.1 (3.2)	Increase	Changes in domestic credit creation (dDC)	(2,580)B	Decrease
Gross natl. product (GNP)	201,149.49B (0.05)	Decrease	Exchange rate (ER)	NON	Constant

Standard Policy

The standard policy is basically tightened fiscal and monetary policies to increase more revenue for servicing the debts. It is an austerity policy which is accompanied by devaluation of the rupiah, liberalization of trade and increases in the adjusting nominal interest rate (as well as large borrowing). The standard policy is aimed at decreasing the current account deficit and influencing the decision for saving and investment.

The instruments for the standard policy are the same with those used for the austerity policy with additions of increases in the exchange rate, decreases in the indirect tax rates and increase adjusting nominal interest rate. The formula for nominal interest rate (NIR) in this study allows us to make the NIR significantly higher than inflation rate, that is by changing NIR0 from zero to a number considered relevant. It is assumed that the GRI may increase the nominal interest rate by 0.5 percent for every 25 percentage changes in the rupiah's value to prevent more capital flight.[12] For the standard policy simulations, the adjusting nominal interest rate is changed to 0.02 such that the nominal interest rate increases by 0.5 percent for every 25 percentage changes in the rupiah's value. The standard policy simulated here is only one of some possible combination of various instrument usually used in the IMF standard policy. Changes in magnitudes of the other instruments are assigned the same way as we assigned those assigned for the previous three policies.[13]

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[12]However, as explained in Chapter IV, the study also acknowledges that the initial and considered normal expected rate of depreciation (dER) is 15 percent. Such expectation is shown in the CGE model by differences in the nominal interest rate in Indonesia (NIR) is 24 percent while the real interest rate abroad (RIRF) is 9 percent.

[13]The changes are assigned for every one percentage changes in the exchange rate; are done like they are in the austerity policy; and with a reduction in the indirect tax rates

Results of the standard policy is presented in Table 5.5. Since the standard policy is a combination of the three previous policies - the one percent devaluation of the rupiah, the liberalization of trade and the austerity policies, it is expected that the results of its simulation will reflect combined effects of the three previous policies. Therefore, whenever possible, in order to avoid having unnecessarily complicated explanation, results of the standard policy are explained in certain order. The results carried on from devaluation effects will be presented before we explain those from the liberalization of trade and from the austerity policies. Percentage changes in the target variables are explained later when we compare the results with those from the strategic policy (see Table 5.7).

After the simulation, import and export prices increase in all sectors. Imports of good / services decrease in all but seven sectors while exports increase in seven sectors. These sectors are (1) farm food crops, (2) non farm food crops, (3) livestock, (4) textile, apparel and leather, (5) wood and wood products, (6) construction, and (7) restaurant and real estate and services. The sectoral exports decrease in the other 15 sectors. The total value increase in exports is larger than the total value increases in the imports so that there is higher trade surplus (TRB increase) and less current account deficit (CAB decrease). However, the additional surplus of trade is less than the increases in the principal debt payments from the devaluation so that there are more external burden (ROWCLAIM increase).

Some other results of the standard policy are changes in the prices of composite commodities (PC) and other prices. The composite prices increase in 15 sectors and decrease in the other 7 sectors because of higher prices of imported and exported commodities (PM

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like has been done for the liberalization policy.

and PX). Equilibrium prices (PQ) are higher in 18 sectors but become lower in the other 4 sectors. Net prices (PN) increase in 13 sectors but decrease in the rest. The overall changes in the prices are represented by increases of the general price index.

The higher general price index causes higher inflation and nominal interest rates (DOMINF and NIR increase). As a consequence of raising nominal interest rates, demand for money is lower. The new general price index also increases sectoral wages (WL) in 19 sectors. The other three sectors that experience lower wages are (1) electricity, gas and water supply, (2) lodging, and (3) water, air, and communication.

The simulation also shows more mixed results, among them are decreased sectoral demand of labor in the 13 sectors that experiences increase net prices and increased demand of labor in the rest of the economy. Contrary to our expectation, the unemployed number (UNEMPL1) decreases after such changes in the demand of labor.

The following are results from the liberalization. On one hand, the government has less indirect tax revenue (TISUM) because indirect tax rates on domestic and imported commodities are cut when it liberalizes trade. On the other hand, the government receive more direct tax by increasing direct tax rates (htx and ftx) as other components of the standard policy. The increase in direct tax revenue is smaller than the reduction in the indirect tax revenue, as a result the gross national product (GNP) is lower than it is in the base run.

With its austerity policy, the GRI is spending less and receiving more which then enable it to have more primary surplus (PRIMS increase) so that it can invest more (GINV is higher).

It is important to acknowledge that the simulation results do not show socio-political

consequences of decreased on health and education (GTH) or from increased oil prices (as part of the reduction in GCONS). Decreases in the oil and the other subsidies have direct positive impacts on the rate of inflation after they cause higher general price index. The consequences not reflected in the table are less social entitlement (education, health, food and transportation) for the poor and political unrest because of the overall increases in the general prices.

TABLE 5.5

RESULTS OF THE STANDARD POLICY

Target variable	New magnitude (% change)	Direction of change	Instrument variable	New magnitude	Direction of change
Trade balance (TRB)	3,480.09B (7.31)	Increase	Government purchases of materials (GCONS)	7,389B	Decrease
Current account balance (CAB)	(8,901.57)B (1.38)	Decrease	Government subsidy for health and education (GTH)	5,710B	Decrease
Rest of the world's Assets (ROWCLAIM)	26,497.16B (11.24)	Increase	Government personnel expenditures (WLG)	8,099B	Decrease
Balance of payments (BOP)	(6,277.2)B (3.51)	Increase	Government debt services (GDS)	NON	Constant
Demand of money (MOD)	23,811.2B (0.33)	Decrease	Household income tax rate (htx)	1.3%	Increase
Primary surplus (PRIMS)	3,057.12B (1.33)	Increase	Firm income tax rate (ftx)	42.5%	Increase
Government investment (GINV)	13,945.88B (1.1)	Increase	Sectoral indirect tax rate on domestic commodities (idx)	Appendix E: Table 1	Decrease
Domestic inflation rate (DOMINF)	2.81% (40.5)	Increase	Sectoral indirect tax rate on imported commodities (timr)	Appendix E: Table 1.	Decrease
Nominal interest rate (NIR)	27.08% (4.15)	Increase	Adjusting nominal interest rate (NIR0)	0.02	Increase
Unemployment (UNEMP1)	4,313,364 (5.81)	Decrease	Changes in domestic credit creation (dDC)	(2,580)B	Decrease
Gross natl. product (GNP)	201,243.76B (0.003)	Decrease	Exchange rate (ER)	1.01	Increase

Strategic Reform Policy

The strategic reform policy relies on counter cyclical fiscal policy and its supporting monetary policies. The fiscal policy is designed to prevent a severe recession and heavy unemployment. The fiscal policy is supported by an expansionary monetary policy. The strategic policy is also aimed at decreasing the current account deficit and avoiding increasing more public debts. The underlying priorities of the policy are to provide more jobs for the Indonesians and to provide a timely much needed good foundation for smaller government by helping healthy domestic companies survive the next crisis and by trimming the government size. As is the standard reform policy, the strategic reform policy is implemented together with liberalization of trade and with / when there is a devaluation of the rupiah.

The instruments for the strategic policies are: (1) government personnel expenditures (WLG), (2) government subsidies on health and education (GTH), (3) government debt services (GDS), (4) adjusting nominal interest rate (NIR0), and (5) domestic credit creation (dDC).

The magnitude changes in the instruments for the strategic reform policy is determined with the following considerations. First, as in the previous last two policies it is assumed that there is going to be more than 25 percent devaluation when the crisis comes and the changes are assigned for each percentage of rupiah's value. Second, domestic credit will altered by Rp10 billion. The changes in the credit creation (dDC) is based on the statistics published by the government as explained previously in the section about the standard policy. Third, changes in the magnitudes of government accounts are based on the

same consideration used for the standard policy. However, allocation of the changes is much different than the one applied for the standard policy. In the strategic policy, cutting the government subsidies on health and education is not a priority. There are two strategic components in the strategic policy. These are the objectives of not to jeopardize the future of the economy and to reduce operational cost of carrying public services. In this relation fiscal restraint will be implemented on the largest government spending items. Among the largest items are the government personnel expenditures (WLG), material purchases (GCONS), and the government payments on debts (GPRINCPL and GDS) because together they are more than 80 percent of the total public expenditures. Between the four items the cut will be applied more to the personnel expenditures (WLG) and interest payment on public debts (GDS) than to the other spending. The reduction in the personnel expenditures is smaller than that in the interest payment on public debts because the latter is sent abroad while the changes in the the personnel expenditures have direct impacts on domestic economy. Reducing the personnel expenditures is also a way of reducing the government size. It can be done through wage freeze for at least three years. Such action had been done in 1986 - 1988. Some other ways of reducing the government size and its consequence to public expenditures are through unifying of some government departments, giving early pension for many of current government personnel or conducting no more recruitment. In the study the money saved from curtailing the government personnel expenditures is allocated to increase the government subsidies on health and education (GTH) and the interest payment is reduced by the full amount, Rp25 billion. As its strategy, the GRI prefers to reduce the interest payment instead of taking huge borrowing or reducing its subsidies on health and education. The subsidies are important for the long term

competitiveness of the economy. It is hard for the GRI to accept a social consensus nor to be considered rationale by its people if the GRI plans a development policy or a rescue plan that increases external debts but reduces entitlement of the poor at the same time. It is also considered an irony to have much larger debt burden but to have also more poor people in a country blessed by rich natural resources like Indonesia. For many Indonesians it is easy to understand the rationale of taking loans when they are cheap but it is hard for those people to see the rational of taking more loans when the loans are expensive. The underlying assumption of the strategic policy is that the socio-economic price to be paid later as a consequence of not paying the debt obligation in full is less than the price of taking more debts with its conditionality. In this relation we can imply that the design of the standard policy assumes that the socio-economic price to be paid later as a consequence of less entitlement of the poor is less than the price of not fulfilling debt obligation.

Compared to the instruments used in the standard policy, the direction of the monetary policy and changes in the government subsidies on health and education in the strategic reform policy are different. The other differences are large reduction in the government personnel expenditures with no compensating increases in the rates of household and firm income taxes.

Results of the strategic policy are presented in Table 5.6. Descriptions of the results will be presented in certain order. Since the strategic reform policy includes the devaluation of the rupiah with the liberalization of trade, the effects of the two policies are presented before the presentation of the effects of the fiscal expansion and its supporting monetary policies. Percentage changes in the target variables are explained later when we compare the results with those from the standard policy (see Table 5.7).

