ECONOMIC GROWTH AND DEVELOPMENT POLICY IN OIL DEPENDENT INDONESIA

M. Tasrif Arif [1] and Khalid Saeed [2]

ABSTRACT

This study uses a system dynamics model to understand the process of economic growth in the oil dependent economy of Indonesia. Many long-run growth patterns resulting from the various intuitively appealing development policies are analysed and an attempt is made to identify the best policy set for attaining a sustainable growth pattern. The study shows that influencing factor prices in a way to facilitate adoption of capital intensive technologies increases acceleration of growth and is a key policy to sustain growth in the long run.

1. INTRODUCTION

This paper examines the oil dependent economic growth in Indonesia over the past and explores development policy options to sustain growth over the next 50 years over which oil reserves are expected to be consumed. A generic system dynamics model is constructed to analyze the problems of transition from an oil-dependent economy to an independent one. The model is based on the macroeconomic growth principles, while it also incorporates the microeconomic market clearing mechanism. A set of simulations with this model is used to examine alternative policies for achieving a smooth transition from an oil-dependent economy to an oil-independent one.

A policy history analysis precedes policy analysis in this study. Such analysis improves confidence in the model and lends itself to acquiring a good understanding of the system under study. The policy design emphasis is also on influencing the day to day decisions of the participants in the system instead of intervening to fight internal trends. It is, therefore, necessary to concentrate on elucidating decision making process itself instead of simply using behavioral equations prescribed by the economic theory as is done in case of econometrics (Tomkins, 1981). Hence the model used is somewhat large. The general structure of this model is discussed in Section 4 of this paper. Further technical details and a machine readable listing of the model are available from the authors on request.

Development planning has traditionally required large scale interventions by the government. Many of such interventionist policies have been implemented in Indonesia

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1. Assistant Lecturer, Electrical Engineering Department, Bandung Institute of Technology, Bandung, Indonesia.
2. Associate Professor, Industrial Engineering & Management Division, Asian Institute of Technology, Bangkok, Thailand.

(Lewis, 1984). These include (1) increasing government spending, (2) encouraging investment, (3) controlling foreign trade, (4) subsidizing domestic consumption of oil, and (5) to some extent, controlling factor prices.

This study, however, suggests that, in some sense, non-intervention is the best policy. The tendency of the economy to maintain a sustained growth pattern appears to be facilitated by the flexibility of production technology and an unencumbered working of the market clearing mechanisms. Influencing factor prices in a way as to increase capital intensity further helps since it strengthens the accelerator mechanism and consequently also creates larger multiplier effects.

2. THE INDONESIAN ECONOMY: AN OVERVIEW

Under the so called New Order (which signifies the assumption of political power by the new regime after a military coup d'etat in 1965), the average rate of economic growth in Indonesia has been almost 8 percent over the period 1969-1981. This translates into a real per capita growth rate of over 5 percent (McCawley, 1983). As compared with per capita growth rate of -0.2 percent during the period 1960-1965 (the period of so called guided democracy), such a rate of economic growth is high, even by contemporary Asian standards, and much higher than that achieved in Western Europe during the nineteenth century or in Japan between 1867 and 1914 (Arndt, 1975).

This rapid growth has led many observers of the Indonesian economy to study the mechanisms of its growth during 1970s. It is generally believed that such rapid growth occurred largely because of revenues from export of oil. Indeed, petroleum and gas currently account for 75 percent of total exports and 60 percent of the government's budgetary outlays (Pitt, 1985).

Although energy consumption in Indonesia is low, even by developing country standards, it has grown very rapidly over the past decade. Commercial energy consumption grew at a rate of 14.7 percent per annum during 1972, which is among the fastest rates of growth in energy consumption in the world and is almost twice as fast as the GNP growth rate in Indonesia (Pitt, 1985). In absolute terms, domestic oil consumption accounted for about 124 million boe* in 1976 which was about 87 percent of the total commercial energy consumption (Energy Planning For Development in Indonesia, 1981).

Undoubtedly, a major factor behind the rapid growth in domestic oil consumption has been the subsidization policy of the government. Under the New Order, subsidies on the domestic sale of refined oil products have become a sizeable item in the State Budget since late 1970s. In the early 1970s, the price of domestic oil products was higher than what it cost to produce these (Dick, 1980).

* barrel oil equivalent

The increasing dependence of the economy on oil export revenues, however, must be viewed with some alarm since oil resources are finite and non-renewable. When oil runs out the economy might experience a sudden and deep recession before it can make a transition into an oil-independent state.

3. PAST BASIS OF DEVELOPMENT POLICY

It is widely recognized that if population is growing, real income must also grow. Its failure to do so, means a reduction in living standards to the point where the population ceases to grow (Hamberg, 1956). Thus, models of economic growth have become indispensable to designing strategies for the less developed countries. These models are further supplemented by the humanitarian concerns and moralization as bases for development policy. Unfortunately, the policies issued under such bases often require large scale government intervention into fighting the internal tendencies of complex social systems, which is often economically wasteful and politically dysfunctional (Saeed, 1985).

The relatively simple Harrod-Domar model which is best known among the various economic growth models, has been the main instrument of policymaking in the past. According to this model the basic remedy to the development problem is simply to increase resources to be invested. Two policy implications of this popular model have been to increase domestic savings and foreign aid (Bhagwati, 1984). However, a particularly crucial assumption of the Harrod-Domar growth model is that production takes place under fixed factor proportions. There is no possibility of substituting labor for capital in production (Solow, 1956). This assumption means that any excess of one or the other is wasted. This assumption is in conflict with the idea of clearing markets which is based on the notion that private markets function efficiently.

