

AN ISSUE-ORIENTED  
MACRO-MICRO PROTOTYPE  
ECONOMIC MODEL FOR A  
GULF COOPERATION  
COUNCIL COUNTRY

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*“ CAPTURING GOVERNMENT FINANCE,  
LABOR MARKET AND ECONOMY WIDE  
INTERACTIONS ”*

**By**

**Motaz Khorshid**

Professor  
Chairman of Operation Research &  
Decision Support Department  
Faculty of Computers and Information  
Cairo University, 5 Sarwat Street, Orman  
Giza, P.O.Box 12613, Egypt  
E-Mail: [mhkhoshid@yahoo.com](mailto:mhkhoshid@yahoo.com)  
Phone/Fax : (202)7603640, Mobile :(2012)2394966

## **ABSTRACT**

To analyze the two major common structural imbalances facing a typical gulf cooperation council (GCC) country, an issue-oriented macro-micro economic model was constructed and used to test alternative policy measures and development scenarios. The microeconomic part of the model addresses labor market and public finance structural aspects, whereas the macroeconomic part captures the linkages and interactions within the economy as a whole. The developed model consists of three interrelated modules; a) a central dynamic computable general equilibrium (CGE) model, b) a sector specific sub-model particularly constructed to analyze the behavior of a typical labor market in the GCC region and c) a disaggregated public finance sub-model directed to test the specific fiscal reform policies adopted by the GCC governments.

In order to test the usefulness of this prototype analytical tool, it was used to investigate the impact of three alternative development scenarios facing the Kuwaiti economy. The first scenario applies the same policy measures adopted during the 1990s. This *reference path* is used to evaluate the degree of risk associated with the continuation of the current economic trends. The second development scenario applies a comprehensive *fiscal reform* program directed to eliminate government budget deficit and restore public sector assets held abroad. In the last scenario, the fiscal reform program is combined with a *private sector employment policy*. This policy consolidates the current government efforts directed to increase the participation of Kuwaitis in the private activities as a way to resolve one of the major labor market imbalances prevailing in Kuwait during the last two decades.

Results of adopting the fiscal reform scenario have shown a significant increase in non-oil income as well as in its share in total public revenues in 2005. On the macroeconomic side, the fiscal reform package has contributed to reducing public sector resource gap, improving the macroeconomic balance and accelerating the restoration of government assets held abroad. The public finance program has nevertheless generated negative impact on economic growth and social welfare of Kuwaiti citizens. When the private employment policy is combined with the fiscal reform scenario, the unemployment rate of Kuwaitis decreased considerably and the structure of both the national labor force and the labor market became more balanced than before. A further decline in the growth rates of the economy is however observed under this combined scenario. Additional macro management policies are then required to counteract this negative impact on the growth prospects of the Kuwaiti economy.

## **1. Introduction**

**The gulf cooperation council (GCC) countries are currently suffering from two major structural imbalances; a) an unbalanced population structure and labor market profile, and b) an increasing public sector resource gap resulting from the fluctuation of oil prices, the inflated public spending and the non diversified sources of public revenues.**

**Since the successive declines in oil prices during 1986-1998, most GCC governments are accumulating budget deficits and using part of their foreign assets to finance them. Because income from oil exports represents a large percent of total public revenues, any change in oil prices is directly reflected in the budget balance account. Furthermore, the difficulty to apply control measures on the growth of government public expenses, in general, and expenditure on wage bill, in particular, has also contributed to increase the size of deficit and its financing needs as well. Given the commitment of these governments to create jobs for the growing national labor force and considering the limited participation rates of nationals in the private activities, public sector compensations of employees have substantially increased during the last two decades of the previous century. Although most GCC countries -since the mid 1980s - have formulated various policies to diversify the sources of government income, the implementation of these policies has practically failed due to the absence of a tax system, the inefficient pricing of public goods and the adoption of a comprehensive subsidy program that benefits households, public enterprises and to a great extent the private corporations. Because government sector is a major actor in the GCC economies, any suggested policy package for reducing the public sector resource gap and restructuring the budget accounts should be addressed not only within the public finance context but also as part of the macroeconomic management policy( Khorshid 2001).**

**Two basic elements have characterized the performance of labor markets in the Gulf Cooperation Council (GCC) countries; (i) an extensive imports of foreign workers to support the ambitious development programs and satisfy the employment needs of the private sector and (ii) an inflated government sector to create jobs for the increasing supply of national labor force. The success of this employment policy relied, to a great extent, on financial resources resulting from the considerable oil export revenues and the significant returns on foreign public assets held abroad. The continuation of such policies has contributed, however, to a number of structural imbalances. On the one hand, unbalanced population structure and labor force profile emerged as a general feature of the GCC countries. On the other hand, dualities among national and expatriate workers and between private and public labor markets emerged as a specific characteristic of the region. This situation has also created an inflated government institutional structure, a considerable decline in public sector labor efficiency and a significant growth in public sector spending.**

**Furthermore, with a natural growth rate of national populations that generally exceeds 3% a year along with an anticipated increase in women's**

participation rates, the number of national job seekers is expected to increase by 5 to 6 percent on the average. Given the current economic trends to encourage private initiatives and privatize public sector activities, the government sectors in the GCC region will no longer be able to create the same number of jobs for the newly graduating national population. When the resulting excess in the supply of national labor is not absorbed in the private establishments, it will necessarily join the unemployed labor category (Khorshid 2000a)

To investigate the above structural imbalances in the government finance sectors and the labor markets of the GCC countries and to evaluate their macroeconomic effects, a specific analytical tool, or a computational model, is required. The analytical model, which represents the main purpose of this paper, is particularly designed to capture, on the one hand, the interactions and linkages within the economy wide system and depicts, on the other hand, the specific microeconomic features of public finance sector and labor markets mechanisms characterizing a typical country in the GCC region. Accordingly, the model of this paper consists of three interrelated modules; a) a central dynamic computable general equilibrium (CGE) model that can be used to capture the economy wide linkages and policies, b) a sector specific sub-model particularly constructed to analyze the behavior of a typical labor market in the GCC region and c) a disaggregated public finance sub-model directed to test specific fiscal reform policies adopted by the GCC governments. The proposed model relies on the recent developments in the fields of issue-oriented computable general equilibrium modeling and sector specific public finance and labor markets models. The database of the model is composed of a social accounting matrix of the economy, a disaggregated public finance accounting system and a labor market accounts broken down by sector, activity and nationality.

The purposes of this paper are: a) to develop a prototype macro-micro modeling framework for analyzing public finance, labor markets and the economy wide behavior of a typical GCC country, b) convert the prototype modeling framework to a specific model for the Kuwaiti economy and c) Use the Kuwaiti model to test a selective sample of the public finance and labor market policy measures and assess their potential impact on the medium term path of the economy.

## **2. Labor Markets In The GCC Countries**

### **2.1. Principal Structural Features**

With considerable oil revenues and growing returns on public assets held abroad, the GCC countries used their government expenditure policies to finance the employment opportunities for new national job seekers (Khorshid 1997: 47). Based on official statistics, which is widely quoted, the bulk of national labor force is employed in the public sector with expatriate workers from Arab and Asian countries that took up the remaining unfilled jobs. The picture is however reversed with respect to the private

sector where most of the offered jobs are occupied by foreigners. The large presence of expatriates in the private sector has depressed its average wage rate and made the sector less attractive to the national labor force. This situation has also directed the owners of the private business, for profitability reasons, to expand the process of hiring more expatriates (Khorshid 2000: 5).

The continuation of such policies has contributed, however, to a number of structural imbalances. On the one hand, unbalanced population structure and labor force profile emerged as a general feature of the GCC countries. Based on officially published data of the GCC secretariat, the statistical offices on the country level and other research institutions, the percent of nationals to total number of workers in the region decreased significantly from 61 percent in 1975, to 33 percent in 1985 and to only 26 percent in 1995. On the other hand, dualities among national and expatriate workers and between private and public labor markets represented a specific characteristic of the region. Consider, for instance, the labor indicators of Kuwait and the United Arab Emirates (UAE) as two representative countries of the gulf region. In 1995, the number of nationals working in the private sector represents 5.9% and 8.7% of total national labor force, respectively. Most importantly, the share of national labor in total private sector employees does not exceed 2% in both countries. On the contrary, the public sector has generally employed more than 90 percent of nationals during the last two decades. This situation has also contributed to creating an inflated government institutional structure, a considerable decline in public sector labor efficiency and a significant growth in public sector spending

Furthermore, with a natural growth rate of national populations that generally exceeds 3% a year along with an anticipated increase in women's participation rates, a higher growth in the number of national job seekers is expected. During the period 1985-1995, the supply of national manpower in Kuwait, Qatar and UAE grew by 6.2, 5.2 and 5.5 percent (Girgis 2000). Given the current world wide economic trends to encourage the private initiatives and privatize public sector activities, the government sectors in the GCC region will no longer be able to create the same number of jobs for the newly graduating national population. If the resulting excess in the supply of national labor is not absorbed in the private establishments, it will necessarily join the unemployed labor category. Although the unemployment among national workers in the region is considered to be a new phenomenon, its momentum has been building up for more than a decade due to accumulated distortions and a mismatch between the supply and demand for labor (Sirageldin and Khorshid 1996:52).