The new indirect tax rates and the devaluation of the rupiah cause the import and export prices (PM and PX) to increase in all sectors. With the new prices, demand for goods and services from abroad decrease in all but 7 sectors and the exports increase in only 4 sectors (forestry and hunting; fishery; non metallic mineral; and other mineral). However, the increase of exports are more than enough to cover the leakage from additional imports and increase debt liabilities. Table 5.6 shows that there are a higher trade surplus (TRB increases), less external burden (ROWCLAIM), and less balance of payments deficit (BOP decrease). Also because of higher sectoral export and import prices (PX and PM), sectoral composite prices (PC) increase in 13 sectors and decreases in the other 9 sectors, the equilibrium prices (PQ) increase in 15 sectors but are lower in the other 7 sectors. The new equilibrium and composite prices affect sectoral net prices positively in 12 sectors and negatively in the other 10 sectors. The overall changes in the composite prices are reflected in the new general price index (GPI). The new GPI is higher than it is in the base run and causes increases of the domestic inflation rate (DOMINF).

The increased general price index is causing increased sectoral wages (WL) in 21 sectors. Lower wages in personal and household services sector (sector 22) causes the demand for labor in that sector to increase substantially. Precisely as in the case of simulating the devaluation policy, the increased of employment in sector 22 is much larger than the total decreases in the other 21 sectors such that the unemployed number (UNEMPL1) decreases (see Table 5.6). This result is important because as discussed in Chapter II the Indonesian economy can afford to have increased inflation but not heavier unemployment because the pre crisis inflation rate is low but the unemployment rate is high already.

Among other results of the strategic policy is decreased primary surplus (PRIMS). Such reduction is caused by liberalization of trade policy and increased government subsidies on health and education . By liberalizing trade the government receives less total indirect tax revenue, therefore, has lower government domestic revenue (GDR). As shown in Table 5.6 with less primary surplus the GRI can only invest less (GINV decrease) because it has to pay more subsidies. However, health and education is an important social infrastructure

As part of its strategic policy, the GRI uses negative adjusting nominal interest rates and more credit availability to reduce the nominal interest rates. With such monetary policies, the demand for money is lower even though domestic inflation rate is higher than it is in the base run, see Table 5.6.

TABLE 5.6

RESULTS OF THE STRATEGIC REFORM POLICY

Target variable	New magnitude (% change)	Direction of change	Instrument variable	New magnitude	Direction of change
Trade balance (TRB)	3,618.71B (11.59)	Increase	Government purchases of materials (GCONS)	7,400.71B	Constant
Current account balance (CAB)	(8,718.91)B (3.41)	Decrease	Government subsidy for health and education (GTH)	5,736.64B	Increase
Rest of the world's Assets (ROWCLAIM)	26,319.48B (0.49)	Decrease	Government personnel expenditures (WLG)	8,080B	Decrease
Balance of payments (BOP)	(6,233.71)B (0.66)	Decrease	Government debt services (GDS)	4,530B	Decrease
Demand of money (MOD)	23,787.71B (0.13)	Decrease	Household income tax rate (htx)	1.2%	Constant
Primary surplus (PRIMS)	2,842.75B (5.77)	Decrease	Firm income tax rate (ftx)	42%	Constant
Government investment (GINV)	13,619.99B (1.24)	Decrease	Sectoral indirect tax rate on domestic commodities (idx)	Appendix E: Table 1.	Decrease
Domestic inflation rate (DOMINF)	2.1% (5)	Increase	Sectoral indirect tax rate on imported commodities (timr)	Appendix E: Table 1	Decrease
Nominal interest rate (NIR)	23.1% (11.15)	Decrease	Adjusting nominal interest rate (NIR0)	(0.02)	Decrease
Unemployment (UNEMP1)	4,236,746.2 (8.09)	Decrease	Changes in domestic credit creation (dDC)	(2,560)B	Increase
Gross natl. product (GNP)	201,061.39B (0.09)	Decrease	Exchange rate (ER)	1.01	Increase

Conclusions

The main objective of doing the simulations is to compare the effects of the standard policies with its modified version, the strategic reform policies. The policies are compared regarding their effectiveness in decreasing the current account deficit, preventing higher unemployment and more debt burden in the future as well as providing more growth opportunity.

Smaller rest of the world's claim, the current account deficit plus total principal payments, indicates an important phenomenon. That is the standard reform policy makes debt burden heavier. Larger new loan is not included in the simulated standard policy. In reality, the nominal debt burden will also be higher in the future because of large external borrowing that accompanied the standard policy package. Such increased in debt burden is contrary to what can be expected from implementing the strategic reform policy. With the strategic policy the government tries to avoid having an increased debt burden in the future by not taking additional large loans at the first place.

The government has less primary surplus and is less able to create growth with the strategic reform policy. The primary surplus increased by 1.3 percent and the government total investment increased by 1.1 percent with the standard policy but they decreased by 5.77 and 1.24 percent with the strategic policy. Such comparison can be seen from rows 6 and 7, column 4 and 5 of Table 5.7. The changes in primary surplus are caused by the changes in the expenditures for health and education. With the strategic policy the economy will benefit from much better human resources in the future because in the standard policy the expenditure for health and education is reduced while in the strategic policy it is increased.

In addition, the economy needs less government growth creation because employment level is higher with the strategic reform policy (8.09 percent).

Decreases in the gross national product is lower with the simulated standard policy (0.003 percent), compared it is by the strategic policy (0.09 percent). The higher gross national product (nor more employment) may not be happening if the standard policy is implemented in the reality because many firms are likely to be dying with higher than inflation nominal interest rate component of the policy. When the domestic firms are incapable of leading the development, the government has to take charge again with the continued and higher dependence on foreign creditors. The strategic policy helps the previously healthy domestic firms to survive by reducing the discount rate from the central bank to encourage their production because in the past foreign investors can pull back their investment at almost any second. Such a high power of the foreign investors can cause crisis any time and the Indonesian government who already has limited maneuver ability will not be able to prevent it.

Table 5.7 compares percentage changes in the target variables from the simulations of the standard policy with those of the strategic reform policy. Preference of the results are shown in column 3. The column shows that higher trade surplus is preferred over the lower one and that lower current account deficit and lower unemployment are preferred over the higher ones. It is implied with such preference that the policy which can give the preferred result is better than the other one (column 6). Columns 4 and 5 show how much percentage change in the target variable from simulating the standard and the strategic policies. Column 6 shows in which policy we get better result for each target. For example, in row one, the strategic policy is better because even though both policies causes higher trade surplus, the

surplus is higher with the strategic policy. Among other things, Table 5.7 shows that the current account deficit and rest of the world's claim are lower with the strategic policy than they are with the standard policy. Overall, column 6 shows that seven out of 10 preferred results happen when we implement the strategic reform policy. Therefore, the strategic policy is better than the standard one.

TABLE 5.7

COMPARISON OF THE SIMULATION RESULTS OF THE STANDARD AND THE STRATEGIC REFORM POLICIES

	Target variable	Preference	Changes of the target variable (percentage)		Better policy
(1)	(2)	(3)	Standard (4)	Strategic (5)	(6)
1	Trade surplus	Higher	7.31	11.59	Strategic
2	Current account deficit	Lower	(-) 1.38	(-) 3.41	Strategic
3	Rest of the world's assets	Lower	11.24	(-) 0.49	Strategic
4	Balance of payments	Lower	3.51	(-) 0.66	Strategic
5	Primary surplus	Higher	1.33	(-) 5.77	Standard
6	Government investment	Higher	1.1	(-) 1.24	Standard
7	Domestic inflation rate	Lower	40.5	5	Strategic
8	Nominal interest rate	Lower	4.15	(-) 11.15	Strategic
9	Unemployment	Lower	(-) 5.81	(-) 8.09	Strategic
10	Gross national product	Higher	(-) 0.003	(-) 0.09	Standard

CHAPTER VI

SUMMARY, POLICY IMPLICATIONS AND LIMITATIONS OF THE STUDY

Summary

The following sections are summaries of discussion presented in the previous chapters. The first section is a description of the Indonesian economy's possibility of having another external debt crisis. The second section describes the objectives of the study and the CGE model used for the study. The third section summarizes contradictions and possible effects of the standard policy package usually offered by the IMF. The last sections are summaries of the strategic reform policy and compare results from the simulations of the standard and strategic policies.

The Indonesian economy is in a very fragile condition. By the end of 1996, it had every condition that Mexico had before it experienced 1995 debt crisis. Those were enlarging current account deficits, high dependence on portfolio capital flows, weak financial sector and an upcoming election. High dependence on foreign capital and heavy obligations to external creditors are the main sources of the economy's vulnerability to any external shock directly or indirectly targeted to itself. The private sector has a possibility of facing a debt repayment problem and such problem may cause the whole economy to experience another debt crisis. There are three reasons to handle the next crisis differently

from the way the GRI coped with the previous crises. First, the magnitude of the debts is huge and they are owed by the private sector and the government. Second, the economy has a low inflation rate but faces tougher competition for maintaining its export as well as its domestic markets. Failure for maintaining the markets could make the economy fall deeper into debt. Third, the economy has a very high dependence on imported commodities and foreign capital. Fourth, the world economy is very interdependent and some countries have huge claims on the Indonesian economy so that when the Indonesian economy is in recession, those countries will feel its negative effects as well.

Assuming that a debt crisis occurs and the government of the Republic of Indonesia (GRI) proposes to use the IMF facilities, the study tries to determine if GRI should take for granted the typical stabilization policy package offered by the IMF. In order to answer such questions, the study analyzes the theoretical background of the standard policy, develops a modified policy and a CGE model, then simulates both policies with the model.

The CGE model is designed to meet the theory behind the IMF standard policy model (chapter IV). There are three unique qualities of the CGE model. First, the model accommodates a variable to show how much money the Indonesians have to come up with for returning principal and interest on their previous debts and for using more imported goods and services than they can pay for by exporting goods and services abroad (ROWCLAIM). In order to show the magnitudes of other countries' claims on the economy, the model acknowledges four parts of balance of payments instead of just the current account balance. Those are merchandise trade balance, current account balance, financial / capital accounts and the balance of payments itself. Second, the model includes a simple monetary sector and uses the terminology used by the GRI to integrate more reality. Third,

the model specifies the relationship between interest, inflation and exchange rates explicitly.

The standard policies are typical policies for deficit and inflationary economies that are likely to be offered by the IFIs whenever a country takes stabilization and adjustment loans. There are several contradictions among the policies and all together, they preserve the condition of already high dependence on foreign capital and cause a larger debt burden than before. When the policies are implemented in a crisis situation, the possible effects are heavy recession and high unemployment following roaring imported inflation, and bankruptcies of domestic firms, in addition to reduction of health and other subsidies for many poor people. The standard austerity policy is politically difficult to carry out, especially when the government is becoming less popular. The standard policies will bring back growth only after foreign investors are willing to invest again in the economy.

