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The Impact of Government Expenditure on GDP, Employment and Private Investment a CGE Model Approach

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Abstract

The interaction of government expenditures with economic variables has been the subject of long debates between pros and cons in all major schools of Economics. According to Classical extremists, government expenditure has no effect on GDP due to complete crowding out between government expenditure and investment. This is vehemently rejected by radical Keynesians that assert a fiscal expansion policy affects GDP in full. In this paper we will study government expenditure effects on GDP and employment by a CGE model. It will be shown efficiency of government expenditure depends on kind of expenditure. The present paper divides government expenditures into two categories, consumption and investment expenditure. Also investment expenditure has been studied in five sectors: agricultural, gas and oil, construction, industry and mineral and service. The results confirm that government expenditure influences on economy in different ways, depends on types of costs. Increasing the government consumption expenditure causes reduction in production, employment and investment. Government investment expenditure has different effects on economy that depends on which area they will be spent.

Keywords: Government expenditure, GDP, Employment, Investment, CGE model.

1- Introduction

The government expenditures are amongst the most significant instruments of fiscal policies. For this reason, the interaction of government expenditures with economic variables has been the subject of long debates between pros and cons in all major schools of Economics.

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According to Classical extremists, government expenditure has no effect on GDP due to complete crowding out between government expenditure and investment. This is vehemently rejected by radical Keynesians that assert a fiscal expansion policy affects GDP in full.

Totally it expects an increase in government expenditure raises aggregate demand. So when demand is more than supply in economy, prices will increase and it makes a force for decreasing demand until economy stand on equilibrium point.

On the other way, in labor market if labor demand depends on nominal wags, demand function for labor is depend on nominal value of marginal product of labor. So if prices increase, demand for labor will rise and we will have an increase in nominal wages because of demand surplus. At least we will be in new equilibrium point in labor market.

In addition, there is an other viewpoint about government expenditure effects. If government expenditure acts as a complementary effect for private investment, we can expect an increase in government expenditure will make a growth in production and employment.

In this paper we will study government expenditure effects on GDP and employment. The new opinion that will be studied here is efficiency of government expenditure depends on kind of expenditure. The present dissertation divides government expenditures into two categories, consumption and investment expenditure, where the latter has been studied in five sectors: agricultural, gas and oil, construction, industry and mineral and service.

2-Methodology

We use a CGE models approach for studying government expenditure effects.

Whereas variation of aggregate demand and labor demand are in different markets, it seems using a systemic model that can show variation and adjustment of applying a policy through a system, is more suitable.

Computable General Equilibrium Models (CGE) has been used extensively since late 1970s as policy analyzing models. These models which are so flexible, are deterministic and regarding Walras rule in markets have great ability to include different economic issues .These models are used in expansive range of policy concepts such as

choosing developing strategy, income distribution, trade policies, structural changes, foreign shocks, tax policies and long run growth in developed and developing countries.

The great advantage of the approach is that it lets economists to investigate and analyze the effects of policy changes or exogenous factors changes through the system which is connected to entire economic sectors and the whole world. In comparison with econometric models, the remarkable advantage of computable general equilibrium models is their independence to time series data. In addition, strong microeconomic frame work of computable general equilibrium models which describes the optimization behavior of economic factors completely lets these models have more powerful analyzing bases; hence, not only are they preferred to econometric models, but they are also preferred to input-output models.

In computable general equilibrium models ,different economic sectors are being investigated .The expansion of range which includes sectors , is referred to type of study and analyzing policy effects .In order to evaluate economic sectors , we are able to investigate the impacts of projects and different policies in an area ,or in a country or in the whole world.

Computable general equilibrium models define a set of institutions (households, firms, sectors, government or the whole world) and a set of markets, and then, assured of considering definitions of macroeconomic standard, a set of supply and demand relationships for each market are defined.

It is necessary to attend that generating relationships in CGE models is based on the assumption of consumer and producer optimizing behavior. Consumer is following the way maximizes his or her utility or satisfaction and producer is also trying to maximize his or her benefit or to minimize his or her cost. In a single period CGE model, we would have a list of defined sectors for labor force, goods and investment markets which considering an open economy, import and export enter the model, too. Import commodity might be considered as perfect or imperfect substitute for domestic product.

Base of the computable general equilibrium models is Walras equilibrium thesis. Regarding perfect competition assumption which is one of the basic assumptions for generating general equilibrium models, theory

bases of these models are observable in competitive equilibrium theories. Policy variables in these models can be explained in various types such as tax rates, subside, supply and demand functions shifts, pricing regulations, government expenditure components, etc.