The above imbalances are aggravated by both regional and international factors. First, the slowdowns resulting from the instability of the oil prices, particularly in 1986 and 1998, have created, on the one hand, cyclical unemployment among nationals and contributed, on the other hand, to worsen the investment environment and decrease the demand for labor in the region (Girgis 2000: 118). Second, the two gulf wars, along with their

political and economic consequences, have negatively affected both the development efforts and the job formation process in the region. For example, the second Gulf war of 1990 has generated sizable losses to the Kuwaiti economy and its labor markets. Empirical evidence indicated that the post-war structure of non-Kuwaiti labor has witnessed a shift towards more unskilled workers due to the departure of many skilled workers because of the Iraqi aggression (PAAC 1999). Finally, the region was also affected by a number of unfavorable international and regional financial events. On the world wide level, the most significant one of them is the recent Asian crises of 1997 which has generated negative consequences on most socioeconomic indicators of the region (Khorshid and Al-Ibraheem 2000). An example of the regional events is “Al-Manakh” debt crisis which resulted in a negative impact on the performance of the Kuwaiti stock market in 1983 and thereafter.

## **2.2. Labor Market Imbalances**

To investigate the persisting duality, market segmentations and other imbalances in the GCC region in a more specific manner, Kuwait and the UAE are selected as two representative countries. Most of the indicators discussed in this section are computed from published and unpublished data kindly provided by the ministries of planning in these countries.

### **2.2.1. Private - Public Labor Duality**

In 1995, the private sector workers in Kuwait and UAE represent, respectively, 70 and 83 percent of the total number of employees. These indicators stress the importance of this sector in the formulation of any future labor market plans for the region. Given that the share of nationals in the private sector does not exceed 5 percent in the two countries, the private activities can be considered then as one of the major element directed to overcome the expected future unemployment problem among nationals. The main sectors contributing to this low participation of nationals are non-oil manufacturing, construction as well as private community and personal services. For example, the share of Kuwaitis in these sectors is 2.5, 1.9 and 1.2, respectively. Given that the skills required for these sectors are limited in the supply vector of national workers, a specific training and re-orientation program would be an urgent pre-requisite. On the contrary, the share of national labor force in government services reaches 34 percent in the UAE and exceeds 63 percent in the case of the Kuwaiti economy. These public sector employment indicators provide empirical evidence about the limited degrees of freedom available to policy makers in the GCC countries to use the substitution policy in overcoming the expected increase in the unemployment rates among nationals.

### **2.2.2 National and Expatriate Labor Markets**

In general, the data of Kuwait and UAE show a considerable bias of nationals towards clerical work (particularly in public sector), military

occupations, teachers, non-science professions as well as senior management. As a percent of total Kuwaiti labor force, for example, clericals and policemen represent 41 percent, manager and supervisor professions account for 17 percent, teachers represent 13 percent whereas the share of the remaining professions does not reach 7 percent. On the other hand, the shares of skilled and semi-skilled nationals labor in their total supply are below 5 percent in both Kuwait and UAE. Furthermore, technicians in medicine and engineering does not exceed 4 percent in Kuwait. These results stress the need for readjust the education and training systems in the region in order to produce a more balanced occupational structure. The indicators of the UAE show a general trend towards low participation of national workers in most occupations. The only exception to this rule is the military occupation where nationals represent 56 percent of the total workers. In Kuwait, however, nationals have reasonable participation rates in four occupational groups which are; teachers, social scientists, managers and supervisors and clerical workers. Their participation in these occupational groups exceeds generally 50 percent of the total number of workers.

### **2.3. Policy Responses**

Given the above structural imbalances, it is strongly believed, in the GCC region, that enhancing the productivity of national labor force and increasing their participation in the economic activity, in general, and in the private sector, in particular, will necessarily form a major strategic issue facing the policy makers in the near coming future. Because of the differences in economic rules that govern the functioning of both the private and public sectors, the depressed wage rates of expatriates in the private sector and the preference of national labor force to work in the public institutions, it is necessary to adopt a comprehensive and consistent policy package directed to achieve the following general objectives; i) apply macroeconomic policies compatible with the employment objectives, ii) take the necessary measures to encourage private establishments to engage more national workers , iii) adopt a comprehensive national training and re-orientation program particularly designed to direct new entrants in the labor market towards private sector working conditions and finally iv) create appropriate funds to finance the job creation process for new graduating nationals.

Given the above general policy trends, several policy measures were suggested and part of them were applied. Since the unemployment problem is considered as a relatively new phenomena, policy measures, applied since the mid-eighties, have mainly concentrated on two interrelated issues: (a) achieving a more balanced population structure via the control of the dependency rates of expatriates and their work permits and (b) the substitution of foreign labor by nationals in the public sector activities. In Kuwait for example, the government decided recently to replace 10 percent of foreign workers by Kuwaitis in the public sector per year. These policies have generated, however, negative social impact and contributed, as well, to reducing the efficiency of public sector employees. Although most development plans of the region included, as one of their objectives, the

enhancement of the productivity of national workers and the increase of their participation in the private activities, no real changes have been observed up till now.

Beginning from 1990 decade, the number of national job seekers have considerably increased, particularly among females, and the substitution possibilities among nationals and expatriates in the public sectors became more limited than before. This fact stressed the need for specific policy measures to increase the participation of nationals in the private sector and encourage the private employers to hire more national workers. In general, these policy measures have been formulated under the umbrella of a law for “the support and protection of national labor force”. These policies can be grouped into three categories: (a) apply direct and indirect means to encourage private establishments to engage nationals. These means range from the payment of the difference in wage bill between national and expatriate workers by government to the application of special subsidy measures to support the establishments that hire more national labor force, (b) create a tax program aiming at increasing the cost of foreigners working in the private enterprises; either directly by applying a per capita labor tax or indirectly by increasing the cost of health care and other social welfare programs provided by government for expatriate labor, and (c) adopt a national program for training and re-orienting new national graduates towards the functioning modes and specific economic conditions of the private sector. In Kuwait, the national assembly has recently approved a law in support of national labor along the same policy measures summarized above. Policy makers in the UAE adopted however, a relatively different approach based on; (a) establishing specialized units in the private enterprises to train nationals and (b) creating direct linkages between the ministry of labor and social affairs and the private establishment in order to support the creation of employment opportunities for nationals.

### **3. Government Finance in the GCC Countries**

#### **3.1. An Overview**

Public finance sectors of the GCC countries share a number of common or general features, the most important of them are; a) the heavy reliance on oil export revenues, b) the absence of a real tax program, c) the growing share of wage bill in total spending, d) the considerable expenditure on social aid and subsidy programs and finally e) the increased role of government finance policies, in general, and public investments, in particular, in supporting and energizing the macroeconomic performance. During the 1980s, average share of oil export earnings in total public revenues of Saudi Arabia (SA), UAE and Kuwait was 66 percent, 83 percent and 89 percent, respectively. Due to adopted measures to diversify the sources of public income during the 1990s, the above shares have slightly changes to 57 percent, 79 percent and 87 percent. Government spending in the GCC countries is highly biased towards current expenditures. During the 1990s, the share of current spending to total

expenditure in UAE, SA and Kuwait is estimated as 80 percent, 63 percent and 85 percent, on the average (Economic Bulletin of the GCC countries 1999). The three major elements of this inflated government spending are the compensation of employees, welfare transfers to households and subsidies directed to public authorities and private corporations. Since 1985, all the budgets (or closing accounts) of the GCC countries show a deficit that ranges, as a percent of GDP, from 12.5 percent in UAE and 17 percent in SA to around 20 percent in Kuwait.

### **3.2. Public finance imbalances**

Because of the successive fluctuation in oil prices during 1986-1998, the governments of the GCC countries accumulated budget deficits and used part of their foreign assets to finance them. Because income from oil exports represents, on the average, more than 70 percent of total government revenues in the Gulf region, any change in oil prices is directly reflected on the balancing account of the budgets. Furthermore, non oil income as a source of financing public expenses is very small in these countries due to the absence of a real tax revenues and the subsidized prices of the sales of public goods and services. In addition, the difficulty to apply control measures on the growth of current public expenses, in general, and expenditure on wage bill, in particular, has also contributed to increase the size of deficit and its financing needs as well. Given the commitment of the GCC governments to create jobs for the growing national labor force and their very small participation rate in the private activities, public sector compensations of employees have substantially increased during the last two decades. Finally, since the discovery of oil in the GCC region, most of its countries adopted a comprehensive subsidy program that covers not only households and non profit institutions but also the private corporations. In Kuwait for example, public wage bill and government current transfers in 1999, as a share of GDP, represented 15 percent and 25 percent, respectively. Tax income does not exceed however 3 percent of the GDP.

For the above reasons, the fiscal reform measures adopted by the GCC countries – since the 1980s – have failed to achieve the desired objectives. Beginning from the 1990 decade, policy makers in the region have however clearly identified the need to diversify the sources of public revenues, eliminate budget deficits and resolve other income and expenditure structural imbalances prevailing in their government budgets, as a first and important step towards achieving the planned growth and welfare goals. Given that the government sector is traditionally the main economic actor in the GCC countries, any suggested policy package for reducing the public sector resource gap should be addressed not only within the public finance context but also as part of the macroeconomic management policy.