The strategic reform policy is a modified version of the standard policy. The modification is needed to avoid heavy recession and unemployment which may lead to possible losses of export markets and long term growth opportunities. This policy is referred to as strategic reform policy because it is aimed to solve a long term phenomenon, not just to solve a seemingly short term current account deficit problem. The main theme of the strategic reform policy is to strategically increase the survival chance of the private sector so that they can lead the development after the crisis instead of giving the domestic economy up cheaply to foreign investors. It is believed that unless the domestic economy is strengthened, the economy will suffer more when it faces another shock in the future. The objectives of the strategic policy are to cope with the crisis without incurring lasting damage to the economy and to minimize reductions in entitlements for the poor. The policy is supposed to be declared by the Indonesian government as its commitment to the AFTA

community. The policy is not standard, because it is not another donor sponsored program but a program based on social consensus of its own people. It deals with private sector difficulties in servicing its debts by preventing unnecessary dying of previously healthy firms in the crisis and by including some kind of debt reduction scheme. The strategic policy tries to improve the structural condition of the economy by nurturing the economy's growth potential, which among other things is the competence of its people. Such a policy is represented by government's higher spending on health and education. In summary, among the main policies are: to follow the AFTA liberalization schedule; to provide stability of output production; to maintain export as well as domestic markets by promoting exports and providing credit liquidity to import intermediate inputs; and to postpone "standard" austerity policy until the GRI gets approval from the Indonesian people and cooperation from other countries to share the burden multilaterally.

The first three simulations with the CGE model are focused on the very basic components of the adjustment and reform policies; those are liberalization of the real sector, a certain level of devaluation and some austerity policies. Following are the main findings. (1) The devaluation should be considered as an assistant to the efforts of transforming the economy into one that is more creative in allocating its resources and supplying goods and services abroad. (2) The economy will not benefit much from further liberalization, assuming that the SAM data regarding the present indirect taxes are correct. (3) The austerity policy is detrimental to the external balance and internal balances. It reduces the trade surplus and increases the level of unemployment substantially.

The standard and strategic reform policies are then simulated with the CGE model. The standard policy is a combination of the austerity policy with the devaluation and

liberalization of the real sector. The main components of the strategic reform policy are: reductions in government personnel expenditures and in the adjusting nominal interest rate, and an increase of maximum credit emissions. The debt reduction scheme was included in the simulation. The policies are compared with regard to their effects on the internal and external balances. The improvement on trade balance and employment is noticeable in both policies. Therefore, it is not true that the standard policy is influencing the balances negatively. The strategic policy causes higher trade surplus, lower obligation to abroad and also lower unemployment compared to the standard policy.

Policy Implications

There are three sets of policy implications. They are derived from reviewing the economic condition during 1990 - 1996, from reviewing the theoretical background of the standard IMF policy, and from the simulations.

The following policies are to be implemented before the crisis comes. They are derived from the discussion in Chapter II. First, there should be a serious attempt to fix the economy's sources of vulnerability, and the GRI should really try harder to have a reliable record of the usage of public and publicly guaranteed debts. In this relation, the GRI should make the record available for public review. Second, the GRI should carefully consider how a policy will affect private sector ability to fulfill their debt obligation before it implements any policy. The second one is then included in the simulation of the strategic policy. Third, the GRI should design development and crisis rescue plans that do not increase the debt burden in the future.

The following implications are taken from reviewing theoretical background of the typical rescue plan offered by the IMF, which is referred as the standard IMF policy (Chapter III). First, the GRI should anticipate and deal with the private sector difficulties in servicing debts and should also help "healthy" domestic firms to survive. Second, the GRI should postpone a wide scale austerity policy until it gets approval from the Indonesian people and cooperation from other countries to share the burden multilaterally. There are two ways of sharing the burden. (1) By preventing the Indonesian economy from losing its export markets, because otherwise it will be more difficult for the economy to fulfill its debts, and because rapid export growth is essential for the survival of the economy after the crisis. (2) By giving some kind of debt reduction to lessen the economy's vulnerability to external shock. The GRI should strengthen multilateral cooperation through AFTA and the CGI forum. Third, if the GRI needs to use the IMF stabilization funds, then the GRI should not come to the IMF without carrying a detailed modified standard rescue plan.

The following implications are derived from the simulation results reported in Chapter V. First, in its detailed rescue plan, the GRI should start the austerity policy with reducing government personnel expenditures to show the GRI's initiatives to correcting itself. Second, the GRI should use the coming "another external shock (depreciation of the rupiah)" to promote the idea of restructuring the production strategy instead of increasing dependence on foreign imported inputs and capital. Third, the GRI should try to get credibility for its policies by following AFTA's schedules and choosing non-standard structural adjustment policies with the least additional future debt burden and less damage to the employment provision of the economy, and only to implement the policies after asking social approval from the Indonesian people.

Limitations of the Study

There are several limitations of the study which deserve some attention when considering the policy implications and the findings of this study. First, the model only accommodates a simple monetary sector, therefore, from one view point the economy in the CGE model developed for this study is very simple compared to that in reality. However, from the orthodox theoretical viewpoint, the choice of monetary policy instruments in the model is as limited as they are when a crisis develops. Second, results of the policy simulations should be interpreted carefully, because even though the study is done for analyzing 1990 to 1996 data, the data used for this study were from the 1990 Indonesian SAM and were not modified with later information. Therefore, the magnitudes are less important compared to "more realistic" policy choices of the simulations which the policy recommendations are based on.

There are also some disadvantages of using a CGE model that embodied in using the model built in this study. Among them is: it is very sensitive to price and parameter changes. Such sensitivity exists probably because some of the variables are exogenously determined instead of defined as functions of the rest of the variables, or because the nominal interest rate is determined too explicitly. However, these disadvantages are submerged by the fact that the model allows manipulation of different policy tools at the same time and shows their effect to many sectors and agents in the economy.

The model may be improved by adding more monetary and financial phenomena, or by adding oil price as another factor that explicitly influences government revenue. Making the model dynamic may not necessarily improve the quality of the model.

BIBLIOGRAPHY

Aggarwal, Vinod. (1996). *Debt Games: Strategic Interaction in International Debt Rescheduling*, Cambridge University Press, New York.

Ahmed, Sadig. (1993). Appropriate Macroeconomic Management in Indonesia's Open Economy, *The World Bank,* Discussion Paper 191.

Ahmed, Sadig and A. Chhibber. (1989). How Can Indonesia Maintain Creditworthiness and Non Inflationary Growth, *The World Bank,* PPR. Working Papers No.291, October.

Alawode, A. A. (1997). Some Criticisms of the Monetary Approach to the Balance of Payments, *Economia Internazionale*, 50, 13-25.

Atkeson, A. and José-Víctor Ríos-Rull. (1996). The Balance of Payments and Borrowing Constraints: An Alternative View of the Mexican Crisis, *Journal of International Economics*, 41, 331-349.

Barth, Richard C., Alan R. Roe and Chorng-Huey Wong. (1994). *Coordinating Stabilization and Structural Reform*, International Monetary Fund, Washington D.C.

BPS. (1994). *Input-Output Tables 1990,* Central Bureau of Statistics, Jakarta.

BPS. (various issues, 1989-1996). *Statistical Pocketbook of Indonesia,* Central Bureau of Statistics, Jakarta.

Bleaney, Michael F. (1997). Is Good Macroeconomic Management Important for Growth? *Journal of Macroeconomic*, 19(3), 523-537.

Budiyanti, Rini. (1996). Application of General Equilibrium for Measuring Regional Economic and Welfare Impacts of Quality Changes in Sport Fishing in Oklahoma, Unpublished Ph.D. Thesis, Oklahoma State University, Oklahoma.

Calvo, Guillermo and Enrique G. Mendoza. (1996). Mexico's Balance of Payment Crisis: A Chronicle of a Death Foretold, *Journal of International Economics,* 41, 235-264.

Chander, R., C.L. Robless, and K. P. Teh. (1981). Malaysian Growth and Price Stabilization, in Cline, W. R.. World Inflation and the Developing Countries, The Brookings Institution, Washington, D.C., pp. 208 - 227.

Chang, Wen-Ya and Ching-Chong Lay. (1997). The Specification of Money Demand, Fiscal Policy and Exchange Rate Dynamics, *Journal of Macroeconomics*, 19(1), 79-102.

Chhibber, A. and M. Dailami. (1993). Fiscal Policy and Private Investment in Developing Countries: Key Selected Issues in Faini, Riccardo and Jaime de Melo, (eds), *Fiscal Issues in Adjustment in Developing Countries,* St. Martin's Press, New York, pp. 121 - 150.

Chhibber, A. and N. Shafik. (1990). Does Devaluation Hurt Private Investment: The Indonesian Case, *The World Bank*, PPR Working Paper No. 418.

Chiew, Eddie J. (1997). ASEAN and AFTA: A Partnership of Progress, Paper presented at Seminar, the Sixth TUN ABDUL RAZAK Conference, Ohio University.

Claessen, Stijn. (1993). Alternative Forms of External Finance: A Survey, *The World bank Research Observer*, 8(1), 91-117.

Claessen, Stijn and Ishac Diwan. (1990). Investment Incentives: New Money, Debt Relief, and the Critical Role of Conditionality in the Debt Crisis, *The World bank Economic Review,* 4(1), 21-41.

Clark, Peter et. al. (1994). *Exchange Rates and Economic Fundamentals: A Framework for Analysis*, IMF, Washington, D.C.

Cline, William R. (1995). *International Debt Reexamined*, Institute for International Economics, Washington, D.C.

Cline, William R. (1983). Economic Stabilization in Developing Countries: Theory and Stylized Facts, in Williamson, John (ed) *IMF Conditionality*, The Institute for International Economics, Washington, D.C., pp. 175 - 208.

Collier, Paul and Jan Willem Gunning. (1994). Trade and Development: Protection, Shock and Liberalization, in Greenway, David and L. Alan Winters (eds), *Survey in International Trade,* Blackwell, Oxford UK, pp. 206 - 233.

Cole, Harold L and Patrick J. Kehoe. (1998). Model of Sovereign Debt: Partial Versus General Reputations, *International Economics Review,* 39

Cole, Harold L and Timothy J. Kehoe. (1996). A Self-Fulfilling Model of Mexico's 1994-1995 Debt Crisis, *Journal of International Economics*, 41, 309-330.

Daniel, Betty C. (1997). Precautionary Saving and Persistent Current Account Imbalance, *Journal of International Economics,* 42, 179-193.

Dell, Sidney. (1983). Stabilization: The Politic Economy of Overkill, in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, DC, pp. 17 - 45

de Melo, Marta. (1993). Fiscal Adjustment in High-Debt Countries, in Faini, Riccardo and Jaime de Melo (eds), High-Debt Countries in *Fiscal Issues in Adjustment in Developing Countries,* St. Martin's Press, New York, pp. 99 - 120.