Organizing data for using general equilibrium models is one of the initial significant steps to generate these models. General equilibrium models' required data are gathered in a matrix, called Social Accounting Matrix (SAM) which commodity and service motilities, payment between sectors and economic classes and other accounts enter it. In a technical view, SAM is a square matrix in which each account is related to a single row and the same single column.

Each cell of this matrix is indicating payment from related column to the related row. Hence, each account's revenue is revealed in row and its expenditure appears in related column. The significant principal in computing social accounting matrix is equality between expenditure and revenue.

The providing model in this paper is one of the comparative static models which make the possibility of simulating in enforcing policies or changing exogenous variables. Consequently it is possible to study the effects of these changes on economy.

3-Model Details

We use the model that has been made by Dr Lofgren[1] as a base and extend and adjust it for Iran economy.

Table 1 indicates details of institutions, production factors, activities and commodities in model. Model details follow data of computed SAM.

1- Hans Lofgren. (2003), "Exercises in General Equilibrium Modeling Using GAMS", .IFPRI. Washington D.C.

Table 1: Model Details

Set	Elements
Activities	Agricultural, Industry and Mining, Oil and Gas, Service, Construction
Goods	Agricultural, Industry and Mining, Oil and Gas, Service, Construction and Trade commodities
Factors	Labor force and Capital
Households	Rural and Civic
Other Institutions	Government, Enterprises and Rest of The World

In this model it is assumed that each sector maximizes its own profit subject to the neoclassical production function with constant substitution elasticity for factors and fixed coefficients for intermediate inputs.

$$QA_a = ad_a \prod_f QF_{fa}^{\alpha_{fa}}$$

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

Each activity is able to produce other sectors products. Only oil and gas sector products only one output (oil and gas). Diagram 1 illustrates production technology in economy.

In the goods market prices are flexible and change for cleaning markets in the competitive condition. Thus demanders and suppliers are price taker in this model.

The factor incomes generated in the production process, are paid in fixes shares to the enterprises. These incomes are distributed between enterprises (for capital factor) and household (for capital and worker factor) in constant ratio. Enterprises spend their income on paying tax, purchasing consumption goods or saving. The residue of enterprises' income transfers to households (as capital gain) or other economic enterprises (transfer between enterprises).

Households also earn from their own primary production factors stock (directly from labor force and directly and indirectly from capital through firms).

$$YF_{hf} = shry_{hf} \ (\sum_f \overline{WF}_f . WFDIST_{fa} . QF_{fa} + tr_{f.row} . EXR)$$

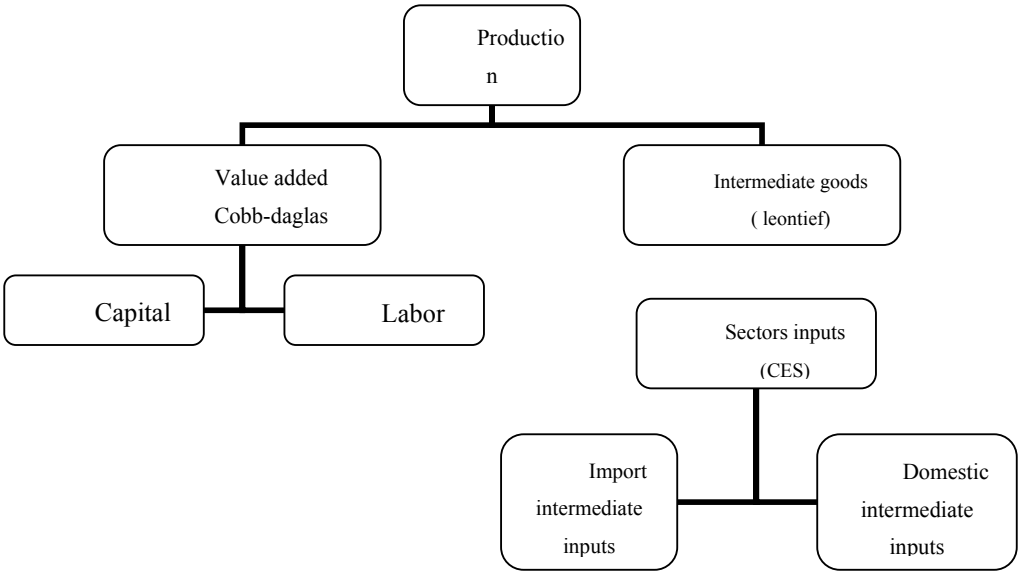

Diagram 1: Production Technology

Furthermore total income of households contains transfer payments from other economic institutions (government, enterprises and income of labor force who work out of country).

$$YH_h = \sum_f YF_{hf} . + \sum_i tr_{hi}$$

Households spend their income on paying tax, consumption and saving. They also transfer some of their own income to enterprises (for investment). The household consumption is shown by demand function results from maximizing the utility function.

$$QH_{ch} = \frac{\beta_{ch}(1-\overline{MPS}_h)(1-ty_h)YH_h}{PQ_c}$$

The government income results from the direct tax (income tax) and indirect tax (tax on sale, import, export and economic activities) and foreign loans.