### **3.3. Fiscal Reform Policies**

Within the current world wide economic policies directed to encourage private initiatives, privatize public activities, support private foreign

investments and re-define the role and functions of the public sector, governments of the GCC countries are in process of applying a set of public finance policy measures compatible with these development trends. Some countries, such as Kuwait, have endorsed a comprehensive fiscal reform program to diversify sources of public income and restrain government spending. Other countries, such as UAE and Saudi Arabia, have adopted gradual adjustment measures to redirect the government activities towards the adoption of the new policy trends.

Given the above economic context, the governments of the region need to evaluate, on the one hand, the already adopted fiscal policies and to select, on the other hand, new appropriate public finance measures to achieve the desired objectives. The public finance policy measures can be grouped under three broad categories; a) policies concerned with increasing and diversifying sources of public income, b) policies related to improving the structure and performance of government spending and c) policies directed to reducing the public sector resource gap (or budget deficit) and finding appropriate means for its finance. Most of these policy tools should be evaluated, not only according to their effects on the restructuring and balancing of the government financial accounts, but also based on their impact on the performance and structural balances of the whole economic system. In other words, the selected fiscal reform programs should be assessed in light of the adopted macroeconomic management policies.

#### **4. Structure of the Issue Oriented Prototype Model**

Recent analysis of the structural imbalances and emerging medium term policy options facing the GCC economies - after the 1990 Gulf war - stressed the need for a specific type of computational models that captures the macroeconomic aspects of the country as well as the specific microeconomic features of the public finance sector and labor market behavior. To achieve this purpose, we need to build on the recent development in the area of issue-oriented multi-sector dynamic computable general equilibrium (CGE) models coupled with sector-specific public finance and labor market sub-models. Recently, several issue-oriented economy wide models have been developed and successfully used in medium term policy formulation and testing. Population economic models (Moreland 1991 and Khorshid 1994a), Energy economic interaction models (Blitzer and Eckaus 1988) and public finance economy wide models (Khorshid 1998) are examples of such issue-oriented models. Compared with other issue-oriented economy wide models, the GCC prototype model reveals the following characteristics; (a) a more elaborated inter-period adjustment mechanisms are specified in the model to capture population dynamics, labor force supply changes and foreign assets management strategies, (b) a highly disaggregated public finance sub-model that captures the particular features of government income and spending policies and (c) a disaggregated labor market sub-model to analyze the employment policies of the region by economic sector, activity and nationality. In the following paragraphs we begin with the description of

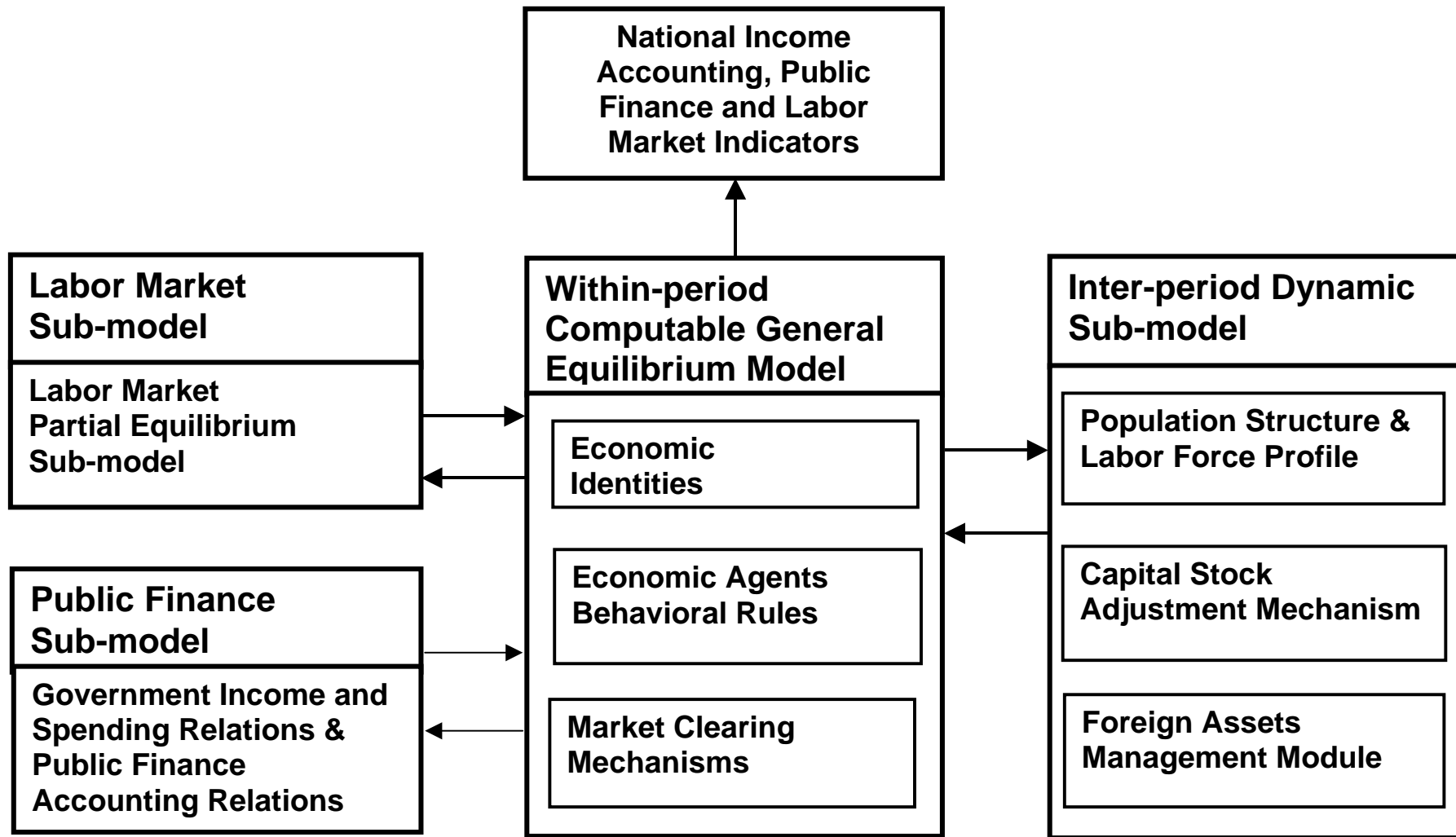
the main blocks of the model and its accounting framework and then with a brief description of the economy wide, public finance and labor market mathematical relations.

#### 4.1. The Main Blocks of the Model

Figure (1) provides a schematic representation of the overall issue-oriented macro-micro economic modeling system. The central part includes the within period computable general equilibrium model. Similar to other static CGE systems, our model consists of three basic relations; a) economic identities, b) technology choices and decision rules of independent economic agents and finally c) market clearing mechanisms or closure rules. The static model is based on a social accounting matrix (SAM) of the economy with a disaggregated public finance and labor market accounts. The central within period model interacts with three main sub-models. The first sub-model defines most economic inter-period relations such as the population structure, the supply of national labor force, the physical capital stock adjustment mechanisms and the dynamic updating rules of the public and private assets held abroad. The second sub-model, which represents the public finance sector, is directed to analyze government income and expenditure policies in a detailed manner (Khorshid 1998:118). It establishes the linkages between the detailed accounts of government budgets in a GCC country and the income and expenditure variables of the public finance sector as defined within the economy wide framework. Finally, the third sub-model reflects the detailed labor supply and demand relations (by nationality, economic sector and activity). Because the sub-model permits a certain unbalances between the supply of and the demand for national workers and given the equilibrium of labor markets by sector and activity (in the within period model), this sub-model can be considered, in a way, as a partial equilibrium type of models.

#### 4.2. The accounting framework

For calibration purposes and to capture linkages and accounting identities of the economy, an accounting framework should be constructed from the base year data. The accounting framework is generally used to estimate most of the structural parameters of the model such as input output coefficients, cost structure parameters and expenditure patterns of domestic institutions. It is also used to calibrate model results and support other model building activities ( Pyatt and Round 1985, Drud, Grais and Pyatt 1986 and Khorshid 1985). Other data forms are nevertheless required to complete the implementation of the model. These include, for example, the time series data used in estimating the model's behavior parameters, base year capital stocks and population data as well as the inter period dynamic parameters. In Figure (2), components of the database for the prototype GCC model are outlined.



**Figure 1: Overall Structure of the Public Finance Labor Market Economy-wide Model**

The central part of the database consists of the base year social accounting matrix (SAM) and other macroeconomics aggregates not included in the SAM. The constructed SAM is highly disaggregated with respect to government and labor market accounts and less detailed for other accounts of the economy. The SAM is linked with the detailed budgetary accounts of the financial statements produced by a government of a GCC country. In addition, base year employment data in thousands by economic sector, production activity and nationality are also included in the modeling database. Furthermore, other base year stock data are required to support the dynamic adjustment relations of the model. These data include national and expatriate population size, physical capital stock by production sector and base year financial assets held abroad. Although not strictly part of the database, some inter period parameters and exogenous variables are needed for the scenario formulation process. These data include world wide economic indicators (such as world commodity prices and international interest rates) and the changes in policy measures and parameters over time.