Dervis, Kemal, Jaime de Melo, Sherman Robinson. (1982). *General Equilibrium for Development Policy*, A World Bank Research Publication, University Press, Cambridge.

Dernburg, Thomas F. (1989). *Global Macroeconomics*, Harper & Row Publishers, New York.

Devarajan, Shantayanan, Jeffrey D. Lewis and Sherman Robinson. (1993). External Shocks, Purchasing Power Parity, and the Equilibrium Real Exchange Rate, *The World bank Economic review,* 7(1), 45-63.

Dornbusch, R. and S. Fischer. (1994). *Macroeconomics, Sixth Edition,* McGraww Hill,. New York.

Dornbusch, R. (1983). Comments in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, D.C., pp. 223 - 230.

Drysdale, Peter and Yiping Huang. (1997). Technological Catch-up and Economic Growth in East Asia and The Pacific, *The Economic Record,* 73, 201-211.

Eaton, Jonathan. (1993). Sovereign Debt: A Primer, *The World Bank Economic Observer*, 7(2), 137-172.

Eaton, Jonathan. (1987). Public Debt Guarantees and Private Capital Flight, *The World Bank Economic Observer*, 1(3), 377-395.

Easterly, William and Klaus Schmidt-Hebbel. (1993). Fiscal Deficits and Macroeconomic Performance in Developing Countries, *The World Bank Research Observer*, 8(2), 211-237.

Easterly, William, Norman Loayza and Peter Montiel. (1997). Has Latin America's Post Reform Growth Been Disappointing? *Journal of International Economics,* 43, 287-311.

Edmand, Michael R. (1987). *Macroeconomics: Theory and Policy.* Third edition. Prentice Hall, New Jersey.

Edwards, Sebastian. (1989). Structural Adjustment Policies in Highly Indebted Countries, in Sachs, J.D. (ed), *Developing Country Debt and the World Economy*. NBER. The University of Chicago Press, Chicago, pp. 249 - 262.

Feld, Werner J. and Robert S. Jordan with Leon Hurtwitz. (1988). *International Organizations: A Comparative Approach*, 2nd ed. Praeger, New York.

Figgie, Harry E. (JR) with Gerald J. Swanson. (1992). *The Coming and Collapse of America and How to Stop It*, Little, Brown and Company, Boston.

Fisher, S. (1988). Economic Development and the Debt Crisis, *The World Bank*, PPR Development Economics Working Papers No.17, June.

Flood, Robert P., Peter M. Garber, Charles Kramer. (1996). Collapsing Exchange Rate Regimes: Another Linear Example, *Journal of International Economics,* 41, 223-234.

Frankel, Jeffrey A. and Andrew K. Rose. (1996). Currency Crashes in Emerging Markets: An Empirical Treatment, *Journal of International Economics,* 41, 351-366.

Fry, Maxwell J. (1995). *Money, Interest, and Banking in Economic Development*, 2nd, John Hopkins University Press, Baltimore.

Harper, Richard H.R. (1994). *Inside the IMF: An Ethnography of Documents, Technology and Organizational Action*, Academic Press, San Diego.

Hill, Hal. (1996). *The Indonesian Economy Since 1966: Southeast Asia's Emerging Giant,* Cambridge University Press, UK.

Hill, Hal. (1994). *Indonesia's New Order: the Dynamics of Socio-Economic Transformation*, University of Hawaii Press, Honolulu.

IMF. (1997a). *International Financial Statistics.*

IMF. (1997b). *World Economic Outlook May 1997: Globalization, Opportunities and Challenges.*

IMF. (1997c). *World Economic Outlook Dec. 1997: Interim Assessment "Crisis in Asia Regional and Global Implications,* International Monetary fund.

Jayarajah, C. and W. Branson. (1995). *Structural and Sectoral Adjustment: World Bank Experience 1980-1992,* The World Bank, Washington, D.C.

Jeanne, Oliver. (1997). Are Currency Crises Self-Fulfilling? A Test, *Journal of International Economics*, 43, 263-286.

Kamin, Steven B. and John H. Rogers. (1996). Monetary Policy in the End-Game to Exchange-Rate Based Stabilization: the Case of Mexico, *Journal of International Economics,* 41, 285-307.

Keyzer, M.A, W.C.M. van Veen, and W. Tims. (1992). The SOW Applied General Equilibrium Model in Thorbecke, E. et al. (1992a). *Adjustment and Equity in Indonesia,* OECD- Development Centre Studies, Paris, pp.113 - 119

Khan, Mohsin S. and Carmen M. Reinhart. (1995). *Capital Flows in the APEC Region,* International Monetary Fund, Washington, D.C.

Kildegaard, Arne. (1997). Foreign Finance And the Collapse of the Mexican Peso, *Journal of Economic Issues*, 4, 951-967.

Klein, Thomas M. (1994). *External Debt Management: An Introduction,* The World Bank, Washington, D.C.

Koh, Y. (1991). Analysis of Oklahoma's Boom and Bust Economy by Means of a CGE Model, Unpublished Ph.D. Thesis, Oklahoma State University, Oklahoma.

Lichtensztejn, Samuel. (1983). IMF-Developing Countries: Conditionality and Strategy, in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, D.C., pp. 209 - 222.

Lim, Linda. (1997). The Southeast Asian Currency Crisis and Its Aftermath, Commentary, *Journal of Asian Business*, 13(4), 65-83.

Lindert, Peter H. and Peter J. Morton. (1989). How Sovereign Debt Has Worked, in Sachs, J.D. (ed), *Developing Country Debt and the World Economy*, NBER, The University of Chicago Press, Chicago, pp. 225 - 235.

Little, I.M.D, et al. (1993). *Boom, Crisis, and Adjustment: The Macroeconomic Experience of Developing Countries*, Oxford University Press.

Mangkusuwondo, Suhadi. "Indonesia in the Proses of The World Economic Integration," in *Alumni FEUI and Challenges in the Future: Various Thoughts,* ILUNI UI-FE, Gramedia Pustaka Utama, Jakarta, pp. 23 - 34. (in Indonesian).

Mikesell, Raymond. F. (1983). Appraising IMF Conditionality: Too Loose, Too Tight, or Just Right, in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, D.C., pp. 47 - 62.

Ministry of Industry and Trade. (1995). *Analysis of Indonesian Trade*, 11 (in Indonesian).

Mitra, Pradeep. (1992). The Coordinated Reform of Tariffs and Indirect Taxes, *The World Bank Research Observer*, 7(2), 195-218.

Morrison, C.J and A. E. Schwartz. (1996). State Infrastructure and Productive Performance, *The American Economic Review*, 86(5), 1095-1111.

Mundlak, Yair, Domingo Cavallo and Roberto Domenech. (1990). Effects of Macroeconomic Policies on Sectoral Prices, *The World Bank Economic Review*, 4(1), 55-79.

Mussa, Michael et al. *Improving the International Monetary System: Constrains and Possibilities,* International Monetary Fund, Washington, D.C.

Negash, Johannes, Han-Sung Lee and Dean F. Schreiner. (1994). Regional Computable General Equilibrium Model, Manual, Department of Agricultural Economics, Oklahoma State University, Oklahoma.

Newman, Ross. (1998). Money Demand and Nominal Debt: An Equilibrium Model of the Liquidity Effect, *Journal of Macroeconomics*, 20(2), 267-293.

New Zealand Ministry of Foreign Affairs and Trade. (1994). *United Nations Handbook.* Hutchison, Bowman and Stewart Ltd, Wellington.

Nguyen, Trien T. (1997). ASEAN Trade Liberalization Under WTO and AFTA: The Large and Small of It, Paper presented at Seminar, the Sixth TUN ABDUL RAZAK Conference, Ohio University.

Omae, Ken'ichi. (1995). *The End of the Nation State: the Rise of Regional Economies*, Free Press, New York.

Payer, Cheryl. (1974). The Debt Trap: The International Monetary Fund and the Third World. Monthly Review Press, New York.

Pangestu, Mari. (1996). *Economic Reform, Deregulation and Privatization: The Indonesian Experience,* Centre for Strategic and International Studies, Jakarta.

Poot, Huib, Arie Kuyenhoven, Jaap Jansen. (1992). *Industrialisation and Trade in Indonesia*, Gadjah Mada University Press, Yogyakarta.

Ramly, Rizal. (1991). Foreign Debts of Indonesia: Contraction and Economic Burden, *Prisma*, 9(xx), 3 - 11.

Rivera-Batiz, Fransisco L. and Luis A. Rivera-Batiz. (1994). *International Finance and Open Economy Macroeconomics*, Second Edition, Macmillan Publishing Co, New York

Robinson, Sherman. (1991). Macroeconomic, Financial Variables, and Computable General Equilibrium Models, *World Development,* 19(11), 1509-1525.

Robles, Blanca Sanchez. (1998). Infrastructure Investment and Growth: Some Empirical Evidence, *Contemporary Economic Policy*, 16, 98-109.

Rondinelli, Dennis A. and John D. Kasarda. (1993). Job Creation and Economic Development in Indonesia: The Critical Role of Small Business, *Journal of Asian Bus*iness, 9(1), 69-85.

Sachs, Jeffrey D. (1989). Conditionality, Debt Relief, and the Developing Country Debt Crisis, in Sachs, J.D. (ed) *Developing Country Debt and the World Economy*, NBER, The University of Chicago Press, Chicago, pp. 275 - 284.

Sachs, Jeffrey, Aarón Tornell and Andrés Velasso. (1996). The Mexican Peso Crisis: Sudden Death or Death Foretold, *Journal of International Economics,* 41, 265-283.

Schadler, Susan. (1995). *IMF Conditionality: Experience Under Stand-By and Extended Arrangements. Part I: Key Issues and Findings*, International Monetary Fund, Washington, D.C.

Schiling, John. (1983). Comments, in Cline, William R. Cline, William R. (1983). Economic Stabilization in Developing Countries: Theory and Stylized Facts, in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, D.C., pp. 175 - 208.

Schwarz, A. (1995). *A Nation in Waiting: Indonesia in the 1990s*, Westview Press, Boulder.

Soesastro, Hadi, (ed). (1994). *Indonesian Perspectives on APEC and Regional Coope*ration *in Asia Pacific,* Centre for Strategic and International studies, Jakarta.

Solimanto, A. (1990). How Private Investment Reacts to Changing Macroeconomic Conditions: The Case of Chile in the 1980s, *The World Bank*, PPR Working Paper No. 212.

Tanner, J. Ernest and Donn Pescatrice. (1998). Was Monetary policy Impotent or Simply Contracyclical in the 1980s? *Journal of Macroeconomics*, 20(1), 55-80.

Taylor, L. (1993). Fiscal Issues in Macroeconomic Stabilization: A Structural Perspectives, in Faini, Riccardo and Jaime de Melo (eds), *Fiscal Issues in Adjustment in Developing Countries,* St. Martin's Press, pp. 61 - 77.