Tax bases include constant ratio of tax rates. This income is spent on government fixed consumption expenditure or transfer payments to other domestic institutions. Some of government income may be used for paying back the foreign loans. What remains from government income will be saved. If the government saving is positive it specifies the budget surplus and if it is negative, it specifies budget deficit. Considering the government budget deficit in a specific year, government investment expenditure is provided by financial resources of monetary system of the country.

Other countries, on the one hand , communicate with domestic economy by giving financial payments in the form of loan or investment, to government or financial market ;and on the other hand ,by receiving loans ' payback, taking loan from domestic government or absorbing financial payments from financial market .In addition, the other aspect of foreign countries cooperation with domestic economy occurs by importing commodities or exporting .The assumption considered in this model is that in comparison with world economy , the economy of country is small scaled .So, export and import are done under price circumstances, determined globally .Transferring the income of labor force ,working out of country, towards country, and on the opposite side , transferring the income of foreign labor force , working inside country, to out of country ,is another aspect of domestic economy cooperation with global economy.

In this model, the assumption of qualitative difference between domestic products and import commodities is considered. On domestic demand side, this qualitative difference is taken into consideration under the assumption of imperfect substitution between import and domestic products which are supplied in domestic market. It means that if a specific good has an import equivalent, aggregate domestic demand –for households , government consumption, investment and intermediate demand – is prepared by combination of import goods and domestic products (in another word it is called composite commodity).

$$QQ_c = aq_c\,(\delta_c^q\,.QM_c^{-\rho_q} + (1-\delta_c^q)\,.QD_c^{-\rho_q})^{-\frac{1}{\rho_q}} \qquad c \in CM$$

The optimum demand quantity of these two groups of commodities depends on their relative price.

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

Similarly it is also assumed that there is an imperfect transfer for selling domestic products domestically and for their external selling (export) It means that domestic producer is able to supply his or her own product in domestic markets or export them.

$$QX_c = at_c\left(\delta_c^t . QE_c^{\rho_t} + (1-\delta_c^t). QD_c^{\rho_t}\right)^{\frac{1}{\rho_t}} \qquad c \in CE$$

The optimum supplied quantities of these two markets are also determined by their relative prices.

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

Considered assumptions on both demand side and supply side of the economy, lead to make domestic price system independent from international prices and also makes export and import response to relative prices changes .The quantity of supply and demand responses to occurred changes in relative prices depend on elasticity's, which are defined for equations.

The institution residual income after expenditure deduction is its accumulation. In this study, it is assumed that economic factors don't invest their entire saving, but they keep some in the form of financial funds .These funds contain money and deposited loans, foreign assets and other financial assets .Therefore, total accumulation of each institution, equals sum of the institution's saving and its funds in the last period. Economic institutions allocate some of their accumulation for investment and financial funds .In this model; demand for financial funds is accounted as an equivalent for money transactional demand. Hence, the amount of financial funds is a ratio of each institution's income. After allocating accumulation of each institution to investment and financial funds, investment begins in various economic sectors.

Sum of investment, done by institutions in each economic sector, show the total investment in that specific sector; which is prepared by capital, produced by different sectors. In money market, there is complete movement of financial funds. It means that some of funds can be attained from foreign country and similarly some of funds are transferred to out of country.

The relationships, explained the production, consumption and labor force market, are achieved considering of economic factors behaviors. But all in all, constraints which face economy in reality should be considered. These constraints might not be revealed in economic factors behaviors. Real constraints, remarked in model, are constraints, related to commodity and production factor markets; and nominal constraints, refer to current account, saving-investment account and financial account.

Supply in composite commodity market, is a combination of domestic products, sold in domestic markets, and import commodities. Also, demand contains final demand for consumption and investment, demand for intermediate inputs and demand for transactional commodities. Changes in domestic products, supplied in domestic markets, establish equilibrium in domestic output market. However, variation in the amount of import commodities, establish equilibrium in import commodities market.