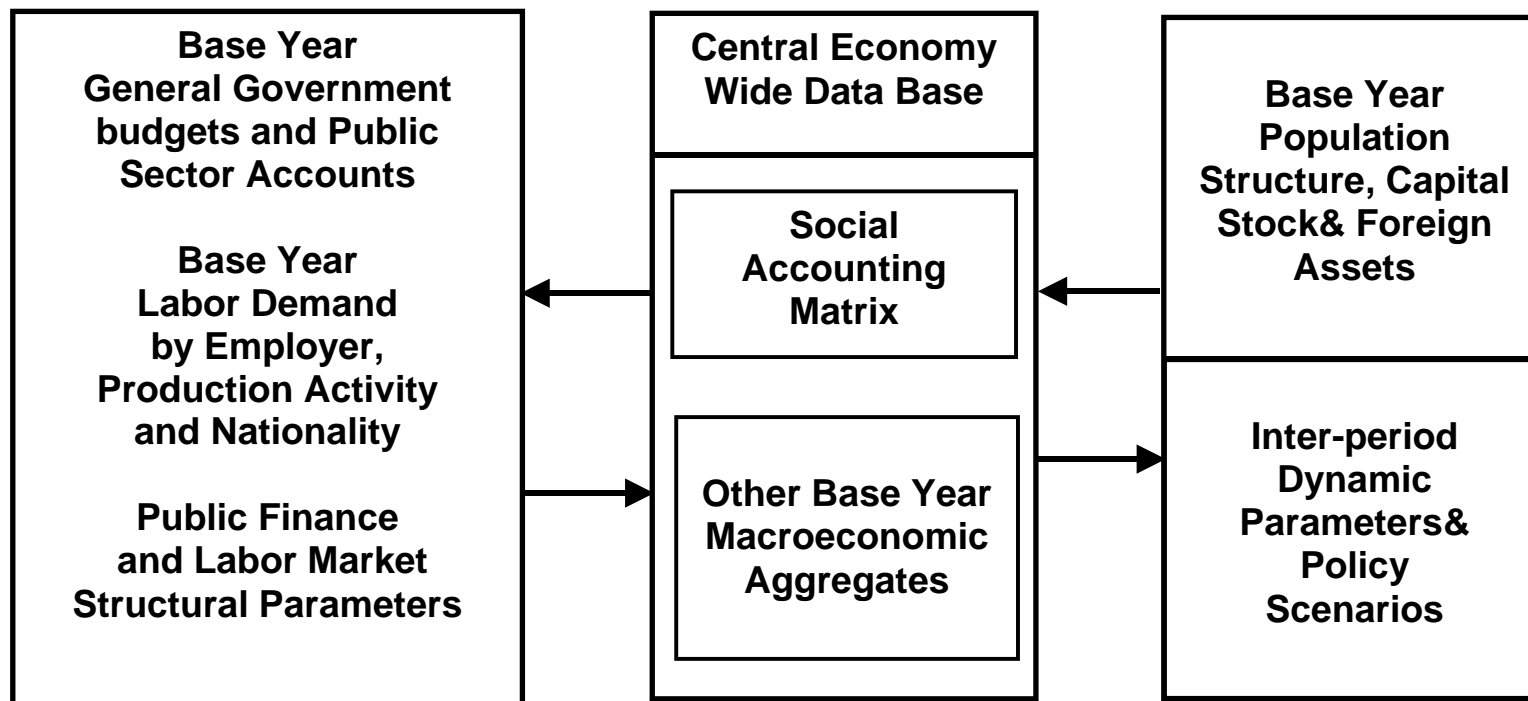
### 4.3. The economy wide modeling structure

As it was noted above, the economy wide component of the prototype model consists of the within period static sub-model and the inter-period dynamic relations. From a technical point of view, the static part of the model includes both structuralist and neoclassical elements (Taylor 1990). The structural approach has the institutional structure of the economy as its point of departure whereas neoclassical modeling takes hypotheses of optimizing agent behavior as its starting point. The structural features of the model include, for example, a supply-driven oil sector and fixed nominal wages. Nonetheless, in several areas the model includes various neoclassical aspects such as market clearing output prices and input substitutability.

The equilibrium solution of the within-period sub-model may be viewed as being determined by: a) the independent decisions of the economic agents intervening in the economy such as households, companies and government sector and b) the market closure rules that ensure the reconciliation of these independent decisions. The inter-period economy wide sub-model captures the dynamic path of the economy from one equilibrium point to another. In the following, these aspects of the economy wide model will be presented in verbal forms.

#### 4.3.1. The within period static relations

The decisions of economic agents are governed by a set of behavioral assumptions and technological constraints. The first factor represent the preference of agents whereas the second factor depends on the institutional structure and technological progress in the country of interest. In the next



**Figure 2: Main Components of the Accounting Framework**

sections, we begin with production and foreign trade decisions and then with the behavior of domestic institutions.

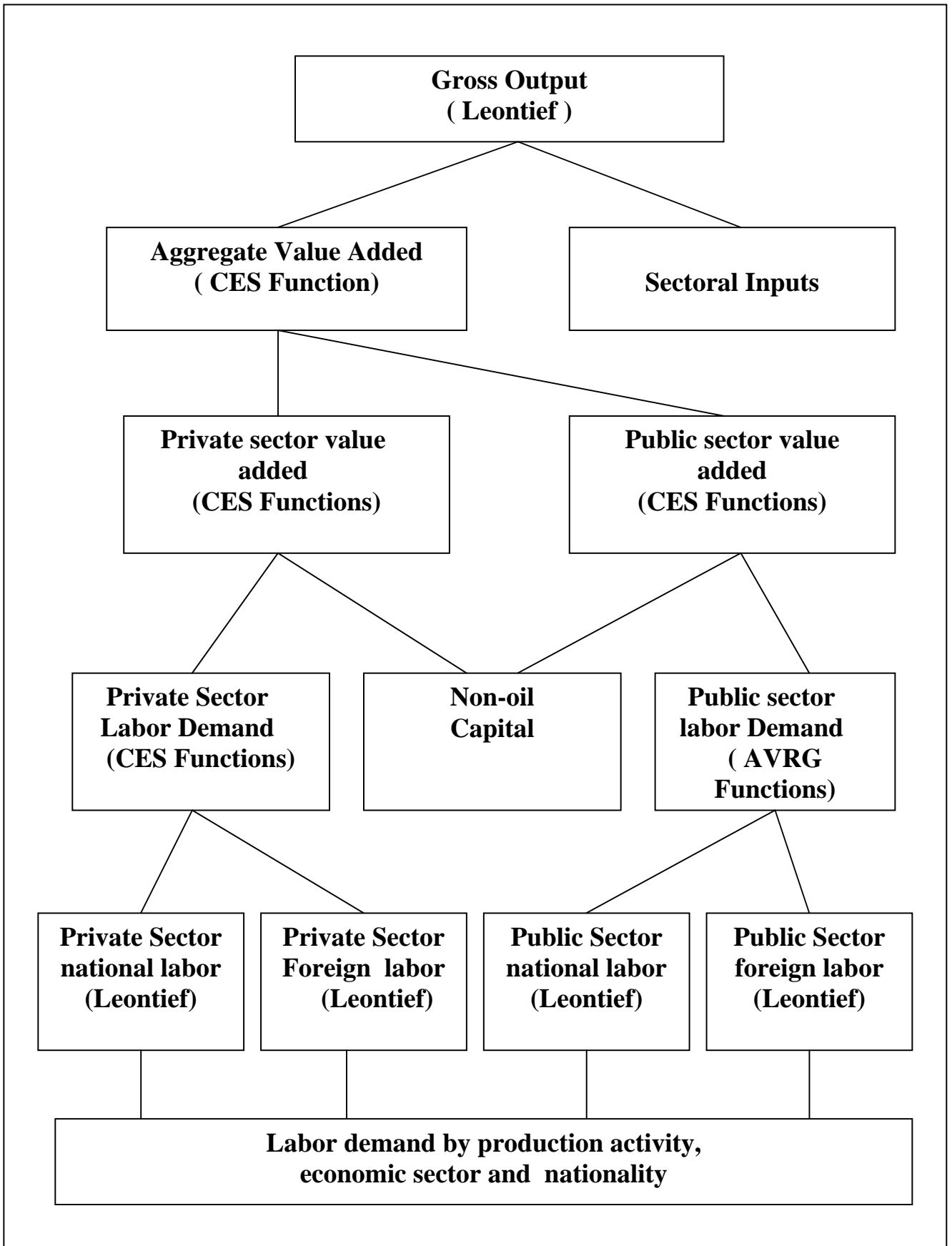
#### **Production decisions:**

In the production sphere of the economy, oil output is taken to be supply-determined and exogenous. It depends on the quota specified by the organization of petroleum exporting countries (OPEC) which is a function of the prevailing conditions in the world oil markets. Inputs of labor and intermediate goods is determined by a fixed coefficients Leontief function. The operating surplus is nevertheless, computed as the difference between exogenous gross output and the remaining inputs. The specifications of non oil sectors assumes that output levels are determined by a profit maximization rule subject to a four-level production function (figure 3). The first level divides output between aggregate value added and intermediate inputs. In the second level, aggregate value added is broken down between private and public production activities. The third level estimates the share of labor and capital in both the private and public value added. Finally, the last level identifies labor demand for national and foreign workers. Depending on the technology adopted in the sector of the GCC economy, the model applies a variety of production functions, such as Cobb-Douglas (CD), constant elasticity of substitution (CES), perfect substitution with average price (AVRG), and so forth. In most production functions, changes in the efficiency of input factors may be introduced in order to allow for the evaluation of alternative scenarios of factor productivity.