The idea of market clearing is also closely related to the optimizing behavior of individuals, although, within a bounded information set. People determine their individual choices of work, consumption, and so on, in order to make themselves as well off as possible. Market clearing also reflects the idea that the people who participate in and organize markets - and who are guided by the pursuit of their own interest - do not waste resources, and thereby end up achieving efficient outcomes (Barro, 1984). Last but not least, if policy intervention is to be indirect, it must aim at affecting the day to day decisions of the people, not the final outcome of those decisions. Thus, a policy model concerning economic growth must incorporate these day to day decisions which determine how markets are cleared.

4. A SYSTEM DYNAMICS MODEL OF ECONOMIC GROWTH IN AN OIL DEPENDENT ECONOMY

The main model of this study is a single sector two factor system which incorporates national income accounting at

an aggregate level and mechanisms to determine price level, wage rate, interest rate, and technological mix. To this is added an oil production and consumption system representing the oil sector of the economy.

Following are the key assumptions of the model:

1. There is only one non-oil commodity, whose rate of production depends on the potential production rate and the capacity utilization factor. Potential production rate is modeled as a function of capital and workers, whereas capacity utilization factor depends on the short run aggregate demand and inventory condition.

2. Inventory is introduced into the economic growth submodel as a level containing the physical accumulation of goods in the economy. It is increased through production and imports, and depleted through capital investment, government purchases, consumer purchases, and exports.

3. Excesses in inventory can be exported, while shortages in inventory can be met by imports. Volumes of both exports and imports can be controlled through specified policy instruments. There is no limitation outside of the country for exports and imports.

4. Financial markets are cleared through changes in real interest rate. Fractional gross profits, tax, propensity to consume, population growth rate, export price of oil, electricity price, coal price, and subsidy on domestic oil consumption are all exogenously determined depending on government policy. Government spending is also exogenously determined.

5. Desired oil exports are endogenously determined on basis of oil reserves and the need for oil revenues, but can be modulated by oil export policy.

6. Two main components of the oil submodel are the potential oil production and the desired oil production. Potential oil production is determined by capital stock in this sector and its productivity. The model considers capital as the sole production factor input for producing oil, since oil sector is highly capital intensive. Oil production is used for domestic consumption and exports. Revenues from oil exports are assumed to be used for importing goods into the economy.

The following subsections describe briefly the causal relationships incorporated in the model and growth patterns generated by simulating it.

4.1. Growth Mechanisms of the Model

The following well-known identity represents income

accounting in the model.

$$Y = C + I + G + (X - M) \quad (1)$$

where :

Y : income;
C : consumption;
I : investment;
G : government spending;
X : value of exports; and
M : value of imports.

The growth mechanisms are embodied in the feedback loops representing the multiplier-accelerator principle first propounded by Samuelson (Forrester, Nathan B. ,1982). However, instead of assuming presence of a market equilibrium all along the growth path, the model also incorporates the micro-level responses of the producers and consumers to changes in market conditions since market clearing is the natural macrocomplement to the microfoundations that underlie the model (Barro, 1984).

Figure 4.1 illustrates the main causal-loops of the economic growth submodel.

Income represents Gross National Product (GNP) at constant prices and is given by multiplying inventory outflow with equilibrium price. Inventory outflow constitutes consumer purchases, capital investment, government purchases, and net exports in terms of goods. When oil sector is also connected to this system, income is equal to inventory outflow times the equilibrium price plus domestic oil sales (in real terms).

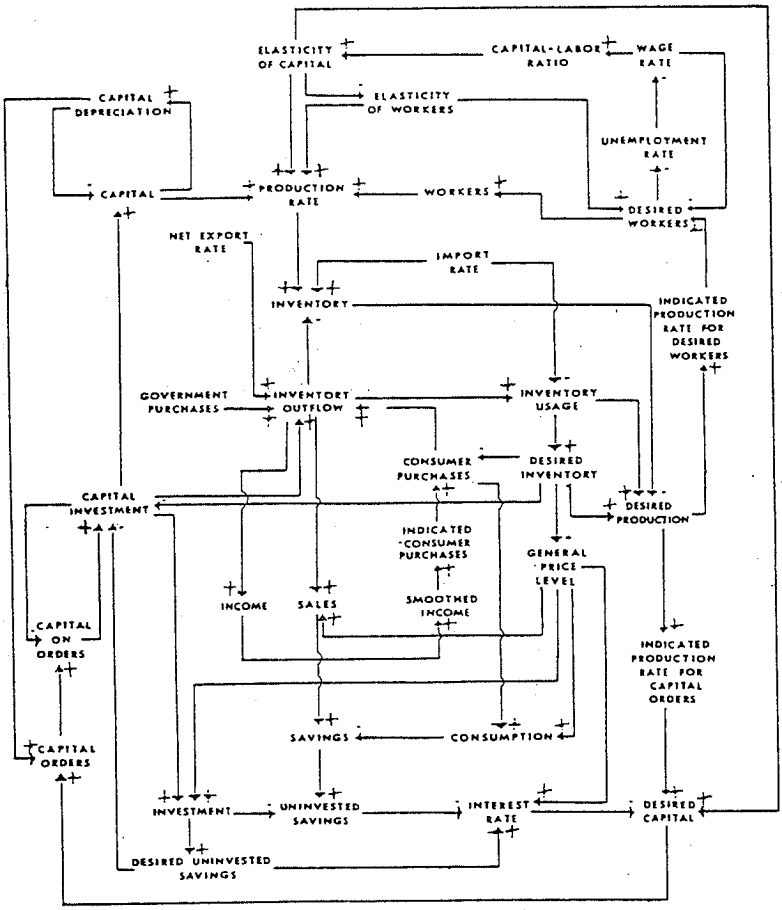

Fig. 4.1 Main Causal Loops in the Economic Growth Submodel

The multiplier is represented through a positive feedback loop which is coupled with a negative feedback loop, as seen in Figure 4.2.