In primary factor market, we achieve to factors demand function by maximizing profit function for every activities:

$$\overline{WF}_F \,.WFDIST_{fa} = \frac{\alpha_{fa} \,.PVA_a \,.Q\,A_a}{QF_{fa}}$$

In labor market, it is assumed that there is unemployment in this market, and according to the assumption of labor force complete movement, wages are fixed but number of labors, used in each sector, is variable. As a result, variation in number of labors, used in each sector, assures equilibrium in that sector. But in capital market, the amount of capital, used for each sector, is fixed and there is full employment of capital. Variation in rental price of capital assures equilibrium in this factor's market.

Regarding the assumption of fixed foreign saving, current account, considering the rest of the world, will be balanced by import variation. But in saving-investment account, it is assumed that balance in each institution's investment assures equilibrium in that institution .In financial account,

regarding fixed primary asset and foreign saving, capital outcome would assure equilibrium in this market.

This model is used for comparative static analysis and doesn't contain any dynamic aspect. For the reason that the capital stock is fixed, this model can be called a short run model. Since the model is computed under the assumption of existence of general equilibrium in economy, for policy analysis, it is assumed that economy moves from one single point to another one. (Model equations are provided in enclosure)

Diagram 2 shows the model structure.

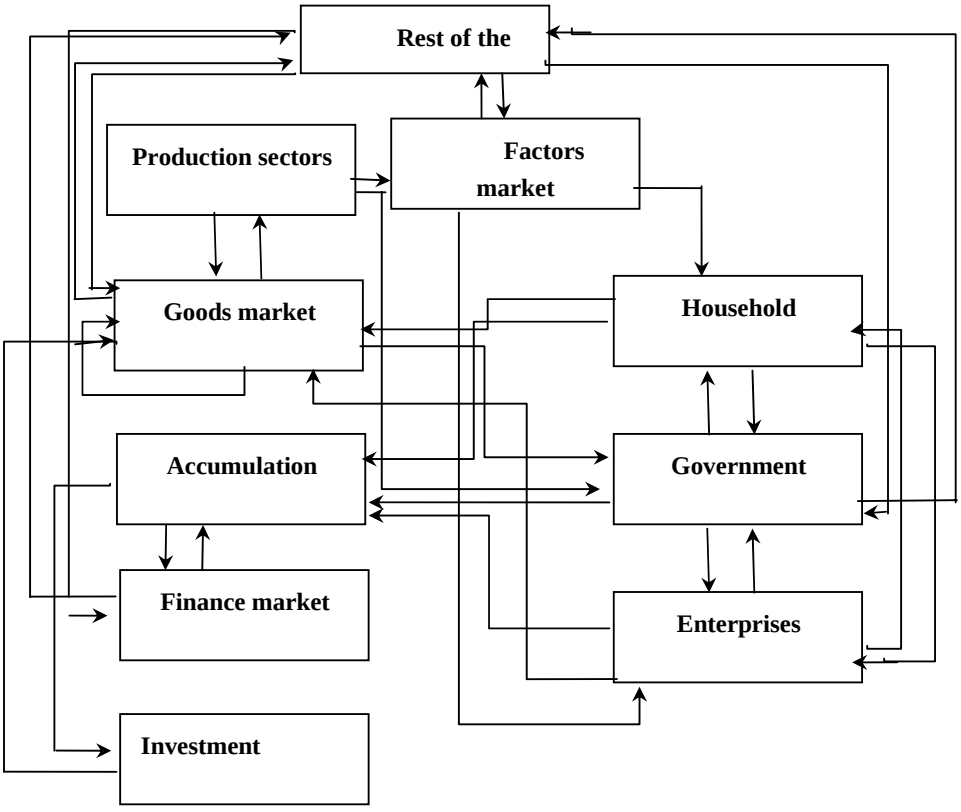

Diagram 2: Model Structure

3 – Accounting the Required Sam table

Required social accounting matrix in present paper, has resulted from social accounting table, accounted for Iran by Dr. Banooei and Dr. Asgari[1] (1) for the year 2001.It consists of 22 types of commodities, 21 production sectors and 7 types of production factors, first and second income allocation account, income and capital expense of civic and rural households, enterprises and government, financial account with 4 sub-accounts and the rest of the world account. Fixed capital formation account is also computed for 21 production sectors.

In the present study, using mentioned social accounting matrix, MACRO SOCIAL ACCOUNTING MATRIX (MACRO SAM) and MICRO SOCIAL ACCOUNTING MATRIX (MICRO SAM) have been computed in proportion to represented general equilibrium model in this paper.

As a result, commodity and service; and activity accounts are summarized in five sectors: agricultural, oil and gas, industry and mining, service and construction. Two types of production factors - labor force and capital- have been considered, too. First and second income allocation account and income expense account have been also summarized in just one account for civic and rural households , enterprises and government. Financial account is used as just one account, too. Moreover, fixed capital formation account has been prepared and summarized for five given sectors.