#### **Demand for commodities and foreign trade**

In the within period model, aggregate demand for commodities is satisfied by both imports and domestic sales using a composite commodity approach. This approach allows imports to be imperfect substitutes to domestic supply using a cost minimization rule subject to a CES constraint. Given the small country assumption and the open nature of the GCC economies, the supply of imports is assumed infinitely elastic. Supply of crude oil exports is computed as a residual after the satisfaction of domestic consumption needs. Moreover, it is assumed that world demand for oil exports is infinitely elastic. For non-oil sectors, it is assumed that goods produced for domestic sales and exports are imperfect substitutes. This feature is captured by adopting a sales revenues maximization subject to a constant elasticity of transformation (CET) function. This specification of export supply interacts with a set of functions depicting world demand for exports, which depends on the ratio between the world prices and the supply prices in the international markets (the prices received by domestic producers adjusted for export taxes/subsidies and translated into foreign currency).

**Figure(3) Production Technology in non oil activities**



## **Producers of government services**

**In the economy wide GCC prototype model, Government revenues consist of oil sales revenues, public sector operating surplus transferred to government accounts (mainly from petroleum products industry), public investment income from abroad, tax income, revenues from sales of public goods and services and other domestic and foreign transfers. The size of operating surplus transferred to government accounts depends on the profit distribution policy of public enterprises and the extend of the privatization program. Transfers to government from the outside world are fixed in foreign currency and domestic transfers are generally computed as a function of other institutions income. Government income is used to pay public wage bill, purchase goods and services as well as for transfers to other domestic institutions. To capture demand patterns of government employees, public expenditure is broken down into education, health, other social services, public administration and defense and finally economic services. In the within period model, government consumption is fixed in real terms whereas other outlays are fixed in nominal terms. The difference between revenues and expenditures determines the size of government savings (which is computed then as a residual). This part of the within period CGE model permits a one to many mapping relations in order to ensure the required linkages between the government budget accounts on the economy wide level and budgetary variables as recorded in the detailed public finance sub-model.**

## **Households Sector**

**Households account in the model is divided into nationals and expatriates. Households income consists of wage bill, the operating surplus of the unincorporated business and transfers from other institutions (such as welfare transfers from government, interest payment from banks, dividends from private enterprises and so forth). Household's current expenditures are computed as a fixed share of their income with the exception of private consumption expenditure, which is modeled using a linear expenditure system.**

## **Organized companies:**

**In order to capture the dualities in the GCC economies, the model distinguishes private from public companies once as producers of goods and services (in the activities accounts) and once again as part of the income distribution cycle (in the institutional accounts). These two institutions share the operating surpluses from the production activities, with their shares determined by the distribution of ownership at the sectoral level. Furthermore, they receive various types of transfers from domestic and foreign institutions. Nominal expenditures of companies are determined as fixed shares of their revenues. These expenditures generally include direct taxes, transfers to government and other domestic institutions, transfers to the outside world and savings.**

## **Market closure rules:**

**In all CGE-based models, a set of market clearing mechanisms (or closure rules) are required to ensure the consistency of the independent agents decisions on the macro level. These rules, which reflects policy measures adopted in the country of interest, can be classified according to the markets to which they pertain. Therefore the issue of closure appears in: (a) labor and other factors of production, (b) markets of goods and non-factor services and (c) the macroeconomic equilibrium. Product markets consists of crude oil and other non oil commodities. In the crude oil sector, output price is driven by average world prices and total supply is fixed by the OPEC quota. The price and the domestic demand schedule determines the quantity consumed in the domestic markets and exports clear the market. It is computed as the difference between the fixed supply quantity and the domestic consumption. In the remaining product markets, exchange takes place at the flexible market-clearing prices. In the suggested prototype economy wide model, the exchange rate is assumed to be fixed. Foreign borrowing is assumed to cover any deficit in the balance of payments. In practice, the GCC countries realize a surplus in their balance of payments which is generally channeled to the outside world in the form of additions to the assets held abroad. The magnitude of this surplus is however affected by the fluctuations in oil prices, the international interest rates on foreign assets and the balance of government accounts.**

**On the macroeconomic level, savings of households and companies are computed as a fixed share of their nominal income whereas government savings are estimated as the difference between public revenues and current spending. Given aggregate investment expenditure, which is considered a policy variable, foreign savings are determined as a residual. It may be noted that, following Walaras law, the saving-investment balance is guaranteed given that the rest of the world is in equilibrium. In this case, foreign savings play the dual role of bringing the current account, as well as savings and investment into balance. In the GCC countries, given that domestic savings generally exceed investment expenditures, foreign savings appear with negative value to reflect a net lending to abroad.**

### **4.3.2 The inter-period dynamic relations**

**In addition to the central static CGE model, the overall structure of the prototype model, explained in figure (1), includes an inter period dynamic sub-model, a disaggregated labor market sub-model and a public finance simulation sub-model. The inter period variables are generally determined by exogenous trends or by dynamic adjustment relations with lagged variables. In the prototype model, the first category comprises variables such as investment expenditures, Public final consumption spending, crude oil prices and production level, government transfers to domestic institutions, tax and subsidy rates, changes in factors productivity and so forth. The second category of the fixed within period variables are adjusted over time using dynamic relations. The main dynamic relations to be incorporated in the prototype model are national and expatriate population**

growth, physical capital stock updating equations and foreign assets management system. The dynamic updating of labor market variables is nonetheless carried out in the labor sub-model. The national population size is adjusted between periods using an exogenous natural growth rate whereas expatriate population depends on the demand for foreign workers coupled with the prevailing dependency rates (which is considered as one of the population policies in the model). Non-oil capital stocks are updated using investment expenditures by destination and depreciation rates by sector. Finally, foreign assets in the model are divided between private and public sectors and they are dynamically updated based on the base year levels, the average world interest rates and the part of government deficit financed by these assets (in case of government investments abroad). In fact, the selected breakdown of these assets depends on the patterns of ownership and the adopted asset management policies. In the case of Kuwait, for example, public sector foreign assets are generally divided into the general reserve fund and the future generation reserve fund in order to capture the differences in their accumulation process and management rules (Khorshid 1998).

#### **4.4. Relations of the labor market sub-model**

Labor market's supply and demand forces in the prototype model are analyzed by nationality (nationals versus expatriates), economic sector (private versus public workers) and production activities (oil and non oil sectors). The economic rationale of the proposed model needs to reflect the following constraints and policy means.

- 1. The supply of national workers depends on their growing population size and an exogenous participation rate. The level of participation is affected, on the one hand, by government policies directed to increase the involvement of nationals in the economic activity and influenced, on the other hand, by the prevailing economic and social circumstances of the country. Government policy measures are generally reflected in the educational, training and reorientation programs in additions to the incentives given to national females to join the labor force.**
- 2. Given the current development trends to privatize part of the public sector activities and redefine the role of general government as the main employer of the national labor force, the supply of national workers to the government establishments is assumed exogenous policy variable in the model.**
- 3. Given the nature of the private sector activities and the orientation of GCC governments to encourage the private initiatives, it would be reasonable to assume that the demand for both nationals and expatriates in this sector is determined by economic criteria (profit maximization, cost minimization and so forth). The model assumes, nevertheless, that the governments of the GCC countries will adopt both financial and non-financial incentives to enhance the participation of nationals in the private activities and increase the number of jobs offered to nationals by the private sector (see section 2).**

4. The model distinguishes two categories of the foreign labor engaged in the private sector. The first category consists of foreigners working in the organized private sector and its size is fully determined by economic factors. The second category includes foreign workers hired as domestic helpers in the national household sector. This latter category (which accounts for more than 25 percent of the national population in the case of Kuwait) is computed as a function of the size of national population and the income level of national households.
5. Given the considerable increase in the supply of national labor, the decline over time of substitution possibilities of non nationals in the government sector, the policy directives to privatize part of the public establishments and the expected decrease in the number of jobs offered to nationals by the public sector, one would reasonably assume a gradual increase in the number of national job seekers directed to the private activities. Accordingly, the expected unemployment level of nationals becomes a function of the success of government policies to increase their participation in the private sector activities.

Based on the above economic rationale, the functioning and closure rules governing these labor markets is based on the following economic rationale illustrated in figure(4):

The projected size of national labor force is computed as a function of the population size, the prevailing participation rates and the adopted educational and training policies. Given the selected government employment and wage policies, the outcome of the privatization program and the applied labor substitution measures, the projected number of nationals working in the public sector is determined. Accordingly, the difference between total labor supply and the demand for nationals in the public sector represents the number of nationals seeking jobs in the private sector. The total demand for labor in the public sector comes from the exogenous government final consumption expenditures and the demand for expatriates is then computed as a residual. Demand for foreign domestic helpers depends however on the population size and the average income level in the households sector of nationals. Aggregate demand for labor in the organized private sector is considered as a function of a number of economic factors such as; the quantity of private investments and other demand management policies, the level of factors efficiency, the outcome of the privatization program and the adopted production technology. Given the direct and indirect government policies to increase the participation of national labor in the private sector, the repartition of the total number of offered jobs among nationals and expatriates can be determined. The interaction among the supply of and the demand for nationals in the private sector provides estimates for their unemployment rates. At this stage of the analysis, the summation of the demand for foreigners in the private, public and household sectors determines an estimate of total expatriate labor force. When non-national's dependency rate are considered, the size of the expatriate population can be computed.