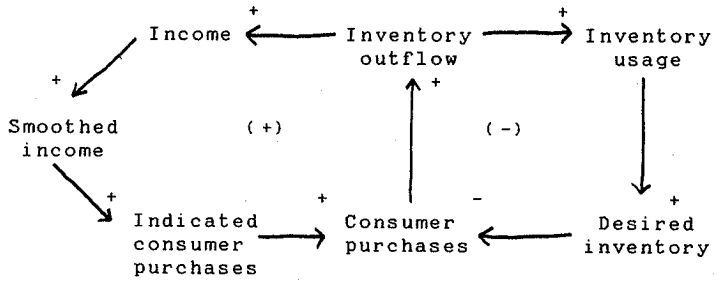

Fig. 4.2 The Multiplier Loop

The negative loop represents the effect of inventory availability on consumption. The effect of wage rate on consumption (as a budget constraint) is not considered.

The accelerator mechanism is represented through one main positive feedback loop which is coupled with three supplementary positive feedback loops, as seen in Figure 4.3. However, these positive feedback loops are coupled with several negative feedback loops which are created by the market clearing mechanisms.

Figure 4.4 shows the behavior of the model when it is disturbed from equilibrium by stepping up government purchases. In this experiment market is assumed to remain in equilibrium and population is kept fixed. Also, oil sector is kept out of the picture.

As seen in Figure 4.4, due to a step increase in government purchases, income rises, which increases consumption expenditure. Rising government purchases deplete the level of inventory while they increase the shipments. Together, these effects increase desired production, which fuels investment.

After some period of time as seen in Figure 4.4, income levels off at its new equilibrium which is higher than its initial value. Moreover, due to an increase in desired production in the face of a fixed population, the unemployment rate decreases to a lower value in the new equilibrium.

4.2 MARKET CLEARING MECHANISMS

Four market clearing mechanisms are built into the model. These are interest rate, general price level, wage rate, and technological mix indicated by the capital labor ratio. Interest rate balances investment and saving rates which are decoupled by a pool of uninvested savings. Uninvested savings, in excess of a level necessary to support desired investment at