4- Determining Model Parameters

The model has been specified and solved by GAMS program .It contains 2 types of parameters. Share parameters are accounted directly from SAM data and behavioral parameters are accounted by data, out of SAM. These parameters results from previous studies in Iran or similar countries; or estimations, used for similar general equilibrium models.

1- Ali Asghar Banooei and Manoochehr Asgari , "Iran's social accounting table for the year 2001" . Institution of economic research of Iran, Bank of data and papers of Iran's economy

5- Discussing Scenarios

Using represented general equilibrium model, the impacts of variation in government expenditure on production, private investment and employment in different economic sectors are going to be studied as follows.

In this model it is assumed that government expenditure is an exogenous variable which is not dependent on other economic variables. In other words, if government expenditure is not dependent on other economic variables, the scenarios will indicate the effects of this expenditure on economy[1]. Thus, 2 scenarios are going to be considered, gather below.

1– 15% increase in government consumption expenditure

In economic issues, and its effect on gross domestic products (GDP) is studied given to multiplier. In other word, in the concept of government expenditure increase, substituting this expenditure with private investment, determines positive, negative or neutral effects on GDP and employment.

The advantage of using represented general equilibrium model in order to study the effects of government expenditure on economic variables, is that, although the results of enforcing this policy is observable on GDP, you are able to recognize them on labor force market, too .To examine the effects of increasing the government consumption expenditure, using a general equilibrium model frame work; income effect and substitution effect, result from enforcing this policy, would be discussed.

Income Effect:

Government expenditure increase leads to demand increase for commodities and service. This demand increase is prepared by domestic products and import commodities. Therefore, demand for domestic products and import increases. Consequently, domestic products increase leads to an increase in primary production factors, thus, the income of households and firms, results from production factors' income, will rise. Furthermore, while production is increasing, demand for intermediate inputs and transactional commodities increase too.

1- It is necessary to note that government expenditure in Iran is dependent on oil revenue severely. But the aim of this paper is studying the impacts of government expenditure on economy, provided that this expenditure would be independent on oil revenue.

A raise in household's income causes increase in their consumption expenditure and money transactional demand. To assure the equilibrium in stock account, on the one hand, as government expenditure and transactional demand for money increase, investment will decrease. On the other hand, as transactional demand for money increases in financial markets, given to fixed foreign saving; exchange rate and capital

Outcome will increase. In this situation, export should increase to assure equilibrium in current account.

Increase in production, will raise demand for labor and increase in production, import and household income, lead to increase government income through tax on sale, activity and income.

In brief , income effect , results from government expenditure are increase in domestic demand , import , income of households and firms , taxes , demand for intermediate and trade commodities , transaction demand for money , capital output , exchange rate and domestic price, employment ;and decrease in investment . But the effect on export is not defined.

Price Effect:

As demand for domestic products increases, domestic price of commodity will increase, and it will cause export decrease and import increase. On the one hand, raising the price of domestic products, decreases domestic demand; on the other hand, this price increases decreases households' consumption expenditure. Hence, domestic production will decreases, as export and demand decrease, thus, use of production factors will decrease, resulting in a decrease in employment and household's income and firm's income.

While exchange rate is increasing, the price of import commodities, increase; consequently demand for import commodities will decrease. In another point of view, raising the export price, results in export increase.

As a result, substitution effect of government expenditure increase leads to deduction in demand, production, employment, income of households and firms, import and money transactional demand. The price effect of government expenditure increase on export is dependent on both export and import elasticities to exchange rate and domestic prices.

Total effect of government expenditure increase on demand, domestic production, employment, and households' income and expenditure, depends

on income elasticity and price elasticity. If price elasticity is more than income elasticity, it will be expectable that demand, domestic production and consequently employment and households income, are going to reduce.

Total effect of government expenditure increase on investment is negative but the mentioned effect on trade balance depends on import and export elastisities to exchange rate and domestic prices .If import and export elasticities to exchange rate are more than import elasticity to domestic prices , import will reduce and export will increase ; therefore , trade balance will increase.

2- 15 % increase in government total investment expenditure

The effects of government investment expenditure are different from government consumption expenditure .This expenditure , used for generating infrastructures , prepares sufficient situation for private investment .Thus , it would be expectable to encourage private investors to invest and increase their investment incentives. In another point of view, about the mentioned expenditure, the issue of substitution effect is notable. Hence, final effect on GDP refers to the strength of these effects. Also, according to general equilibrium models frame work, it is feasible to study the impact of government investment expenditure increase in two sides: income effect and price effect.