Thee, Kian Wie. (1995). Economic Growth and the Advancement of Technology in Indonesia in the Long Run, in *Alumni FEUI and Challenges in the Future: Various Thoughts,* ILUNI UI-FE, Gramedia Pustaka Utama, Jakarta, pp. 141 - 160 (in Indonesian).

Thomas, Vinod and John Nash. (1991). Reform of Trade Policy: Recent Evidence from Theory and Practice, *The World Bank Research Observer*, 6(2), 219-240.

Thorbecke, Erik et al. (1992a). *Adjustment and Equity in Indonesia,* OECD- Development Centre Studies, Paris

Thorbecke, Erik. (1992b). The Social Accounting Matrix Framework to Capture The Interdependence between Domestic and Foreign Variables, in Anwar, M. A, Thee Kian Wee, Iwan Jaya Azis. (eds), *Ideas, Implementation and Initiation in the Development of the Economy,* FE-UI, Jakarta, pp. 670 - 698.

Vatikiotis, Michael R.J. (1994). *Indonesian Politics under Soeharto: Order, Development and Pressure for Change*, Routledge, London and New York.

Vito Tanzi. (1993). Fiscal Issues in Adjustment program, in Faini, Riccardo and Jaime de Melo (eds), High-Debt Countries in *Fiscal Issues in Adjustment in Developing Countries,* St. Martin's Press, New York, pp. 21 - 42.

Widodo, S.T. (1990). *Economic Indicators: Measurement Method in the Indonesian Economy*, Kanisius Publisher, Yogyakarta, 1990 (in Indonesian).

Williamson, John and Donald R. Lessard. (1987). *Capital Flight: The Problem and Policy Response*, The Institute for International Economics, Washington, D.C.

Williamson, John. (1983). On Judging the Success of IMF Policy Advice, in Williamson, John (ed), *IMF Conditionality*, The Institute for International Economics, Washington, D.C, pp. 129 - 143.

Woo, Wing Thye, B.Glassburner and A. Nasution. (1994). *Macroeconomic Policies, Crises, and Long-Term Growth in Indonesia, 1965-1990.* The World Bank, Washington, D.C.

World Bank. (1997). *Global Development Finance*, Volume 1, 2.

World Bank. (1995). *World Debt Tables: External Financing for Developing Countries 1994 - 95,* Volumes 1 and 2.

World Bank. (1994). *Indonesia: Sustaining Development.*

APPENDIXES

APPENDIX A

SUPPORTING DATA

APPENDIX A: TABLE 1

POPULATION AGED 10 YEARS AND OVER WHO WORKED DURING THE PREVIOUS WEEK BY MAIN EMPLOYMENT STATUS
1990 - 1995

Year	Main employment status					Total (6)
	Self employed (1)	Self employed assisted by family member / temporary employee (2)	Employer (3)	Employee (4)	Unpaid worker / family worker (5)	
1990	14,931,076	17,937,511	592,667	21,076,453	21,311,706	75,850,580
1991	15,437,307	17,543,835	641,817	22,373,691	20,425,559	76,423,179
1992	15,744,624	18,277,794	659,013	23,022,905	20,814,036	78,518,372
1993	16,465,090	17,974,736	731,618	24,456,587	19,572,511	79,200,542
1994	20,025,275	15,566,052	1,255,895	28,498,330	14,764,508	80,110,060
1995	18,345,530	21,294,955	1,198,225	28,951,741	15,911,362	85,701,813

Note: (6) = (1)+(2)+(3)+(4)+(5)+ (not stated).
Source: BPS, 1991 - 1996.

APPENDIX A: TABLE 2

RATES OF INTEREST, EXCHANGE AND INFLATION
1980 - 1997

Year	Interest rates	Exchange rates	Inflation rates (%)
1980	6	627	18.5
1981	6	644	12.2
1982	6	692	9.5
1983	6	994	11.8
1984	16	1,074	10.5
1985	18	1,125	4.7
1986	18	1,641	5.9
1987	18	1,651	9.1
1988	18	1,726	5.8
1989	18	1,795	6.0
1990	24	1,892	12.48
1991	24	1,961	10.84
1992	24	2,062	9.23
1993	24	2,110	12.82
1994	24	2,200	12.35
1995	24	2,308	9.24
1996	24	2,383	8.64
1997	30	3,850 (in December, 60% depreciation from July'97)	6.47

Source: 1980 - 1990: Woo, Glassburner and Nasution, 1994, p.167
1992: The World bank, 1994, p.79.
BPS, Statistical Pocketbook of Indonesia, 1996, p.481.
Others.

APPENDIX A: TABLE 3

SERVICE PAYMENTS AND OUTSTANDING AMOUNTS
OF EXTERNAL PUBLIC DEBT
(US$ THOUSAND)

Year	Debt outstanding	Service payments		
	(Including undisbursed)	Principal	Interest	Total
1980	24,509,975	939,494	823,811	1,763,305
1981	26,953,145	1,054,106	990,708	2,044,814
1982	32,007,959	1,104,100	1,132,291	2,236,391
1983	35,297,509	1,288,872	1,233,096	2,521,968
1984	36,352,169	1,599,633	1,628,892	3,228,525
1985	42,784,096	2,329,754	1,642,524	3,972,278
1986	50,088,546	2,621,963	2,071,669	4,693,632
1987	60,447,572	3,405,766	2,272,912	5,678,678
1988	60,076,075	4,437,776	2,525,349	6,963,125
1989	59,715,366	4,435,217	2,501,122	6,936,339
1990	65,095,595	4,129,417	2,534,505	6,663,922
1991	69,003,554	4,172,108	2,645,766	6,817,874
1992	70,910,847	5,007,001	2,828,308	7,835,309

Source: The World Bank, 1994, p.186.

APPENDIX A: TABLE 4

VALUE OF EXPORTS AND IMPORTS 1980 - 1996
(US$ MILLION)

Year	Including petroleum and gas			Excluding petroleum and gas		
	Exports	Imports	Surplus	Exports	Imports	Deficit
1980	23,950.4	10,834.4	13,116.0	6,168.8	9,090.4	(2,921.6)
1981	25,164.5	13,272.1	11,892.4	4,501.3	11,550.8	(7,049.5)
1982	22,328.3	16,858.9	5,469.4	3,929.0	13,314.1	(9,385.1)
1983	21,145.9	16,351.8	4,794.1	5,005.2	12,207.0	(7,201.8)
1984	21,887.8	13,882.1	8,005.7	5,869.7	11,185.3	(5,315.6)
1985	18,586.7	10,259.1	8,327.6	5,868.9	8,963.5	(3,094.6)
1986	14,805.0	10,718.0	4,087.0	6,528.4	9,632.0	(3,103.6)
1987	17,135.6	12,370.3	4,765.3	8,579.6	11,302.4	(2,722.8)
1988	19,218.5	13,248.5	5,970.0	11,536.9	12,339.5	(802.6)
1989	22,158.9	16,359.6	5,799.3	13,480.1	15,164.4	(1,684.3)
1990	25,675.3	21,837.0	3,838.3	14,604.2	19,916.6	**(5,312.4)**
1991	29,142.4	25,868.8	3,273.6	18,247.5	23,558.5	**(5,311.0)**
1992	33,967.0	27,279.6	6,687.4	23,296.1	25,164.6	(1,868.5)
1993	36,823.0	28,327.8	8,495.2	27,077.2	26,157.2	920.0
1994	40053..4	31,983.5	8,069.5	30,359.8	29,616.1	743.7
1995	45,418.0	40,628.7	4,789.3	34,953.6	37,717.9	(2,764.3)
1996	49,814.8	42,928.5	6,886.3	38,093.0	39,333.0	(1,240.0)

Source: BPS, Statistical Pocketbook of Indonesia, 1996.

APPENDIX A: TABLE 5

NON OIL / GAS IMPORTS COMPOSITION
(US$ MILLION)

CLASSIFICATION	1993	1994	Change (%)	Jan - Aug 1994	Jan - Aug 1995	Change (%)
Total non oil / gas import	26,230.80	29,616.10	12.91	18,731.00	24,648.60	31.59
1. Consumption commodities	1,105.30	1,363.40	**23.35**	803.70	1,565.00	**94.72**
a. Unprocessed food and drink for households	139.60	192.50	37.89	125.00	176.90	41.52
b. Processed food and drink for households	180.40	375.70	108.26	164.00	678.00	313.41
c. Fuel and oil	18.30	21.80	19.13	14.00	21.30	52.14
d. Transportation (not for industry)	108.30	53.60	(50.51)	42.40	53.30	25.71
e. Durable consumption goods	104.10	115.00	10.47	75.40	131.70	74.67
f. Perishable consumption goods	244.70	272.20	11.24	168.50	190.60	13.12
g. Semi perishable consumption goods	220.60	264.70	19.99	172.40	212.70	23.38
h. Other commodities	89.30	67.90	(23.96)	41.90	100.50	139.86
2. Raw materials and intermediate products	17,978.60	20,833.00	**15.88**	13,097.90	17,542.90	**33.94**
a. Unprocessed food and drink for industries	743.60	986.10	32.61	683.50	852.00	24.65
b. Processed food and drink for industries	243.50	219.20	(9.98)	148.90	280.60	88.45
c. Unprocessed raw materials for industries	1,528.30	1,769.30	15.77	1,117.80	1,618.70	44.81
d. Processed raw materials for industries	10,154.70	11,502.00	13.27	7,207.50	9,786.70	35.78

APPENDIX A: TABLE 5 (Continued)

CLASSIFICATION	1993	1994	Change (%)	Jan - Aug 1994	Jan - Aug 1995	Change (%)
e. Unprocessed fuel and oil	22.40	13.00	***(41.96)***	8.10	24.60	**203.70**
f. Unprocessed fuel and oil	38.80	46.30	19.33	29.80	45.40	52.35
g. Parts and supplements of capital goods	3,397.10	3,307.60	(2.63)	2,118.10	2,483.30	17.24
h. Parts and supplements of transportation goods	1,850.20	2,989.30	**61.57**	1,784.30	2,451.70	37.40
3. Capital goods	7,146.90	7,419.70	**3.82**	4,829.40	5,540.60	**14.73**
a. Capital goods (except transportation parts)	6,547.90	6,575.90	0.43	4,320.40	4,953.30	14.56
b. Passenger cars	95.40	43.10	(54.82)	37.30	40.60	8.56
c. Transportation modes	503.50	800.70	59.03	471.60	546.20	15.82

Source: Ministry of Industry and Trade, 1995, p.23.