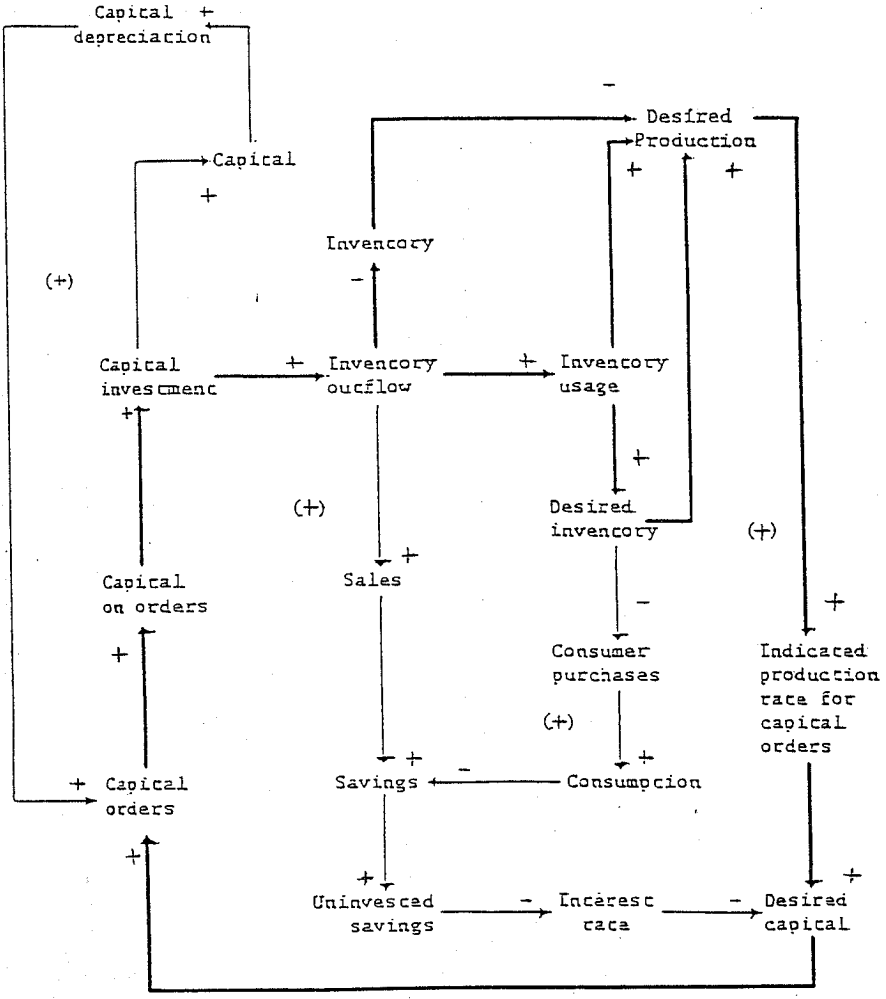

Fig. 4.3 The Accelerator Loop

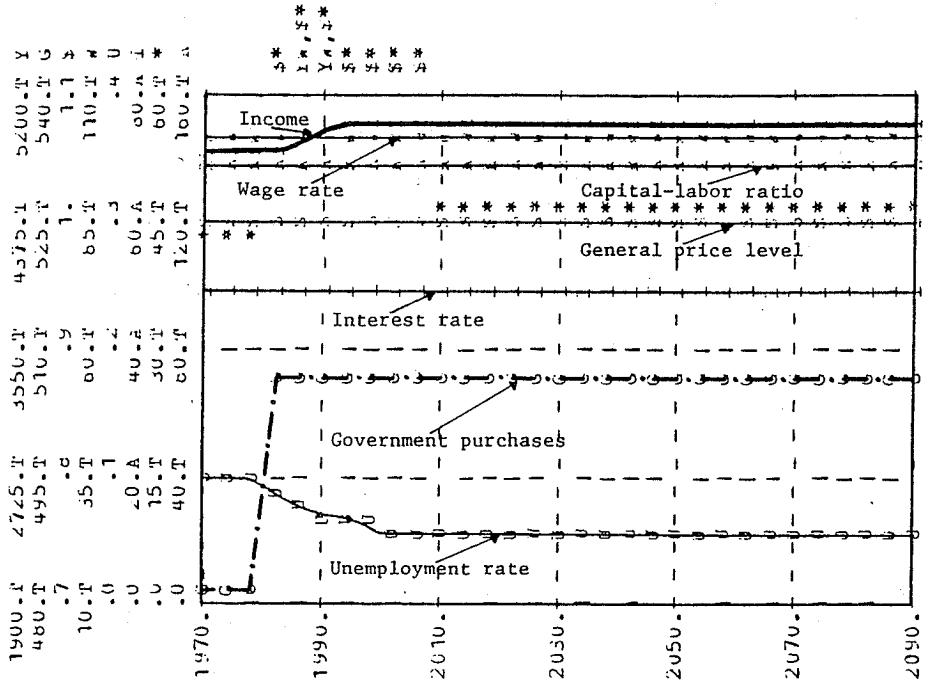

Fig. 4.4 Behavior of Economic Growth Submodel with Assumptions of Market Equilibrium and Fixed Population

current cost of capital, exerts a downward pressure on interest rate, which encourages further investment. Interest rate is also influenced by price. An increase in price raises money demand to support existing exchanges of goods which raises the interest rate.

General price level adjusts towards a desired level at which inventory is adequate to support shipments out of it while it affects sales, consumption, and investment.

Wage rate clears the labor market. An increase in the unemployment rate depresses wage rate. A depressed wage rate, in turn, will increase the demand for workers. Subsequent hiring of workers restores balance between workers and the unemployed.

Finally, the study also assumes that in the long run, the optimal technology mix can be adjusted by using relatively flexible production methods. This assumption allows for substituting workers for capital in production without compromising on production efficiency. The study assumes that the optimal capital-labor mix will rise when real wage rate is higher than the average value of the marginal productivity of

workers. Presence of such a technological flexibility, however, depends a lot on how the government deals with the import of technology. Thus, the process of clearing of the technology market can be considered as a policy variable.

Figure 4.5 shows the behavior of the model repeating the first experiment while the assumptions of fixity of price, interest rate, wage rate, and the optimal capital-labor ratio are relaxed. As seen in Figure 4.5, income rises, and levels off as in the first experiment. Price rises at first due to the inventory shortage, and then declines converging to its equilibrium value. This means that the price mechanism can balance supply and demand of goods. Wage rate also increases and levels off at a higher level as compared with its initial value. This increased wage rate is coterminus with a slight decline in the unemployment rate (not evident in the figure due to compression of scale).

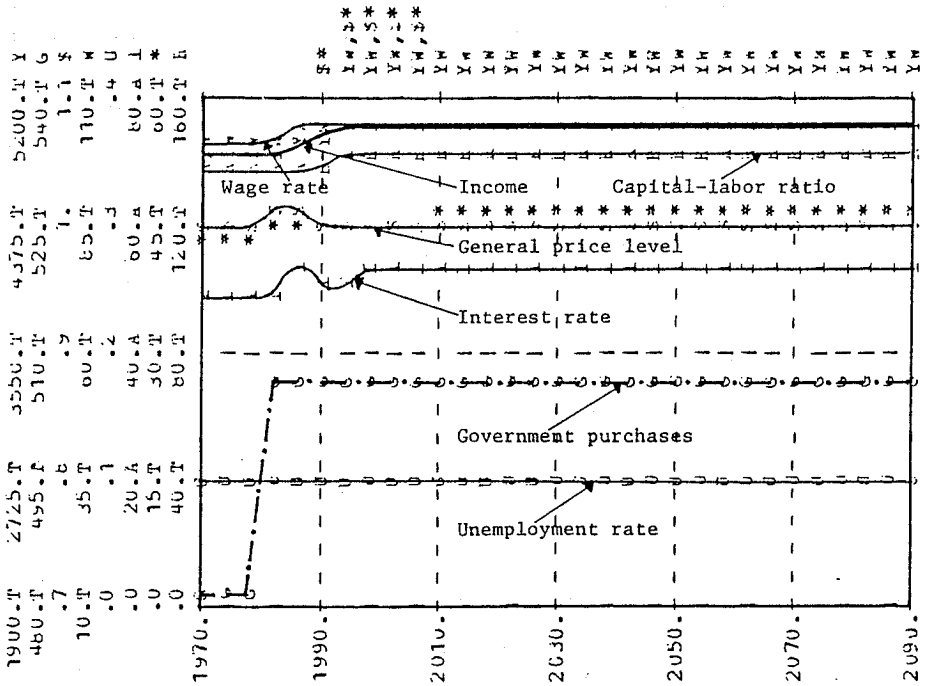

Fig. 4.5 Behavior of Economic Growth Submodel with Fixed Population but with Market Clearing Mechanisms Working

The increased wage rate raises the optimal capital-labor ratio, as seen in Figure 4.5. It means that the constant fraction of output accruing to capital is higher than its initial value. In other words, the economy becomes more capital intensive compared with the first experiment. Consequently, at the new equilibrium, the interest rate is higher than its normal value. It should be noted that the unemployment rate is lower than in the first experiment since increased capital intensity creates bigger acceleration and also raises subsequent multiplier effects.

4.3 POPULATION GROWTH

When population is allowed to grow exponentially and the increases are added to the pool of the unemployed, wage rate is depressed. This raises the demand for workers. When technological adjustments are possible, the reduced wage rate decreases the optimal capital-labor ratio, which further fuels worker hiring.