Income Effect:

Raising in government expenditure, leads to an increase in investment, consequently demand for commodities and service will increase, and this demand increase will be prepared by increase in demand for import and domestic products .Domestic production increase , not only increases demand for transactional commodities, but it also causes demand for intermediate inputs and primary production factors. Raising the use of production inputs, results in an increase in labor force employment, consequently households' income increase too. Hence, households' consumption expenditure and their money transactional demand will rise. As a result, money transactional demand increases. Increase in capital outcome and exchange rate come along money transactional demand increase. In foreign trade balance, export increase covers increase in capital outcome and exchange rate.

In brief, income effect of increase in investment expenditure on production, employment and household's income is positive.

Price Effect:

While demand is increasing, domestic price increases. Domestic price increase, leads to decrease both demand and export. Thus, domestic production will reduce and consequently it will cause reduction in households' income.

Exchange rate increase leads to raise domestic price of import and export, resulting in import reduction and export increase.

Total effect of government investment expenditure, will be dependent on income elasticity and price elasticity of domestic demand. If income elasticity is more than price elasticity, production, employment and households' income will increase. The impact of this policy on trade balance depends on import and export elasticities to exchange rate and domestic prices. If import and export elasticities to exchange rate are more than import elasticity to domestic prices, import will decrease and export will increase, therefore, trade balance will increase.

The effect of increase in investment expenditure in one sector, on total investment, depends on the effect of enforcing this policy on investment in other sectors. Increasing the investment in one sector, considering this sector's use of other sectors' intermediate inputs, and marginal variation in production in each production sector, shows investment variations in each sector and consequently it specifies final effect on total investment.

In order to study this scenario, it is considered that government investment expenditure in various economic sectors has increased 15 % of total government investment expenditure. Hence, it is possible to compare the impacts of government investment expenditure increase on different economic sectors.

Also we are going to study effect of 3% increase government investment expenditure in all economic sectors simultaneously on GDP and employment too.

Policy Analysis:

A) 15% increase in government consumption and investment expenditure.

In the first we study results from 15% increase in government consumption expenditure (scenario 1) and government investment expenditure (scenario 2). We increase 3% government investment expenditure in all economics sectors that will raise total government investment expenditure to 15%.

The results of model simulation according to enforcing these two scenarios, have been shown in table 2.As you see, nominal GDP (market price), has decreased resulting from enforcing both of scenarios. But in the second scenario it is little (0.14%). We can see the same result about private investment. In other words, there is crowding out between government consumption expenditure and private investment but this effect is almost slightly for government investment expenditure and private investment.

As it is shown in table 2, while government expenditure is increasing, labor force employment decreases, but the effect of this policy on employment in different economic sectors is different. The only positive effect on labor force employment belongs to service sector. The negative effect on employment in construction sector is more than other sectors.

Increasing government investment expenditure has a positive effect on total employment (0.49%) that it relates to increase employment in agricultural and construction sectors although results show decreasing in employment in industry and service sectors.

Table 2: Result of Model Simulation (Increasing Government Consumption and Investment Expenditure)

Index	Results of Model Simulation	
	scenario1	scenario2
GDP (Market Price)	-8.26	-0.14
Investment	-15.09	-0.14
Labor force Employment	-1.38	0.45
Agricul Tural	-0.72	1.55
Oil and Gas	-3.31	0.0
Industry and Mining	-3.7	-0.84
Construction	-17.06	0.6
Service	3.81	-0.13

B) A 15% increase in government investment expenditure in different economic sectors

In this scenario government investment expenditure has increased 15%. .Hence, discussing scenarios in this section are mentioned below:

1- Increase in government investment expenditure in 'agricultural' sector to 15% of government total investment expenditure

2- Increase in government investment expenditure in 'oil and gas' sector to 15% of government total investment expenditure

3- Increase in government investment expenditure in 'industry and mining' sector to 15% of government total investment expenditure

4- Increase in government investment expenditure in 'construction' sector to 15% of government total investment expenditure

5- Increase in government investment expenditure in 'service' sector to 15% of government total investment expenditure

Government investment in oil and gas, and service sectors leads to increase GDP and private investment. Employment will increase by increasing government investment in all sectors expect investment in industry and mining sector. Government investment in agricultural sector increases employment than the other three sectors.