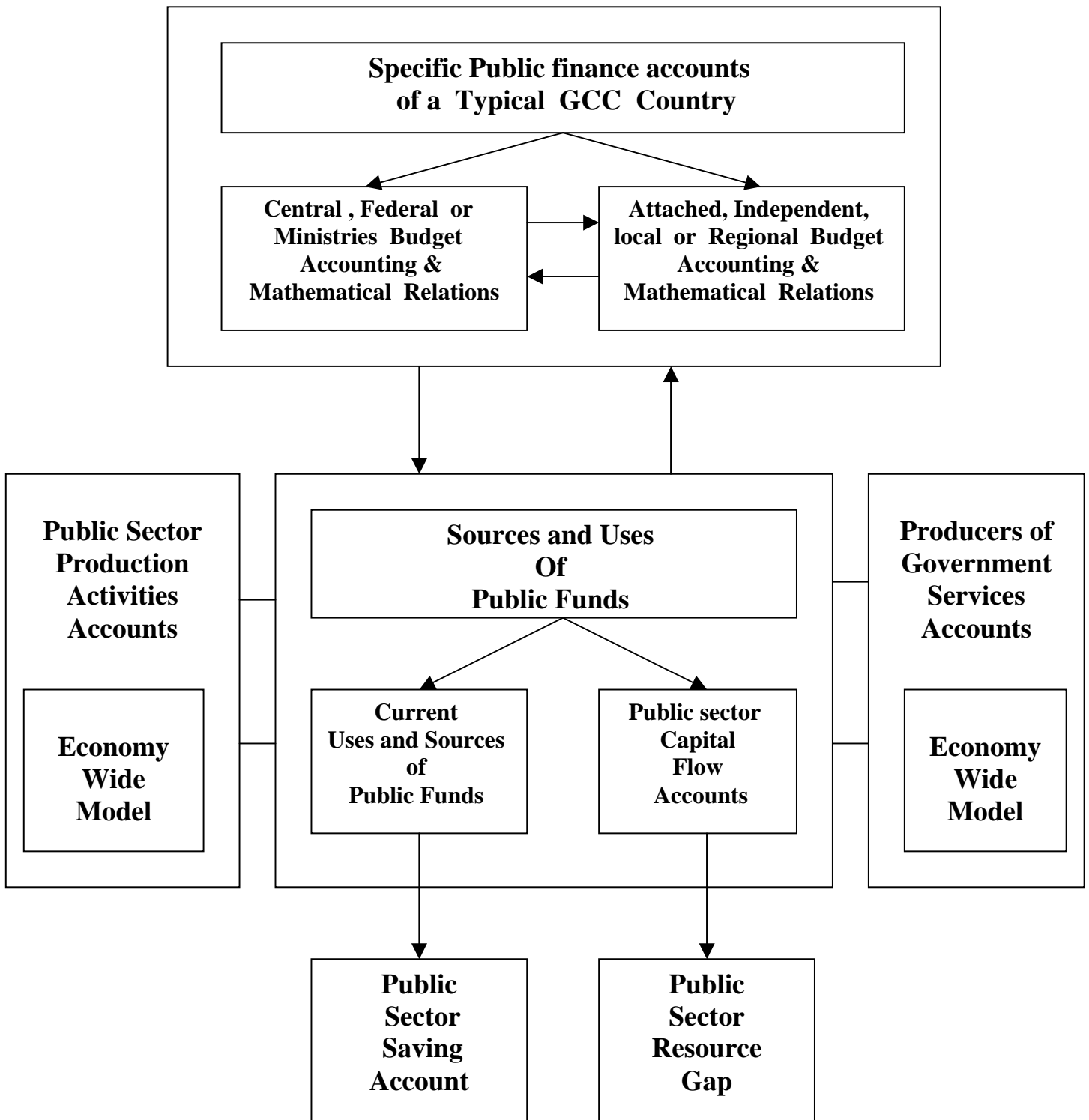


#### 4.5. Public Finance Sub-model

The following points describe the general economic rationale governing the mathematical formulation and the accounting relations of the public finance sub-model:

- To satisfy the adopted strategy of diversifying the sources of public income and reducing the dependence on oil revenues, the GCC countries need to restructure and reevaluate their public fees and tax systems. To capture the impact of these proposed fiscal measures on government deficit and the macroeconomic performance, detailed relations of the sources of government income should be embodied in the public finance prototype sub-model.
- The increase in public revenues resulting from these fiscal measures depends not only, on the suggested changes in the fees and tax rates, but also on the expected response of the consumers to these changes, as reflected in the economy wide sub-model. Given the difficulty to include this level of detailed relations in the within period CGE model, an econometric model is constructed for this purpose as part of the public finance sub-model.
- Government accounts in the economy wide model and its SAM database are classified according to the United Nations system of national accounts (UNSNA). The UNSNA distinguishes production activities owned by government (such as agriculture, industry and productive services) from the producers of government services (such as health, education, public administration, defense and so forth). Accordingly, the SAM and the economy wide model separate public enterprises from general government services. This general criteria is not necessarily adopted in preparing government budgets as part of the public finance accounting relations. For example, the Kuwaiti government prepares three types of budgets which do not necessarily conform to the UNSNA conceptual design. These are the budget of ministries, the attached budgets and the independent budgets. Public finance data pertaining to the public authorities are recorded in the attached budgets whereas the independent budgets include the accounts of public enterprises. On the other hand, public finance system in the UAE is broken down into the federal government in Abu Dhabi and the governments of the seven emirates. In both countries, the public finance sector and its accounts are different from the government data recorded in the national accounting system.

Given the above economic rationale, the public finance model needs to establish the linkages between government accounts produced by the ministries of finance (MOF) in the GCC countries and their representations within the economy wide accounting framework. In figure (5) below, the specific budgetary relations of a typical GCC country



**Figure(5) Components of the Public Finance sub-model  
And Its Linkages with  
the Economy Wide Central Model**

are first computed in the public finance sub-model. These accounting relations reflect the particular features of the public finance sector of the GCC country of interest. For instance, the Kuwaiti accounts are broken down into the ministries budget and the attached and independent fiscal variables. In the UAE, we need to deal with the federal budget and the separate budgets of the emirates. In case of Saudi Arabia (SA), a breakdown of the government budget by geographic region might be required for analytical purposes. As shown in figure (5), these country specific relations should be matched with the public finance accounts generated by the economy wide model based on the UNSNA concepts. This step ensures the proper linkages between the public finance sector and the macroeconomic variables of the country. The outcome of this merging process will lead to the computation of the sources and uses of public sector entities. From an economic point of view, two balancing variables are derived for policy evaluation purposes. These are the government saving account and the public sector resource gap. The first indicator reflects the share of government savings in aggregate national savings and its capacity to finance public sector investments whereas the second one illustrates the size of funds needed to close the public sector resource gap.

## **5. A Specific Model for Kuwait**

To test the analytical capabilities of the proposed GCC issue-oriented tool, the prototype structure is converted into a specific model for Kuwait and used to project the economic performance under alternative fiscal reform measures and labor market policies. We begin with a brief description of the specific Kuwaiti Model and then with the policy analysis exercise.

### **5.1 Basic Structural features**

To move from a prototype to a specific country model, the following steps are carried out: a) adjust the prototype modeling structure to reflect the specific features of the country of interest. These specific features are generally concentrated in the government finance accounting system and some economy wide characteristics. In developing the model of Kuwait, for example, the interactions among the budget of ministries and other attached and independent budgets need to be clearly structured. In addition, the breakdown of public foreign assets into the general reserve and the future generation funds could be useful from analytical purposes, b) determine the level of aggregation of both the economy wide accounts and the sector specific sub-models and finally c) estimate, calibrate and implement the model on computer.

The Kuwaiti model represents an economy with two production activities (oil versus non oil sectors), three economic sectors (public and private enterprises and the producers of government sector), six institutions (Kuwaiti and expatriate households, private and public companies, general government services and the outside world). Commodities are broken down into composite, domestic, imported, exported and re-exported goods and services. These accounts are organized in a SAM consisting of 50 accounts

representing the production activities, the commodity markets, the factors of production, the domestic institutions and the outside world. According to the SAM principles, the rows represent the income patterns of economic actors whereas the columns reflect the spending elements of these actors. Given that the data of the SAM are grouped into a square matrix, each economic actor is assigned one row and one column, respectively. Each non empty cell of the SAM represents then a payment from a column (an economic agent) to a row (another economic agent).

With respect to the labor market accounts of Kuwait, the model distinguishes Kuwaiti from non-Kuwaiti workers along with their sectors of employment (general government, public enterprises and private sector). Furthermore, labor demand in both the private and public sectors is broken down by production activity whereas the workers in the government sector are distributed on different public services (education, health, public administration and so forth). The public finance accounts are highly detailed in the model and they are divided into general government, attached and independent budgets as well as the consolidated sources and uses of public funds.

## 5.2. Definition of Scenarios

In this and the subsequent sections, the constructed model is used to simulate the performance of the public finance system, the labor markets and the whole Kuwaiti economy under alternative scenarios during the period 2000-2005. The main purposes of this experimental analysis are: (i) to study the Kuwaiti economy in the absence of new policy measures or assuming that the same policies adopted during the 1990s will continue to apply. This *reference path* scenario plays the dual role of establishing the base for comparing other scenarios as well as evaluating the degrees of risk associated with the continuation of the current economic trends. (ii) to assess the impact of alternative fiscal reform measures and employment policies on the medium term path of the economy. In this respect, two scenarios are distinguished; the first concentrates on the impact of the fiscal reform program endorsed by the Kuwaiti government in 1999 and the second one trace the effects of a specific employment policy. In the following paragraphs, we begin with the results of the fiscal reform program and then with the impact of the selected employment policy.