APPENDIX A: TABLE 6

ACTUAL GOVERNMENT ROUTINE AND DEVELOPMENT EXPENDITURES
1990 / 1991 - 1996 / 1997
(Rp BILLION)

Types of expenditures	1990 / 1991	1991 / 1992	1992 / 1993	1993 / 1994	1994 / 1995	1995 / 1996
I. ROUTINE EXPEND.						
1. Personnel expenditures	7,053	8,102	9,466	11,145	13,069	15,372
a. Rice allowance	640	922	888	834	1,038	1,134
b. Salaries and pensions	5,570	6,299	7,533	9,145	10,490	12,351
c. Food allowance	382	393	473	493	801	866
d. Other intern personnel expenditures	263	279	313	418	396	572
f. External personnel expenditures	198	209	259	255	344	449
2 Material expenditures	1,830	2,373	2,870	3,032	4,296	5,274
a . Domestic material expenditures	1,670	2,218	2,681	2,848	4,071	4,969
b . External material expenditures	160	155	189	184	225	305
3. Subsidies to autonomous regions	4,237	4,834	5,283	6,909	7,188	8,344
a. Personnel expenditures	3,961	4,520	4,906	6,575	6,756	7,863
b. Non personnel exp.	276	314	377	334	432	481
4. Interest and debts repayment	13,395	13,434	15,217	17,163	18,422	19,906
a. Internal debts	250	251	275	121	204	251
b. External debts	13,145	13,183	14,942	17,042	18,218	19,665
5. Others	3,483	1,484	1,195	2,041	204	3,645
Total Expenditures (IE)	29,998	30,227	34,031	40,290	43,179	52,541
Actual Routine Revenues (IR)	39,546	41,585	48,863	56,113	61,370	71,558
Govt. Saving (IR -IE)	9,548	11,358	14,832	15,823	18,191	19,017

APPENDIX A: TABLE 6 (Continued)

Types of expenditures	1990 / 1991	1991 / 1992	1992 / 1993	1993 / 1994	1994 / 1995	1995 / 1996
II. DEVELOPMENT EXPENDITURES						
1. Departments / Agencies	4,853	5,971	7,858	10,916	9,478	10,429
2. Development subsidies to villages	181	250	327	392	432	426
3. Development subsidies to regencies	392	583	825	916	2,554	2,518
4. Development subsidies to provinces	486	573	701	741	1,318	1,277
5. Investment through the banking system	323	470	150	380	205	80
6. Fertilizer subsidy	265	302	175	175	457	212
7. Construction of primary schools	374	522	655	595	538	498
8. Regional development construction	657	708	891	1,334	1,485	1,751
9. Sanitary facilities/public health center	193	269	320	340	-	-
10. Construction and development of markets	3	2	1	3	-	-
11. Replanting and afforestation	33	75	95	111	-	-
12. East Timor	-	-	-	-	397	485
13. Road facilities	679	972	1,225	1,084	-	-
14. Others	505	722	708	688	904	602
15. Aid projects	8,508	8,846	10,204	10,753	10,983	11,170
16. Reserves	2,000	1,500	-	-	-	-
Total Expenditures (IIE)	17,452	21,765	24,135	28,428	29,163	29,812
Actual Development Revenues (IIR)	9,905	10,409	11,098	10,753	10,983	11,170
Total Expenditures = IE +IIE = (IIIE)	47,450	50,492	58,166	68,718	72,342	82,353

APPENDIX A: TABLE 6 (Continued)

Types of expenditures	1990 / 1991	1991 / 1992	1992 / 1993	1993 / 1994	1994 / 1995	1995 / 1996
Total Actual Revenues = IR+IIR = (IIIR)	49,451	51,994	59,961	66,866	72,753	82,728
SAP = (IIIR - IIIE)	2,001	1,502	1,795	(1,852)	411	375
IR - IIIE +I.4b = Primary Surplus	5,491	4,527	5,914	4,558	7,450	8,860
IIR - Govt. Saving = Budget Deficit	7,457	10,407	9,303	12,605	10,972	10,795

Note: SAP = Excess of planned over actual budget
Source: BPS, various years.

APPENDIX A: TABLE 7

DEBT INDICATORS OF MEXICO, BRAZIL AND INDONESIA 1978-1985 (PERCENTAGE)

	1978	1980	1981	1982	1983	1984	1985
All short term and long term debt service share of GNP							
Mexico	12.0	14.1	15.5	24.8	17.4	13.9	11.8
Brazil	7.5	11.0	11.6	12.8	13.0	11.0	10.2
Indonesia	9.3	7.5	7.3	9.2	10.7	11.1	13.0
All short term and long term debt service as share of exports							
Mexico	105.8	103.6	117.1	138.9	80.8	69.0	66.5
Brazil	106.5	114.5	113.6	146.0	104.5	72.1	72.6
Indonesia	40.8	25.1	26.1	39.0	41.7	43.3	51.6
Public and private long-term debt service as share of exports							
Mexico	62.4	38.0	35.0	44.6	45.4	49.2	48.2
Brazil	57.6	56.4	56.8	71.7	46.2	34.1	34.9
Indonesia	25.0	12.7	12.9	16.5	18.4	19.0	25.2
Proportion of debt that is short term							
Mexico	14.0	28.3	32.1	30.5	11.1	6.8	5.8
Brazil	13.2	19.3	19.2	19.3	14.9	11.6	10.8
Indonesia	9.9	13.3	14.4	18.1	15.6	16.8	14.8
Proportion of publicly guaranteed long-term debt with variable rate							
Mexico	59.50	71.5	75.4	76.7	82.7	83.6	80.1
Brazil	56.8	61.0	67.1	69.3	70.1	73.1	71.5
Indonesia	15.0	16.2	17.8	20.0	22.8	23.7	21.7
Effective interest rate for all long term debt							
Mexico	23.4	22.8	20.1	20.8	15.9	18.0	16.1
Brazil	18.0	23.3	23.7	23.0	13.9	11.7	11.2
Indonesia	17.5	15.5	16.6	16.1	14.6	15.8	16.6

Source: Woo, Glassburner and Nasution, 1994, p.125.

APPENDIX B

IMF DATA

APPENDIX B: TABLE 1

IMF FACILITIES

	For low income countries = concessional facilities	For middle and high income countries = regular facilities	Other = special facilities
1	Structural adjustment facility *set up in March 1986.	Stand-by arrangement *covers period 1 to 2 years *focus on macroeconomic policies aimed at overcoming balance of payments (bop) difficulties. Also include policies to address structural and supply-side weakness. This focus is not as strong as in extended arrangements. *most performance criteria to assess policy implementation - such as budgetary and credit ceilings, reserve and extended debt targets and avoidance of restrictions on current account payments and transfers-are applied. *repurchases 31/4 to 5 years.	Examples: buffer stock, compensatory financing, extended fund oil facilities and, the latest, for transition economies.
2	Extended structural adjustment facility *set up in December 1987.	Extended fund facility *covers period 3 to 4 years, aimed at overcoming bop difficulties stemming from macroeconomic and structural problems. *repurchases 41/2 to 10 years.	
Note	1 and 2 are loans with interest rates 0.5% Repayments are made in 51/2 to 10 years	Resources are available on market-related terms, a member purchases usable (hard) currencies with its own domestic currency. A member country repays the IMF by repurchasing its own currency with currencies acceptable to the IMF (U.S. dollar, after the Mexico crisis 1995 - 1996)	In response to members' special needs. Members cannot finance the same balance of payments needs under both regular and special facilities.

Note:1. Members can not finance the same BOP needs under both regular and special facilities.

2. The maximum combined amount available through General Arrangements to Borrow and New Arrangements to Borrow after the 1995-1996 Mexico crisis is SDR 34 billion or about $48 billion (The World Bank, 1997, p.17).

3. For more historical details on the IMF regular facilities see Harper, 1994.

Source: Schadler, 1995, p.3.

APPENDIX B: TABLE 2

SUCCESS RECORDS OF THE IMF STABILIZATION PROGRAM[1]

Number of arrangements / rescheduling	Number of countries[2]	Progress
More than one	Almost half	- return to their previous policies (few countries) - slow adjustment (most countries) - still weak macroeconomic setting - improved fiscal deficits (but overall high deficits because of heavy debt service burden) - stable (but at low rates) of growth, investment and saving - inflation increase sharply (many countries) - reserves steady at 3 to 4 months of imports - external position supported by substantial debt relief (increase in arrears for some cases) - further debt relief from IMF was a key incentive
Only one	Six	- benefitted from debt-rescheduling (four countries) - reduction in current deficits - reserves rebuilding - strong recovery of national output - need further adjustment for unsustainable debt-service ratios - edging up of inflation - high and rising fiscal deficits
	All	- structural problem: * inefficient state enterprises * slow in privatization and in financial system improvement - need improvement: * prudential standards * bank supervision

Note:

1. Based on experiences of 36 countries from mid-1998 to mid-1991
2. The number of countries seeking for conditional assistance from the IMF was 19 in 1970s, 39 during the first half of 1980s and 44 during the second half. In 1990s, the number is higher than the 1980s including countries in eastern Europe and countries of former Soviet Union.

Sources: Schadler, 1995, pp.33 - 34; Kildegrand, 1997, Alawode, 1997.

APPENDIX C

VARIABLES AND PARAMETERS

APPENDIX C: TABLE 1

EXOGENOUS VARIABLES

Note:

i, j	(Sector) appear in equations (in Chapter IV)
$\overline{PWM}$	is written as PWMbar in the program (Appendix D.1)

Variables	Description	Measurement
dDC	Changes in Domestic credit creation	Rp Billion
dNFA	Changes in net foreign assets	Rp Billion
$\overline{dPWM}$	Changes in world price of imports	Ones
ER	Exchange rate	Ones
FDEBT	Firm/Private debt	Rp Billion
FDS	Firms (Private) debt services	Rp Billion
FPRINCPL	Payment on principal loans by firm	Rp Billion
GDS	Government debt services	Rp Billion
GNPlag	Gross national product, previous year	Rp Billion
GPIlag	Previous year general price index	Ones
GPRINCPL	Payment on principal loans by government	Rp Billion
GTF	Government transfer to firm	Rp Billion
GTG	Government transfer to government	Rp Billion
GTH	Government transfer to households	Rp Billion
HTH	Transfer from household to household	Rp Billion
HTROW	Transfer from household to ROW	Rp Billion
LST	Total labor supply	Persons
MSlag	Supply of money a year before	Rp Billion
NIR0	Adjusting nominal interest rate	Percentage
$\overline{PWM}$	World prices of imported commodity	Ones
$\overline{PWX}$	World prices of exported commodity	Ones
Qlag	Previous domestic output	Rp Billion
RIRF	Real interest rate (foreign)	Percentage
ROWINV	ROW investment (foreign direct investment, portfolio investment)	Rp Billion
ROWTF	ROW transfer to firm	Rp Billion
ROWTG	ROW transfer to government (grant)	Rp Billion
ROWTH	ROW transfer to households	Rp Billion
ROWTR	Total ROW transfer	Rp Billion
$\overline{WLG}$	Average wage rate of civil servants	Rp Thousand