Figure 4.6 illustrates the model behavior repeating the

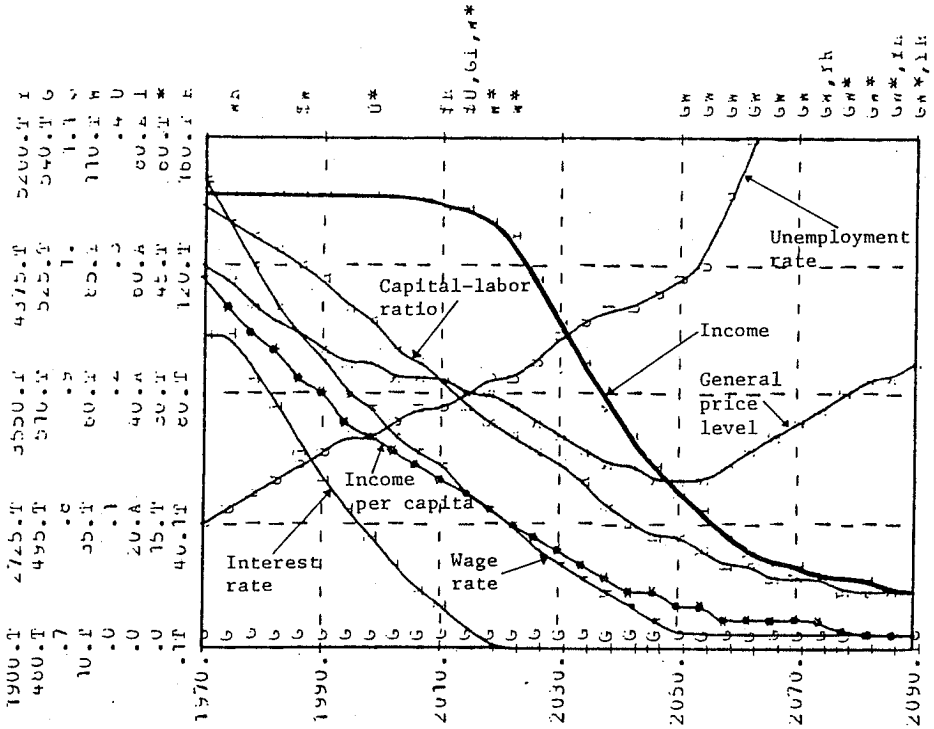

Fig. 4.6 Behavior of Economic Growth Submodel with Growing Population and with Market Clearing Mechanisms Working

second experiment, but without an exogenous step in government spending, while an exogenous population growth is also introduced. As described above, the rise in population raises the pool of workers, thus increasing production capacity. Increased production raises the level of inventory which depresses price level. This reduced price is also followed by a decline in interest rate since the investment rate is less than the saving rate. The excess supply and the lower level of capital-labor ratio do not encourage further investment. Therefore, more and more capital is substituted by labor. This also limits acceleration while multiplier effects and aggregate income decline. Thus, unemployment rate becomes high in spite of a low wage rate.

4.4 The Oil Submodel

The oil submodel determines potential oil production and desired oil production. The potential oil production is given by multiplying capital in the oil sector by the productivity of this capital. The oil capital increases through capital investment in this sector which is modeled as a function of desired oil production and the forecast oil productivity of capital. A decline in oil productivity raises the capital investment needed to produce the same amount of oil. This productivity, in turn, depends on the level of oil reserves. Figure 4.7 illustrates the main causal-loops of the oil submodel.

Desired oil production is the sum of desired oil production for domestic consumption and desired oil production for exports. Desired oil production for domestic consumption is determined through its forecast value. Desired oil production for exports is a function of the ratio of oil export revenues to income. When oil export revenues decline, there is a tendency to export more oil in order to offset the declining revenues and vice versa.

The domestic demand for oil is modelled as a function of income, population, and the relative domestic oil price which is oil price to the consumers divided by average energy price. The average energy price is an average of electricity, coal, and oil prices to consumer. The electricity and coal prices are determined exogenously.

Oil price to consumer is domestic oil price or oil export price (when oil import occurs) modulated by subsidy or tax. The domestic oil price adjusts to its indicated value which is a function of oil productivity of capital, life of oil capital, interest rate, and general price level.

Figure 4.8 shows the behavior of the model when the oil submodel is coupled with the economic growth submodel. This experiment also assumes government spending to be a fixed function of average income and allows population to grow. In this case, all market clearing mechanisms are assumed to be working.