## 5.3. Impact of the fiscal reform Package

Against the recent post Gulf war deterioration in both public finance and macroeconomic performance, the Kuwaiti government decided, in the mid 1990's, to adopt a new development strategy directed to eliminate government budget deficit and restore public sector assets held abroad as a necessary initial step towards reducing other structural imbalances prevailing in the economy. To achieve this purpose the Kuwaiti government formulated two successive five year plans (1995-2000 and 2000-2005) and endorsed, in 1999, a comprehensive fiscal reform program directed to increase non oil public revenues and cut down public spending.

The program aims at finding alternative sources of increasing public revenues and controlling government spending so as to improve Kuwait's capacity to support future requirements of health care, education, housing and other social programs provided to Kuwaiti citizens.

Given the above economic rationale, the fiscal reform program adopts the following measures:

a) adjust the prices of government produced goods and services to reflect the cost associated with their production. The areas of application include the following:

- Prices of electricity and water distributed to the commercial, industrial, government and households sectors. The adopted prices depend on the type of the consuming sector as well the level of consumption.
- Fees collected on health care and medication services in inpatient hospitals and outpatient clinics.
- Telephone and post fees for households and commercial sectors.
- Prices of oil refined products sold in the domestic markets such as; regular and premium gasoline, kerosene and diesel products.
- Rents of government owned land and buildings for industrial and commercial uses.

b) increase the cost of most fees collected by the ministry of interior such as car licenses, driving licenses, passport renewal and departure fees.

c) increase indirect tax rates levied on selected categories of imported goods, 180 type of fees collected on services provided by the ministry of commerce and industry as well as permits of domestic servants importing offices and private health clinics.

Results of applying the adopted fiscal measures are summarized in tables 1 and 2. Table (1) shows the expected increase in public revenues due to applying the suggested fiscal package and table (2) captures the resulting economy wide impact.

### **5.3.1. Impact on Public Revenues**

The proposed fiscal program includes several measures directed to diversify the sources and magnitude of public income. These measures are concentrated in the pricing of public goods and services as well as the rating of import taxes. Table(1) summarizes the changes in non oil public income of the general government budget resulting from the application of the fiscal package during the fiscal years (1998/1999- 2004/2005). These changes can be delineated as follows:

- The fiscal program contributed to increasing non oil revenues from KD 445 million in 1998/99 to about KD 1051 million in 2004/2005, with an average annual growth rate of 22.7 percent.

- The suggested fiscal measures succeeded to augment the share of non oil revenues in total public income from 14 percent in the base year to an average of 21 percent in the terminal year.
- The income from sales of public goods and services (commonly known in Kuwait as public services revenues) is responsible of the largest part of the increase in public revenues. Based on the results of the model, the increase of this income category represents 68 percent of the overall growth in public revenues (about KD 393 million).
- The increase in tax income results only from the augmented import duties (KD 210 million). No change is observed during the projection period in the direct tax income.

To sum up, the suggested fiscal reform program relied mainly on adjusting the prices of publicly produced goods and services (services revenues) to achieve the target of diversifying public income. Tax policies, as an important component of any fiscal program, are practically absent in the Kuwaiti proposed package.

### 5.3.2. Economy Wide Effects

The improved performance of public savings, under the fiscal reform scenario, leads to a similar amelioration in the level of national savings. Compared with the results of the reference path, the fiscal package increases aggregate national saving from KD 4967 million to around KD 5325 million in 2005. Similar positive effects are observed with respect to the balance of trade, surplus of the current account and net factors income from abroad. In fact, the ameliorated performance of public investment income, the additional non oil public income generated from the fiscal program and the continuing policy of controlling government spending are the main factors responsible for such reduction in the resource gaps. As a percent of GDP in 2005, the fiscal program contributed to increasing the national savings from 45 to 48 percent, the surplus on the current account of the balance of payments from 32 to about 34 percent and the net factor income from abroad from 15.5 to 21 percent.

Because the adopted fiscal measures contribute to increasing the prices of goods and services, the demand for commodities and the levels of economic activity are expected to decrease gradually. In this respect, the results show a decline in average annual growth rate of real non-oil GDP from 2.34 percent in the reference path to only 2.18 percent due to the application of the fiscal reform scenario. The private sector was more sensitive than the public activities to this increase in prices. The estimated drop in the average annual growth rates of the two sectors during 1999-2005 was 6.9 and 5.5 percent, respectively. The Projections of the model illustrate also that the final demand vector, in general, and the private consumption expenditure, in particular, are the main contributors to this decline in GDP. As a percent of GDP, private final consumption in real term has declined from 56 to 52 percent at the end of 2005 due to the adoption of the fiscal reform program.

**Table(1) Expected changes in public income  
from applying the fiscal reform \***

<b>Public Finance Indicators (KD Millions)</b>	<b>Base Year (1998/1999)</b>		<b>Terminal Year (2004/2005)</b>		<b>Average Annual Growth (%)</b>
	<b>Value</b>	<b>Percent (%)</b>	<b>Value</b>	<b>Percent (%)</b>	
<b>A. Oil Income</b>	<b>2681</b>	<b>86</b>	<b>4019</b>	<b>79</b>	<b>8.3</b>
<b>B. Non-oil Income of which :</b>	<b>445</b>	<b>14</b>	<b>1051</b>	<b>21</b>	<b>22.7</b>
• <b>Sales of Goods and Services</b>	<b>288</b>	<b>9</b>	<b>681</b>	<b>13</b>	<b>22.7</b>
• <b>Indirect Taxes</b>	<b>126</b>	<b>4</b>	<b>336</b>	<b>7</b>	<b>27.8</b>
• <b>Direct Taxes</b>	<b>30</b>	<b>1</b>	<b>33</b>	<b>1</b>	<b>1.7</b>
• <b>Capital Income</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>
<b>Total General Government revenues</b>	<b>3126</b>	<b>100</b>	<b>5070</b>	<b>100</b>	<b>10.4</b>

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\* Represents total Income of general budget government - it does not include public investment income from abroad

The application of the fiscal reform measures has generated varying effects on welfare indicators. The model projections show a decline in per capita real GDP and per capita household income whereas per capita GNP improves under the fiscal reform scenario (see table 2). Given the drop in real GDP, demand for commodities and the size of households disposable income coupled with the increase in population size, the per capita GDP in 2005 declined from KD 3386, under the reference path, to about KD 3282 when the fiscal reform scenario is adopted. On the other hand, the improved performance in net investment income from abroad has contributed to increasing the per capita GNP in current prices from KD 4958 to KD 5043 in 2005. Since a major purpose of the proposed program is to restore public sector investments held abroad, the per capita Kuwaiti foreign assets is expected to increase considerably by KD 2753 in 2005, as an outcome of adopting the fiscal measures.

The concentration of Kuwaiti workers in the public sector and their limited participation rates in the private activities represents one of the major current concerns of the Kuwaiti government. Given the negative impact of the fiscal reform program on the future level of economic activity and the pattern of demand for goods and services, one would expect a similar impact on the demand for labor in the absence of appropriate employment policies. The labor demand in the public sector is however a function of government employment policy, which is directed to create jobs for Kuwaitis and reduce the reliance on non-Kuwaitis. The impact of the economic slowdown is accordingly more felt in the demand for labor in the private sector. The results indicate that unemployment level of Kuwaitis is expected to increase slightly in 2005 from 3.6 percent to 3.7 percent as a result of adopting the fiscal reform scenario.

#### 5.4. Private sector employment policy

In this section, the model is used to assess the medium term impact of a selected *private sector employment scenario*. As indicated above, the reference path and the fiscal reform scenarios assume that the government will continue to adopt the same employment policies and development choices of the 1990s. The results of these two scenarios have demonstrated that the labor market structural imbalances will continue to deteriorate during the next five years (see table (2)).