Table 3: Results of Model Simulation (Increasing in Government Investment in Different Economic Sectors)

Index	Results of Model Simulation				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
GDP (Market Price)	-0.51	0.03	-0.21	-0.1	0.09
Investment	-0.25	0.02	-0.23	-0.29	0.09
Labor force Employment	1.97	0.39	-0.97	0.98	0.16
Agricultural	8.93	-0.19	-0.55	-0.03	-0.26
Oil and Gas	-0.97	0.96	-0.07	-0.24	0.03
Industry and Mining	-3.6	-0.53	0.36	-0.51	0.11
Construction	-1.05	2.91	-5.07	4.96	1.34
Sevice	-1.05	-0.06	0.06	0.38	0.03

The results of enforcing each scenario that we can see in table 3 are as follows:

1- Government investment increase in agricultural sector:

Government investment in this sector will decrease GDP and private investment. But total employment increase because of arising employment in

agricultural sector (8.93%). though it is with decreasing at employment in other sectors. With other sectors, deduction in employment in industry and mining sector is more than others. Despite the decrease in labor force employment in other sectors, employment increase in agricultural sector will cause increase in total employment.

2- Government investment increase in oil and gas sector:

Raising the investment in oil and gas sector will cause a little increase in GDP, and private investment. It will increase employment in 'oil and gas' and 'construction' sectors. Consequently, despite employment decrease in 'agricultural', 'industry and mining' and 'service' sectors, total employment will increase (0.39%).

3- Government investment increase in industry and mining sector:

GDP and investment decrease as a result of increase in government investment in 'industry and mining' sector. Despite employment increase in 'industry and mining' and 'service' sectors, labor force employment decreases as a result of employment decrease in other three sectors (0.97%).

4-Government investment increase in construction sector:

However government investment in construction sector increases, GDP and private investment decrease. Enforcing this policy results in employment increase in 'construction' and ' service' sectors and decrease in employment in other sectors, consequently total employment will increase , too(0.98%).

5- Government investment increase in service sector:

Though government investment increase in service sector has positive effect on GDP and private investment, but these effects are weak. Labor force employment in all sectors except agricultural sector, has increased slightly; thus, total employment has increased, too.

Comparing the results of enforcing scenario 5 ,makes it clear that in comparison with other sectors , investment increase in 'service' sector, increases GDP and investment more than other sectors . But if the aim of enforcing a fiscal policy (to increase government expenditure) is increasing total employment, investment in 'agricultural' sector is better than investment in other economic sectors. And if the target of increasing government expenditure is raising employment in special sector we can give advices as a fellow:

For increasing in employment in all sectors expect 'service' sector, government investment expenditure should be increase in the same sector.

But for raising employment in ‘service’ sector, increasing in ‘construction’ sector is the best advice.

6- Conclusion

Before observing the results of enforcing scenarios, notice that general equilibrium models analyze the policies according to the assumed economic structure frame work .Thus, for policy analysis, using the model presented before, remembers that this model is accounted considering accounted SAM table for the year 2001.Hence, base of analysis is economic structure of Iran in 2001.

Increase in government expenditure influences on economy in different ways, depends on types of costs. Increasing the government consumption expenditure causes reduction in production, employment and investment.

Government investment expenditure has different effects on economy which depends on their nature and area they spent. Increasing the government investment expenditure in ‘oil and gas’, and ‘service’ sectors, makes an increase in GDP, and investment. In other words, government investment expenditure in mentioned sectors can be counted as private investment complementary and investment incentive .But government investment in ‘agricultural’, ‘construction’ and ‘industry and mining’ sectors has negative effects on economy. An increase in government investment in these sectors leads to decrease in production and investment.

But government investment in all sectors expect ‘industry and mining’ sector, will increase employment. More effect on employment in different economic sectors is depended to the sector that government invests on.

As a whole, we can result the effect of enforcing a fiscal policy as an increase in government expenditure is depend on which sector it will increase. So it can be an efficiency policy for increasing GDP or employment and it can have a negative effect on them.

Enclosure A:

Equation

1- $PM_c = pwm.(1+tm_c).EXR$

2- $PE_c = pwe.(1-te_c).EXR$

3- $PDD_c = PDS_c + \sum_{c'} PQ_{c'}.icd_{c',c}$

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

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

6- $PA_a = \sum_c PX_c.\theta_{ac}$

7- $PVA_a = PA_a(1+ta_a) - \sum_c PQ_c.ica_{ca}$

8- $QA_a = ad_a \prod_f QF_{fa}^{\alpha_{fa}}$

9- $\overline{WF}_F.WFDIST_{fa} = \frac{\alpha_{fa}.PVA_a.QA_a}{QF_{fa}}$

10- $QINT_{ca} = ica_{ca}.QA_a$

11- $QT_c = \sum_c icd_{c,c'}.QD_c \qquad c \in CT$

12- $QX_c = \sum_a \theta_{ac}.QA_a$

13- $QQ_c = aq_c(\delta_c^q.QM_c^{-\rho_q} + (1-\delta_c^q).QD_c^{-\rho_q})^{-\frac{1}{\rho_q}} \qquad c \in CM$