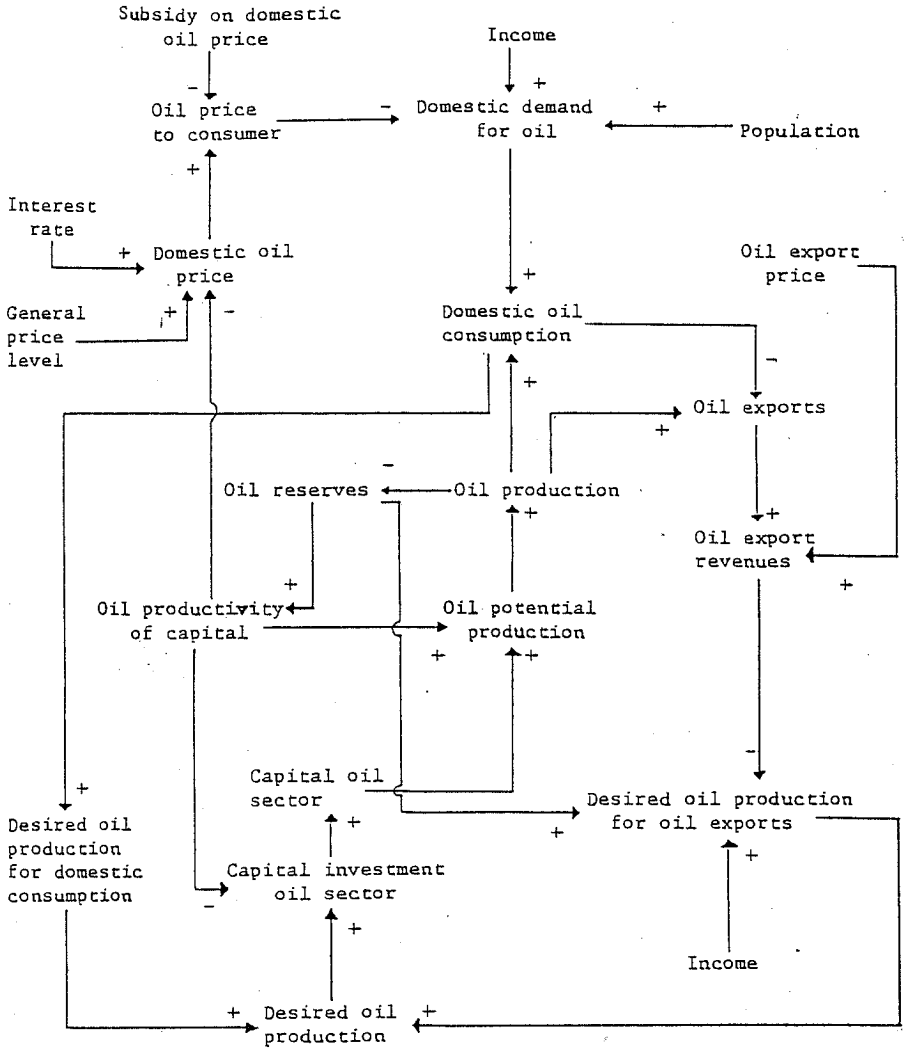

Fig. 4.7 Main Causal Loops in the Oil Submodel

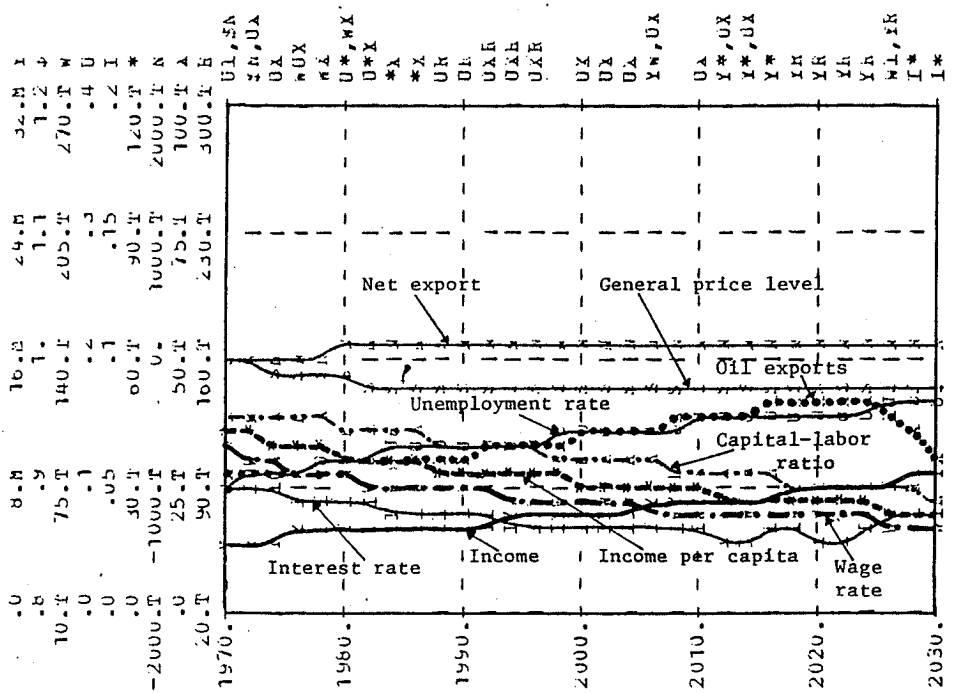

Fig. 4.8 Behavior of Complete Model Incorporating Economic Growth. Market Clearing, Population Growth and Oil Sectors

As seen in Figure 4.8, income grows, however, the income growth rate is less than the population growth rate. This is represented by a decline in income per capita throughout the simulation. General price level, interest rate, wage rate, and optimal capital labor-ratio are also depressed. Unemployment rate rises since the growth in income is unable to absorb the additional labor supply. Net exports are positive indicating that there is excess inventory. Propelled by the need to support higher outlays as income rises, oil exports rise but are limited by the declining oil reserves toward the end of the simulation.

5. THE SEARCH FOR AN APPROPRIATE GROWTH STRATEGY

Since different growth strategies may yield different growth patterns, the pattern of growth sought is the main basis in determining the alternative strategies of growth (Lewis, 1984).

The pattern being sought in our analysis is one which might overcome the problems of transition from an oil-dependent economy to an independent one. The appropriate strategy, in the long run, has to maintain a sustained growth and encourage the country to become self-reliant. It is also important that the instruments of change fall within the purview of a normal interventionist role of government and not call for suppressing laissez faire. Last but not least, these policies may not transfer costs of growth into the future. This form of intervention can be easily realized if the entry point for the government is the market. Examples of policies to influence market are establishment of a minimum wage rate for workers or a ceiling on interest rates (Herrick & Kindleberger, 1984).