APPENDIX C: TABLE 2

ENDOGENOUS VARIABLES

Note:
i, j (Sector) appear in equations

Variables	Description	Measurement
CAB	Current account balance	Rp Billion
CHS	Changes in stock	Rp Billion
DDIN	Demand for domestic intermediate goods	Rp Billion
DD	Total demand for domestic goods	Rp Billion
DER	Changes in exchange rate	Ones
dHPM	Changes in high power money	Rp Billion
DIN	Demand for composite intermediate goods	Rp Billion
DMIN	Demand for imported intermediate goods	Rp Billion
DOMINF	Domestic inflation rate	Ones
DRER	Changes in real exchange rate	Ones
DS	Sectoral domestic sales	Rp Billion
ERE	Effective real exchange rate	Ones
FEXP	Firm total expenditures	Rp Billion
FS	Firm saving	Rp Billion
FTF	Transfer from firm to firm	Rp Billion
FTH	Profits distributed to domestic households	Rp Billion
FTX	Firm income tax rate	Percentage
FY	Firm income	Rp Billion
FYD	Firm disposable income	Rp Billion
GBC	Government borrowing from commercial institution (non IGGI)	Rp Billion
GC	Government demand for domestic goods and for imported goods	Rp Billion
GCD	Government current expenditures on domestic goods	Rp Billion
GCM	Government current expenditures on imported goods	Rp Billion
GDE	Government development expenditure	Rp Billion
GDEBT	Government/public debt	Rp Billion
GDevR	Government development revenues	Rp Billion
GDP	Gross domestic product	Rp Billion
GDR	Government domestic revenue	Rp Billion
GDS	Government debt services	Rp Billion

APPENDIX C: TABLE 2 (Continued)

Variables	Description	Measurement
GNP	Gross national product	Rp Billion
GPI	General price index	Ones
GR	Government (total) revenue	Rp Billion
GRE	Government routine expenditure	Rp Billion
GROWTH	Productivity growth	Percentage
GS	Government saving	Rp Billion
HCD	Household consumption expenditures on domestic goods	Rp Billion
HCM	Household consumption expenditures on imported goods	Rp Billion
HExp	Households expenditures	Rp Billion
HS	Household saving	Rp Billion
HY	Total household income	Rp Billion
HYH	Household income	Rp Billion
HYD	Disposable household income	Rp Billion
IGGI	Private investment on domestic goods	Rp Billion
IT	Total investment on composite goods	Rp Billion
ITD	Total investment on domestic goods	Rp Billion
ITM	Total investment on imported goods	Rp Billion
KD	Sectoral capital demand	Rp Billion
KST	Total capital Supply	Rp Billion
LD	Labor demand	Persons
LDIS	Labor demand by industry per skill category	Persons
LDS	Labor demand by skill category	Persons
LS	Sectoral labor suply	Persons
MD	Total import demand	Rp Billion
MGS	Import of goods and services	Rp Billion
MOD	Demand of money	Rp Billion
MOS	Supply of money	Rp Billion
MT	Trade and transport margins	Rp Billion
MTD	Domestic trade and transport margins	Rp Billion
MTDRW	Domestic trade and transport margins	Rp Billion
MTTD	Domestic trade and transport margins	Rp Billion
MTM	Imported trade and transport margins	Rp Billion
MTMRW	Imported trade and transport margins	Rp Billion
NFD	Net final demand	Rp Billion
NEWDEBT	Total new debts for the year	Rp Billion
NIR	Nominal interest rate	Percentage
PC	Composite price	Ones

APPENDIX C: TABLE 2 (Continued)

Variables	Description	Measurement
PD	Domestic price	Ones
PK	Capital price	Rp Thousand
PM	Import price in domestic currency (rupiahs)	Ones
PN	Net price	Ones
PQ	Price for domestic and exported commodities	Ones
PRIMS	Primary surplus/deficit	Ones
PRINCPLT	Total payment of principal loans	Rp Billion
PX	Export price in domestic currency (rupiah)	Ones
Q	Sectoral domestic output	Rp Billion
QC	Sectoral composite commodity	Rp Billion
RER	Real exchange rate	Ones
RIR	Real rate of interest (domestic)	Percentage
RK	Rental price of capital	Ones
ROWASSET	ROW assets	Rp Billion
ROWSV	ROW saving	Rp Billion
ROWFAC	Net factor payments to ROW	Rp Billion
ROWSV	ROW saving	Rp Billion
ROWTR	Total ROW transfer	Rp Billion
TF	Direct tax revenue from firm	Rp Billion
TH	Direct tax revenue from households	Rp Billion
TI	Sectoral indirect tax revenue all comm.	Rp Billion
TID	Sectoral indirect tax revenue on domestic comm.	Rp Billion
TIM	Indirect tax revenue imported comm.	Rp Billion
TISUM	Total indirect tax revenue all comm.	Rp Billion
TRANS	Transportation margin	Rp Billion
TRANSD	Transportation margin on domestic commodity	Rp Billion
TRANSDRW	Transportation margin on domestic commodity	Rp Billion
TRANSM	Transportation margin on imported commodity	Rp Billion
TRANSMRW	Transportation margin on imported commodity	Rp Billion
TRB	Trade balance	Rp Billion
UNEMP1	Unemployment	Persons
UNEMP2	Unemployment	Percentage
VA	Sectoral value added/Value added production function	Rp Billion
WLH	Composite wage rate paid to households	Rp Thousand
WL	Composite wage rate by industry	Rp Thousand
WLS	Sectoral wage rate	Rp Thousand
XSD	Sectoral export supply of domestic product (Transformability of product supply)	Rp Billion

APPENDIX C: TABLE 2 (Continued)

Variables	Description	Measurement
YK	Capital income	Rp Billion
YKF	Firm capital income	Rp Billion
YKG	Government capital income	Rp Billion
YKH	Household capital income	Rp Billion
YKTROW	Total capital incomes sent to ROW	Rp Billion
YL	Labor income	Rp Billion
YLH	Household labor income	Rp Billion
YLS	Labor income by skill category	Rp Billion

APPENDIX C: TABLE 3

PARAMETERS

Parameter	Description
α_{oi}	Value added requirement per unit of output
α_{ji}	Intermediate input requirement per unit of output
α^{K}	Labor share parameter in production function
α^{kf}	capital income share of firm
α^{kg}	capital income share of government
α^{kh}	capital income share of households
α_1^{MOD}	elasticities of real money balances to real income
α_2^{MOD}	elasticities of real money balances to nominal to interest rate
α^{row}	capital income share of ROW
α^{L}	Labor share parameter in production function
a_1^{hs}	Elasticity of saving to interest rates and disposable income (household)
α_2^{hs}	Constant term in saving function
α_1^{ip}	Slope coefficient in total value added (GDP) in investment on domestic product function
α_2^{ip}	Constant term in investment on domestic product function
ginv	government investment multiplier
ftx	Firm income tax rate
htx	Household income tax rate
idx	Sectoral indirect business tax rate
mm	Real money balance multiplier
mtdr	Sectoral rate of trade and transportation margins on domestic commodity
mtmr	Sectoral rate of trade and transportation margins on Imported commodity
Sig	Sectoral share of government consumption
Sih	Sectoral share of household consumption

APPENDIX C: TABLE 3 (Continued)

Parameter	Description
Sij	Sectoral share of government investment
timr	Sectoral tax rate on imported commodity
txk	capital income tax rate
txl	Labor income tax rate
φ_{ji}^{DIN}	Intermediate input demand efficiency parameter
δ_{ji}^{DIN}	CES intermediate input demand function share parameter
ρ_i^{DIN}	CES function exponent for intermediate demand
σ_i^{DIN}	Elasticity of substitution for intermediate demand
φ_i^M	CES import demand function shift parameter
δ_i^M	CES import demand function share parameter
σ_i^M	Elasticity of substitution for imported commodity demand
ρ_i^M	CES import demand function exponent
φ_i^S	Supply function shift parameter
δ_i^S	CET function share parameter
ρ_i^S	CET function exponent
σ_i^S	Elasticity of transformation