14- $\frac{QM_c}{QD_c} = (\frac{PDD_c}{PM_c}.\frac{\delta_c^q}{1-\delta_c^q})^{\frac{1}{1+\rho_q}}$

15- $QQ_c = QD_c \qquad c \in CNM$

16- $QX_c = at_c(\delta_c^t.QE_c^{\rho_t} + (1-\delta_c^t).QD_c^{\rho_t})^{\frac{1}{\rho_t}} \qquad c \in CE$

17- $\frac{QE_c}{QD_c} = (\frac{PE_c}{PDS_c}.\frac{1-\delta_c^t}{\delta_c^t})^{\frac{1}{\rho_t - 1}}$

18- $QX_c = QD_c \qquad c \in CNE$

19- $QFIN_s = ifi_s.YI_i$

20- $QACU_s = \sum_v qinvbar_{v,s}.IADJ + QFIN_s$

21- $QINV_v = \sum_s qinvbar_{v,s}.IADJ$

22- $QDINV_c = \sum_V iiv_{cv} . QINV_v$

23- $YF_{hf} = shry_{hf} \left(\sum_f \overline{WF}_f . WFDIST_{fa} . QF_{fa} + tr_{f.row} . EXR \right)$

24- $YH_h = \sum_f YF_{hf} . + \sum_i tr_{hi}$

25- $QH_{ch} = \frac{\beta_{ch} (1 - \overline{MPS}_h)(1 - ty_h) YH_h}{PQ_c}$

26- $YF_{ins.f} = shry_{ins.f} \left(\sum_f WF_f . WF_f . WFDIST_{fa} . QF_{fa} + tr_{f.row} . EXR \right)$

27- $YI = \sum_f YF_{ins.f} + \sum_i tr_{ins,i}$

28- $EI = \sum_c PQ_c . qi_c + \sum_i tr_{i,ins}$

29- $YG = \sum_h ty_h . YH_h + \sum_c tq_c . (PDD_c . QD_c + PM_c . QM_c)$
$+ \sum_{cM} tm_c . EXR . pwm_c \; QM_c + \sum_{cE} te_c . EXR . pwe_c . QE_c$
$+ \sum_a ta_a . PA_a . QA_a + ty_{ins} . YI + tr_{gov.row} . EXR$

30- $EG = \sum_c PQ_c . qg_c + \sum_i tr_{i,gov}$

31- $\sum_f QF_{fa} = QFS_f$

32- $QQ_c = \sum_a QINT_{ca} + \sum_h QH_{ch} + qg_c + qi_c + QT_c + QDINV_c$

33-Saving- Investment Balances

$$\sum_v QINV_v + \sum_s QFIN_s + WALRAS = \sum_h MPS_h . (1 - ty_h) . YH_h +$$
$$(YG - EG - tr_{row.gor} . EXR) + (YI - EI - ty_{ins.yI_p}) + \sum_s qfinbar_s .$$

34-Fund Balance

$$\sum_s QFIN_s + \overline{FSAV} . EXR = \sum_s qfinbar_s + OCAP . EXR$$

35-Foreign Balance

$$\sum_{cE} pwe_c . QE_c + \sum_i tr_{i.row} + \overline{FSAV} + \sum_f tr_{f.row} =$$
$$\sum_{cM} pwm_c . QM_c + \sum_f tr_{row.f} + tr_{row.gov} + OCAP$$

Enclosure B:	Macro SAM Table for Iran(2001)										Million dollar
	Activity	**Good**	**Factors**	**Household**	**Government**	**Enterprise**	**Accumulation**	**Investment**	**Financial sector**	**Rest of the World**	**Total Income**
Activity		1149108.151									1149108.2
Good	417436.337	0		397375.679	104733.108	0	28620.912	177593.418		157720.338	1283479.8
Factors	722717.463									4209	726926.46
Household			439332.435	356707614	32654	13773				52	357193425
Government	8964.999	9385.989	151050	37040	13740	0				1,715	221895.99
Enterprise			133339.8	5623847	-4720	0				1	5752467.8
Accumulation			0	51357.733	74792.892	114846			115,541		356537.63
Investment							177592.526				177592.53
Financial sector							150326		19393	4075	173794
Rest of the world		124975.706	3206	37	696				38860		167774.71
Total Expenditure	1149118.8	1283469.846	726928.235	362817271	221896	128619	356539.438	177593.418	173794	167772.338	

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