We experimented with the following well known policies using the model to understand how they propagate through the system: (1) increasing government purchases, (2) encouraging investment through cutting taxes, (3) encouraging investment through increasing saving propensity, (4) restricting imports and expanding exports (trade policies), (5) supporting wage and interest rates, and (6) subsidizing domestic oil consumption. The policy of increasing government purchases is simulated by stepping up the fractional government purchases to 20 percent of average income as compared with 10 percent in the Base Run. The policy to encourage investment through tax cuts, is implemented through stepping down the fractional gross profits tax by 50 percent. The policy to encourage investment through increasing saving propensity, is implemented by reducing the propensity to consume by 10 percent. Trade policies include making the foreign trade respond faster to changes in excess inventory, introducing 10 percent positive non-oil exports, and doubling oil exports. Support of wage rate is implemented by holding it constant at initial value. Oil subsidy is simulated by stepping down the oil price to domestic consumers by 50 percent. This policy has been seen as one in which the poor benefit from the oil bonanza. However, several studies have suggested that it helps the higher income group considerably more (Down, 1983). The Base Run is made with fractional government purchases at 10 percent of average income, population growth rate at 2 percent per year, and absence of all development policies.

We also explored a set of policies which indirectly influence factor prices and technological mix. These include (1) stepping down interest rate normal (long-run interest rate) by 50 percent, (2) stepping up wage normal (long-run wage rate) by 50 percent, and (3) increasing gradually the goal of capital-labor ratio to be almost twice its initial value by 2030.

The simulation results are shown in the following tables giving the figures of income per capita, unemployment rate, value of net exports, and capital-labor ratio respectively in 2030. Those values in 1970 were respectively 43.82 thousand money units/year/million persons, 10 percent, nil, and 130.4 thousand capital units/million persons. This initial capital-labor ratio and other parameters, provide the elasticity of

capital of 0.17 and the elasticity of workers of 0.83. As compared with the US economy in which the elasticity of capital is 0.25 (Forrester, Nathan B., 1982), the Indonesian economy was more labor intensive in 1970.

Table 5.1 shows the simulation results of Base Run and six development policies mentioned above.

When development policies are absent (Base Run) the introduction of flexible interest rate and technology in addition to flexible prices and wages not only decreases income per capita, it also makes the system more labor intensive while increasing unemployment rate. When the indicated development policies are implemented, the presence of such flexibility improves behavior mainly for the first, the second, and the fourth policy, while it worsens behavior for the rest.

Apparently, the presence of such a flexibility in the face of population growth makes the system move toward greater labor intensity which is concommitant with a considerable weakening of the accelerator and multiplier effects. However, when demand is stimulated, the same flexibility allows capital intensity to increase which strengthens multiplier and accelerator effects.

It should be noted that stimulation of investment only at the cost of limiting demand greatly weakens the growth engine, while supporting wage rate also greatly discourages investment. Subsidization of domestic oil consumption produces results similar to the base runs while it also limits exports.

A comparison of the figures of Table 5.1 for the various computer runs shows that the capital intensity in the economy must rise for increasing its growth potential through multiplier and accelerator effects, while at the same time, demand must remain high to stimulate investment.

Table 5.2 shows the simulation results of selected policy runs when capital intensity is increased autonomously to almost twice its initial value in 1970. The policy of encouraging investment through tax cuts while allowing complete flexibility of the model gives best results since it generates highest multiplier and accelerator effects. Such a policy may also, in the long run, lead the country to self-reliance. On the other hand, the policy of increasing government purchases may create large deficits and trade policies may increase dependence on the international markets, even if they are able to create some propulsion in the economy.

An autonomous increase in capital intensity, may, however, be hard to realize unless mechanisms of intervention are identified. The following policy runs attempt to identify means of such intervention.

One way to increase capital intensity might be to influence prices of production factors. This can be done by keeping nominal interest rates at a low level and wage rate at a high level. Table 5.3 shows results of such strategies.

Table 5.1 Simulation Results of the First Policy Runs

Policy Run	Variable	Fixed technology & interest rate	Fixed technology only	Fixed interest rate only	All market clearing mechanisms working
Base Run	income/capita	36.12	34.26	19.00	23.90
	unemployment	0.13	0.13	0.19	0.16
	net exports	106.1	227.7	212.4	105.8
	capital-labor ratio	130.4	130.4	74.9	86.1
1. Increasing gov't purchases	income/capita	41.36	40.35	103.50	93.06
	unemployment	0.09	0.09	0.03	0.04
	net exports	-1142.0	-1088.0	-2156.0	-1776.0
	capital-labor ratio	130.4	130.4	315.8	290.1
2. Encouraging investment through tax cuts	income/capita	37.88	42.46	19.19	50.77
	unemployment	0.12	0.09	0.19	0.08
	net exports	-92.2	-480.1	209.6	-574.6
	capital-labor ratio	130.4	130.4	75.4	151.5
3. Encouraging investment through increasing saving propensity	income/capita	13.21	31.68	2.83	6.74
	unemployment	0.24	0.15	0.60	0.28
	net exports	555.9	577.7	126.7	285.1
	capital-labor ratio	130.4	130.4	28.3	40.3
4. Restricting imports and expanding exports	income/capita	40.68	40.24	109.50	97.92
	unemployment	0.10	0.10	0.03	0.03
	net exports	471.5	484.3	1506.0	1509.0
	capital-labor ratio	130.4	130.4	333.6	304.0
5. Supporting wage rate	income/capita	12.57	12.25	12.63	12.34
	unemployment	0.74	0.75	0.74	0.75
	net exports	-4.2	-1.2	-2.1	1.7
	capital-labor ratio	130.4	130.4	130.8	130.9
6. Subsidizing domestic oil consumption	income/capita	35.04	33.03	19.19	23.78
	unemployment	0.12	0.13	0.19	0.16
	net exports	-23.4	112.6	200.6	100.0
	capital-labor ratio	130.4	130.4	75.4	86.2