APPENDIX D

MAIN PROGRAM AND NON CALIBRATED PARAMETERS

APPENDIX D.1

CGE MODEL FOR INDONESIA
MAIN PROGRAM

```
/* ----------production function ---------- */
vf[1:22,1]=Q - PhiLK.*((deltaLK.*LD.^RhoLK+((1-deltaLK).*KD.^RhoLK)).^(1/RhoLK));
/*----------production fn in the long run----------*/
/*vf[1:22,1]=Q - agi*GINV^RhoLK.*((deltaLK.*LD.^RhoLK+((1-deltaLK).*KD.^RhoLK)).^(1/RhoLK));
*/

vf[23:44,1]=DS - MGS.*((((1-deltaM)./deltaM).*(PM./PD)).^(1/(1- RhoM)));

/*----------Intermediate Inputs----------*/
vf[45:66,1]=DIN - alphaDIN.*Q;
vf[67:88,1]=DMIN - DDIN.*(((deltaDIN./(1-deltaDIN)).*(PD./PM)).^(1/(1-RhoDIN)));

/*----------Factors of Production: Labor----------*/
vf[89,1]=GPI - sumc((HC+GC)/sumc(HC+GC).*PC);
vf[90:111,1]=WL - GPI.*(1+CPQ).*ALPHAWL.*((1+(DS./LD)).^2);
/*Thorbecke, 1992, p.228*/
vf[112:133,1]=LD - ALPHAL.*(PN.*Q*1000000)./WL;
/*Based on level 2 prod. fn, Cobb Douglass*/
vf[134,1]=LDT - SUMC(LD);
vf[135,1]=LST - LDT - UNEMP1; /* LABOR market equilibrium*/
vf[136,1]=UNEMP2 - 100*UNEMP1/LST;

/*----------Factors of Production: Capital----------*/
vf[137:158,1]=RK - alphaK.*(PN.*Q*1000000)./KD;
vf[159,1]=KST-SUMC(/*KD=*/0.09*Q);
/* CAPITAL market equilibrium*/

/* ----------value added production function ---------- */
vf[160:181,1]=VA - alphaVA.*Q; /*level 1, Leontief*/
vf[182:203,1]=VAL - WL.*LD/1000000;
vf[204:225,1]=VAK - RK.*KD/1000000;

/*----------Household Incomes and Expenditures----------*/
vf[226,1]=HY - (sumc(VAL)+akh*sumc(VAK)+HTH+FTH+GTH+ROWTH);
vf[227,1]=HYD - (1 - htx)*HY;
vf[228,1]=HCT - (HYD - HS - HTH);
vf[229:250,1]=PC.*HC - Sih*HCT;

/*----------Firm Incomes and Expenditures----------*/
vf[251,1]=FY - (akf*sumc(VAK)+FTF+GTF+ROWTF);
vf[252,1]=FYD - (1 - ftx)*FY;

/*----------Government Incomes----------*/
vf[253,1]=GDR - (akg*sumc(VAK)+GTG+htx*HY+ftx*FY+TISUM+ROWTG);
```

```
vf[254:275,1]=TID - idx.*(PD.*DS+(ER*PWXbar).* XSD);
vf[276:297,1]=TIM - timr.*((ER*PWMbar).* MGS);
vf[298,1]=TISUM - sumc(TID + TIM) ;

/*----------Government Expenditures----------*/
vf[299,1]=GRE - (GTH+GTF+GTG+GCT+ER*GDS);
vf[300,1]=GCT - WLG - GCONS;
vf[301:322,1]=PC.*GC - Sig*GCT;

/*----------Primary Surplus/Deficit----------*/
vf[323,1]=PRIMS - (htx*HY+ftx*FY+TISUM - ER*GPRINCPL- GRE + ER*GDS);
vf[324,1]=GDEBT - 0.7*GS;

/*----------Saving----------*/
vf[325,1]=HS - alpha1hs.*(HYD*(1+NIR).^alpha2hs);
vf[326,1]=FS - (FYD-(FTF+FTH+FDS));
vf[327,1]=GS - (GDR - GRE);

/*----------Investment by origin----------*/
/*Investment by government*/
vf[328,1]=GINV - (GS + GDEBT - ER*GPRINCPL- SUMC(CHS) - ER*RESV);
vf[329:350,1]=IBG - SIJ.*PC*GINV;
/*SIJ is assumed, // needed infrastructure*/
/*Investment by private sector*/
vf[351:372,1]=IBF - alpha1ip.*((GDP/(1+NIR)).^alpha2ip);
vf[373:394,1]=IT - IBG - IBF;

/*Saving - Investment Balance*/
vf[395,1]=ROWSV - (SUMC(IT) - HS - FS - GS);
/*(SUMC(IBF)*PK+SUMC(IBG) - HS - FS - GS); */

/*----------Rest of the world Accounts----------*/
/*1. Trade Balance*/
vf[396:417,1]=MGS - (DIN+HC+GC+IT+XSD - Q - CHS - TID - TIM);
vf[418:439, 1]=XSD - DS.*(((DELTAS./(1- DELTAS)).*PD./PX).^(1/(1 - RhoS)));
vf[440,1]=TRB - ER*sumc(PWXbar.*XSD - PWMbar.*MGS);

/*2. Current Account Balance*/
vf[441,1]=CAB - (TRB - ER*GDS - ER*FDS - ROWFAC + ROWTR);
vf[442,1]=ROWFAC - (akrow*sumc(VAK) - YKFROW);
vf[443,1]=ROWTR - (ROWTH + ROWTF + ROWTG);

/*3. Capital Account*/
vf[444,1]=PRINCPLT - ER*(GPRINCPL + FPRINCPL);
vf[445,1]=ROWASSET - (PRINCPLT - CAB);

/*4. Balance of Payments*/
vf[446,1]=BOP - (FDEBT+GDEBT + ROWINV - ROWASSET);

/*----------Prices----------*/
vf[447:468,1]=PX - ER*PWXbar./(1+idx+mtdr);
vf[469:490,1]=PQ - (PC.*(DIN+HC+GC+IT)+PX.*XSD - PC.*CHS - PM.*MGS - TID - TIM)./Q;
vf[491:512,1]=PN - (PQ - alphaDIN.*PC);
```

```
vf[513:534,1]=PM - ER*PWMbar.*(1+timr+mtmr);
vf[535,1]=PK - sumc((IT/sumc(IT)).*PC);
vf[536:556,1]=DF*(PC.*QC - (PD.*DS+PM.*MGS));

/*----------monetary----------*/
vf[557,1]=MOD/GPI - mm*(((GNP/GPI)^1.2711)*EXP(-.005575*NIR));
vf[558,1]=MOS - (MSlag + dDC - BOP);    /*23819*/
/*deficit is financed by high-powered money and a creation of domestic credit*/
vf[559,1]=MOS - MOD; /*money market equilibrium*/

/*----------Inflation Rates----------*/
vf[560,1]=DOMINF - (GPI - 1)/1; /*1 = GPIlag*/

/*----------Exchange Rates----------*/
vf[561,1]=dER - (ER - 1.0);
vf[562,1]=dRER - (dPWMbar + dER0 -dER); /*Relative version of PPP*/

/*----------Interest Rates----------*/
vf[563,1]=NIR - (RIRF+dRER+ DOMINF+NIR0) ; /*Ahmed and Chhibber, 1989, p.33*/
/*RIR=1/h*(k*GNP - MOS/GPI), LM curve*/

/*----------GNP, Growth and Absorption----------*/
vf[564,1]=GNP - SUMC(VAL+VAK+TID+TIM) + ROWFAC;
vf[565,1]=GROWTH - 100*(GNP - GNPlag)/GNPlag;


/*----------*/
```

APPENDIX D.2

VALUES OF THE PARAMETERS THAT ARE NOT CALIBRATED

Elasticities of Substitution (Lee, 1993, p.76): in equations 4.1 , 4.3 and 4.5.*

1.42	0.5	0.5	3.55	3.55
3.55	3.55	3.55	2	2
2	2	2	2	2
2	2	2	2	2
2	2.			

Elasticities of Transformation (Lee, 1993, p.76): in equation 4.41.*

3.9	2.9	2.9	2.9	2.9
2.9	2.9	2.9	0.7	0.7
0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.7
0.7	0.7.			

Constant term in saving function: in equation 4.32:

$\alpha_2^{hs} = 2$

Constant term in investment on domestic product function: in equation 4.37:

$\alpha_2^{ip} = 2$

Note:

* Adjusted according to industry classification in the SAM

APPENDIX E

SIMULATION DATA

APPENDIX E: TABLE 1

NEW AND PREVIOUS INDIRECT TAX RATES ON DOMESTIC AND IMPORTED COMMODITIES (PERCENTAGE)

		Indirect tax rates (idx)		Import tax rates (timr)	
		Base run	Simulation	Base run	Simulation
1	Farm food crops	0.7058052	0.7	2.56945	2.5694
2	Non food farm crops	0.8207179	0.820717	0.4643229	0.0
3	Livestock	0.9210154	0.921015	0.4331889	0.433188
4	Forestry and hunting	1.0154359	1.01543	0.2539683	0.00
5	Fishery	0.5066336	0.506633	1.1299435	1.12994
6	Non metallic mineral	0.7344092	0.734409	0.09869	0.0
7	Other mineral	1.9103356	1.91033	0.4420608	0.44206
8	Food, beverages and tobacco	8.3975979	8.39759	1.8869228	1.88692
9	Textile, apparel and leather	1.6580418	1.65804	3.5477893	3.54778
10	Wood and wood products, and construction	1.36895	1.36895	8.7310746	8.73107
11	Paper product	3.5120275	3.51202	9.4422106	9.44221
12	Chemicals, chemical products, petroleum refinery and basic metal	-1.1997368	-1.19973	4.6755809	4.67558
13	Electricity, gas and water supply	0.432746	0.432746	0.05	0.0
14	Wholesale and retail trade, transportation support and storage	8.1155033	8.1155	0.000004	0.0
15	Restaurant	4.338041	4.338	0	0.0
16	Lodging	4.2596614	4.25966	0	0.0
17	Land transport	1.6387982	1.63879	0	0.0
18	Water, air transport, and communication	0.8335892	0.833589	0	0.0

APPENDIX E: TABLE 1 (Continued)

		Indirect tax rates (idx)		Import tax rates (timr)	
		Base run	Simulation	Base run	Simulation
19	Bank and Insurance	0.8466473	0.84664	0	0.0
20	Real estate and services	4.8241898	4.82418	0.0017	0.0
21	Administration, defense, education, health, social services, film and recreation	1.0594648	1.05946	0.00441	0.0
22	Personal and household services	1.9840266	1.98402	1.291737	1.2917

APPENDIX E: TABLE 2

SECTORAL EXPORT SUPPLY (PERCENTAGE)

Sector	Base run	Devaluation	Liberalization	Austerity	Standard reform	Strategic reform
Farm food crops	0.43	0.13	0.42	0.42	0.42	0.42
Non food farm crops	2.04	0.66	2.04	2.03	2.04	2.03
Livestock	0.06	0.02	0.06	0.06	0.06	0.06
Forestry and hunting	0.17	0.05	0.17	0.17	0.17	0.17
Fishery	0.65	0.20	0.65	0.65	0.65	0.65
Non metallic mineral	24.90	77.05	24.90	24.92	24.96	24.97
Other mineral	0.15	0.05	0.15	0.15	0.15	0.15
Food, beverages and tobacco	7.63	2.35	7.63	7.63	7.64	7.63
Textile, apparel and leather	12.42	3.82	12.43	12.42	12.44	12.43
Wood and wood products and construction	11.20	3.44	11.20	11.20	11.20	11.20
Paper products	3.62	1.11	3.63	3.62	3.62	3.63
Chemicals, chemical products, petroleum refinery and basic metal	28.47	8.62	28.47	28.46	28.43	28.42
Electricity, gas and water supply	0.00	0.00	0.00	0.00	0.00	0.00
Wholesale and retail trade, others.	0.42	0.13	0.42	0.42	0.41	0.42
Restaurant	1.00	0.31	1.00	1.00	0.99	1.00
Lodging	1.09	0.33	1.09	1.09	1.09	1.09
Land transport	0.03	0.01	0.03	0.03	0.03	0.03
Water, air transport, and communication	1.64	0.51	1.64	1.64	1.64	1.64
Bank and Insurance	3.41	1.05	3.41	3.41	3.38	3.42

APPENDIX E: TABLE 2 (Continued)

Sector	Base run	Devaluation	Liberalization	Austerity	Standard reform	Strategic reform
Real estate and services	0.07	0.02	0.07	0.07	0.07	0.07
Social services, film and recreation	0.51	0.15	0.51	0.51	0.51	0.51
Personal and household services	0.10	(0.01)	0.10	0.12	0.09	0.08
	100	100	100	100	100	100

APPENDIX F

IRB FORM

APPENDIX F: TABLE 1

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

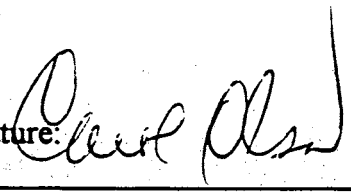
Date: 09-22-97 **IRB #: BU-98-003A**

Proposal Title: A COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR INDONESIA: IMPACTS OF STRATEGIC REFORM POLICIES

Principal Investigator(s): M.J. Applegate, Amanah Abdulkadir

Reviewed and Processed as: Continuation

Approval Status Recommended by Reviewer(s): Approved

Signature:  Date: September 3, 1998

Director of University Research Compliance
cc: Amanah Abdulkadir

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Amanah Abdulkadir

Candidate for the degree of

Doctor of Philosophy

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