Table 5.2 Simulation Results of the Second Policy Runs

Policy Run	Variable	Full flexibility except for fixed interest rates	Full flexibility of market clearing mechanisms
Base Run	income per capita	62.85	60.29
	unemployment rate	0.07	0.08
	net exports	648.9	699.4
	capital-labor ratio	250.4	250.4
1. Increasing gov't purchases	income per capita	81.93	80.35
	unemployment rate	0.04	0.04
	net exports	-1775.0	-1585.0
	capital-labor ratio	250.4	250.4
2. Encouraging investment through tax cuts	income per capita	76.80	85.58
	unemployment rate	0.05	0.04
	net exports	-68.0	-706.0
	capital-labor ratio	250.4	250.4
3. Encouraging investment through increasing saving propensity	income per capita	27.99	50.20
	unemployment rate	0.18	0.11
	net exports	1052.0	1183.0
	capital-labor ratio	250.4	250.4
4. Restricting imports and expanding exports	income per capita	81.88	80.68
	unemployment rate	0.04	0.04
	net exports	1075.0	1179.0
	capital-labor ratio	250.4	250.4
5. Supporting wage rate	income per capita	63.89	57.55
	unemployment rate	0.01	0.03
	net exports	751.0	829.3
	capital-labor ratio	250.4	250.4
6. Subsidizing domestic oil consumption	income per capita	58.19	55.69
	unemployment rate	0.08	0.09
	net exports	508.2	531.8
	capital-labor ratio	250.4	250.4

Table 5.3 Simulation Results of the Third Policy Runs

Policy	Income per capita	Unemp-loyment rate	Net Exports	Capital-labor ratio
1. No intervention	23.48	0.20	105.6	88.2
2. Encouraging invest-ment through tax cuts	93.36	0.06	-1776.0	298.4
3. Encouraging invest-through increasing saving propensity	6.78	0.33	274.7	42.1
4. Restricting imports & expanding exports	98.50	0.05	1517.0	312.5
5. Supporting wage rate	9.74	0.87	1.9	203.4
6. Subsidizing domes-tic oil consumption	23.38	0.20	99.7	88.4

Deficit spending, export promotion and encouraging investment through tax cuts are indicated as best policies. The first two increase demand, while the third improves the ability to invest, although, as stated earlier, the first policy may create large national debt and the second may increase dependence on foreign markets in the long run. However, further helping to increase capital intensity through explicitly raising its ambient value may also propel demand.

Figure 5.1 shows the growth behavior when low interest rate and high wage policy is also coupled with increasing ambient capital labor ratio. Unemployment rate rises at first, however, afterwards it declines below its initial value. Income, income per capita, and wage rate rise steadily. When oil exports start to decline due to the exhaustion of oil reserves, interest rate rises to encourage savings in order to provide for the increased capital investment needed for supporting existing level of consumption. This set of policies appear to be the best for realizing self-reliant and sustainable growth.

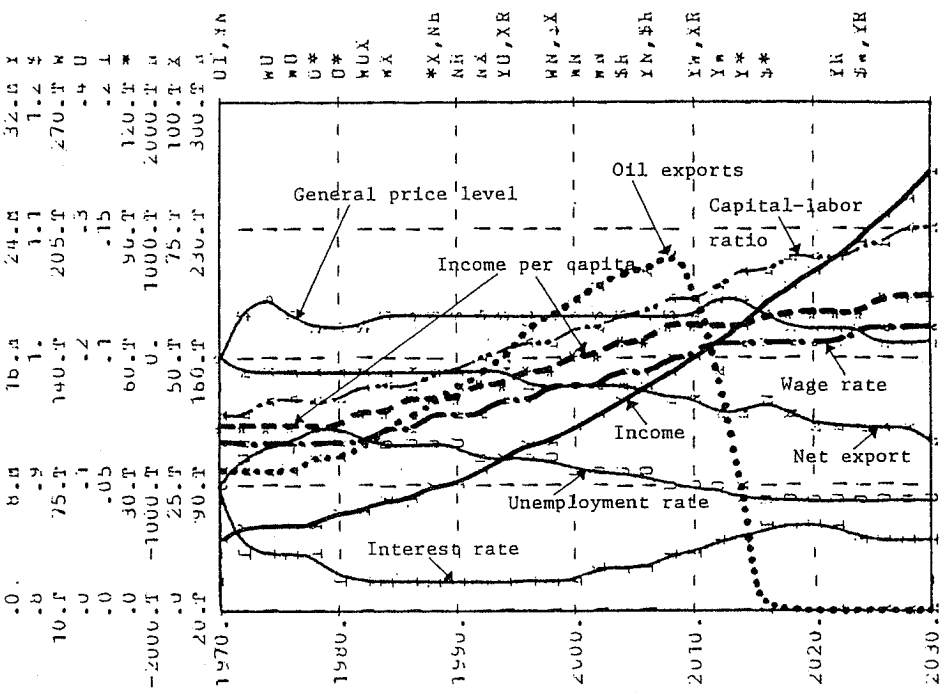

Fig. 5.1 Behavior of Complete Model with the Proposed Policy Set

6. CONCLUSIONS

This study has attempted to identify indirect instruments for attaining self-reliant and sustainable growth in the oil dependent economy of Indonesia. An important requirement of such an exercise is to incorporate into the model an appropriate "policy space." This meant that the market mechanisms which are to be influenced through indirect means were to be included.

The best policy set identified in this analysis aims at increasing multiplier effects and acceleration in the economy. This is possible by making sure that demand is not limited while a high degree of flexibility is maintained in the market. Also important is to increase capital intensity through influencing factor prices and having an explicit capital intensity goal instead of the existing tradition as a basis for determining appropriate factor proportions.

The results of this study are generalizable to some degree

and may hold true also for non-oil economies. The analysis shows that appropriate technology to be adopted by a developing nation may not acquiesce in existing labor availability but should take into account the growth patterns desired.

Although the suggested strategy seems to stimulate wage rate, the exact implications for income distribution have not been studied since the model is limited. A dual economy framework in which wages are determined through bargaining mechanisms has been suggested by Saeed (1983) for determining income distribution in agrarian economies. Such a framework appears quite appropriate for studying income distribution also in the industrial sector.

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