The *private sector employment* scenario represents a set of policies directed to enhance the participation of Kuwaitis in the private sector (based on some or all of the policy measures explained in section 2.3). Accordingly, the main thrust of this Scenario is to consolidate the current government efforts to increase the participation rate of Kuwaiti labor force in the private sector activities as a way to resolve one of the major imbalances of

**Table (2): Economy-Wide Impact of the  
Fiscal Reform Program**

Economy Wide Indicators (KD millions)	Base Year 1999	Year 2005					
		Reference Path			Fiscal Reform		
		Value	Percent of GDP (%)	Average Annual Growth(%)	Value	Percent of GDP (%)	Average Annual Growth(%)
<u>Generation of National Income</u>							
• Oil GDP*	3138	3138	33.8	0	3138	33.9	0
• Non-Oil GDP*	5398	6155	66.2	2.34	6106	66.1	2.18
• Private*	2688	3176	34.2	3.03	3143	34.0	2.82
• Public*	2710	2979	32.0	1.65	2963	32.1	1.56
• Net factor Income from Abroad	1577	2413	22.0	8.84	2512	22.8	9.88
• Gross National Product (GNP)	10610	13368	122.0	4.33	13535	122.8	4.60
<u>B. Uses of GDP*</u>							
• Private Consumption	4237	4705	51.5	1.84	4458	49.1	0.87
• Public Consumption	2476	2581	28.2	0.71	2581	28.4	0.71
• Exports	4399	4702	51.5	1.15	4695	51.7	1.12
• Imports	3998	4349	47.6	1.46	4149	45.7	0.63

\* Fixed prices of 1995

**Table (2) continued: Economy-Wide Impact of the  
Fiscal Reform Program**

Economy Wide Indicators (KD millions)	Base Year 1999	Year 2005					
		Reference Path			Fiscal Reform		
		Value	Percent of GDP (%)	Average Annual Growth(%)	Value	Percent of GDP (%)	Average Annual Growth(%)
<u>C. Bal. Of Economic Resources</u>							
• National Savings	3006	4967	45	10.9	5325	48	12.9
• Current Acc. Surplus	1870	3505	32	14.6	3838	34	17.5
• Government Deficit <sup>(1)</sup>	-1415	-560	-5.1	-10.1	-93	-0.008	-16.7
• Public Resource gap <sup>(1)</sup>	133	1697	15.5	196.0	2322	21.1	274
<u>D. Welfare &amp; Wealth<sup>+</sup></u>							
• Per Capita GDP*	3,650	3,386	-	-1.21	3,282	-	-1.22
• Per Capita GNP	4,651	4,958	-	1.2	5,043	-	1.4
• Per Kuwaiti Consumption *	3,624	3,523	-	-0.46	3,393	-	-1.06
• Per Kuwaiti Foreign Assets	24,408	29,343	-	3.37	32,098	-	5.25
<u>E. Labor Markets</u>							
• Share of Kuwaitis in Private Sector (%)	1.3	1.29	-	-	1.28	-	-
• Share of Kuwaitis in Public Sector (%)	68.1	79.38	-	-	79.41	-	-
• Unemployment Rate (%)	2.1	3.67	-	-	3.70	-	-

<sup>(1)</sup> Fiscal years (base year 98/99)

<sup>+</sup> in KD

\* Fixed prices of 1995

the labor market in Kuwait, which is the limited participation of national workers in the private activities and their concentration in the government sector. Accordingly, the scenario assumes that the government will gradually increase the share of Kuwaitis in total private sector employees from 1.7 percent in 1999 to about 6 percent in 2005. Note that this share does not account for the expatriate domestic helpers which represents about 30 percent of the Kuwaiti population size. If this expatriate labor category is added to the private sector market, the share of Kuwaitis would further decline to about 1.25 percent only.

The proper implementation of this scenario will necessarily depend on the success of both the private and government sectors to adopt the following measures: a) raise the necessary funds to train and reorient Kuwaitis towards private initiatives and working conditions, b) provide financial support and other incentives to private companies and national household sector involved in this process ( via direct government transfers as explained in section 2.3 ) and c) Gradually decrease the number of Kuwaitis employed in the government sector in order to reduce the inflated public wage bill as a way to overcome the structural imbalances of the budget. It should be noted here that the replacement of expatriates by nationals in the private sector is expected to generate, in the short and medium term, negative effects on total factors efficiency and the cost of production in the absence of appropriate policy measures to counteract these effects.

The economy wide impact of a policy package combining both the fiscal reform program and the private employment policy is illustrated in tables (3) and (4), respectively. The positive impact of this combined policy scenario on the performance of labor market is quite evident. The scenario has positively contributed to reducing the average unemployment rate of Kuwaitis from 3.7 percent under the reference bath and the fiscal reform scenarios to less than 2 percent in 2005 when the private employment policy is considered(see figure (4)). Since the increase in the unemployment rate of Kuwaitis comes mainly from their extremely limited participation in the private activities, this positive outcome can be explained. The share of Kuwaitis in total labor force, under the combined scenario, has also slightly increased from 18.5 to 18.9 percent in 2005. Furthermore, the adoption of the private sector employment policy has generated a more balanced structure of national labor force by economic sector as shown in table (4). In 2005, the share of Kuwaitis working in the private sector to total national labor force increased from 5.5 percent in the reference path and the fiscal reform scenario to about 18 percent when the private employment scenario is adopted. This result constitutes an important move towards achieving a more balanced labor market structure as a major development target in Kuwait's recent five year plan. Despite these considerable improvements in the labor market structure, more effort is still needed in order to achieve a more acceptable share of Kuwaitis in total workers of the private sectors, that exceeds the attained 6 percent

Nevertheless, the merging of the private employment policy with the fiscal reform program has generated negative effects on the macroeconomic

**Table (3): Combined Effects of Fiscal Reform Program and Private Employment Policy on Economic Growth & Public Finance**

Economy Wide Indicators (KD millions)	Base Year 1999	Year 2005					
		Fiscal Reform			Fiscal Reform + Employment Policy		
		Value	Percent of GDP (%)	Average Annual Growth(%)	Value	Percent of GDP (%)	Average Annual Growth(%)
<b>A. <u>Gross Domestic Product (GDP)*</u></b>							
1. Non Oil GDP	5398	6106	66.1	2.19	5979	65.6	1.79
• Private Sector	2688	3143	34.0	2.82	3098	34.0	2.54
• Public Sector	1184	1337	14.5	2.15	1384	15.2	2.81
• General Government	1526	1627	17.6	1.10	1497	16.4	-0.32
<b>B. <u>General Government Spending</u></b>							
• Wage Bill	1299	1689	15.3	5.0	1536	14.3	3.0
• Purchase of Goods	308	305	2.8	-0.16	305	2.8	-0.16
• Current Transfers	2215	2170	19.7	-0.34	2342	21.8	0.96
• Investment	405	493	4.5	3.6	493	4.6	3.6
Total Expenditures	4229	4656	42.2	1.68	4677	43.5	1.76
<b>C. <u>Economic Resource Gap</u></b>							
• General Gov. Balance	-1415	-93	-0.84		-104	-0.97	
• Public Resource Gap	133	2322	0.21		2301	0.21	
• National Savings	3006	5325	48.3		5400	50.2	
• Current Account Surplus	1870	3838	34.8		3912	36.3	

\* Fixed prices of 1995

**Table (4): Combined Effects of Fiscal Reform Program and Private Employment Policy on the Structure of Labor Market**

Labor Market Indicators (in thousands)*	Base Year 1999	Year 2005			
		Fiscal Reform		Fiscal Reform + Employment Policy	
		Number	Percent (%)	Number	Percent (%)
<b>A. <u>Labor by Nationality</u></b>					
• Kuwaiti	210	263	18.5	263	18.9
• Non-Kuwaiti	1033	1163	81.5	1126	81.1
• Total	1243	1426	100	1389	100
<b>B. <u>Kuwaiti Labor Force</u></b>					
• General Government	172	213	81.0	192	73.0
• Public Sector	21	26	9.8	18	6.8
• Private Sector	12	14	5.5	48	18.3
• Un-employed	5	10	3.7	5	1.9
<b>C. <u>Employment Profile</u></b>					
• Public Sector	283	301	100	280	100
• Kuwaiti	193	239	79	210	75
• Non-Kuwaiti	90	62	21	70	25
• Private Sector	695	812	100	800	100
• Kuwaiti	12	14	1.7	48	6
• Non-Kuwaiti	683	798	98.3	752	96
• Domestic Helpers <sup>(c)</sup>	260	303	30.5 <sup>(+)</sup>	303	30.5 <sup>(+)</sup>

\* Figures are rounded to thousands

<sup>(c)</sup> Non-Kuwaitis only

<sup>(+)</sup> Percent of Kuwait population

growth prospects of the country. Based on the projections of the model, shown in table (3), the growth rates of non oil activities have witnessed an overall decline. The average annual growth rate of non-oil GDP declined from 2.19 percent, under the fiscal reform scenario, to around 1.8 percent as a result of adding the private employment policies. This decline in the tempo of growth is the outcome of the following three factors:

- The decline in the efficiency of the private factors of production resulting from replacing skilled foreign workers by less trained Kuwaiti nationals.
- The increase in the cost of production of the private sector associated with the wage differential between Kuwaitis and expatriates. Although, it is assumed that the Kuwaiti government will partly compensate private corporation for the higher Kuwaiti wage rates, the change in the cost structure will still produce its negative impact on economic growth.
- The decrease in the number of national workers and wage bill of the government sector. This effect results from the fact that the suggested private employment policies are generally directed to achieve a more balanced labor force structure for national workers via increasing their participation rates in the private activities and reducing their levels of concentration in the public sector. Since government GDP, as a non profit institution, is composed only of the public wage bill and the consumption of fixed capital, the private employment scenario is expected to negatively affect its growth rates.

Finally, table(3) summarizes the impact of the combined private employment and fiscal reform scenario on the components of government spending. Results indicate that the decline in the wage bill from KD 1689 million to KD 1536 million in 2005 is counterbalanced by the increase in current transfers from KD 2170 million to around KD 2342 million in the same year. Accordingly, the overall impact of the combined policy package on total government spending is almost non significant.

## 6. References

Blitzer, C.R and R. Eckaus (1988) “ An Energy Economic Interaction Model for Egypt”.” *Energy Planning institute, Egypt.*

Cohen, S.I. (1988) “ The Interface Between Population and Development Models, Plans and Policies” *The Pakistan Development Review, Vol.28. Part I: 385-411.*

Decaluwe, B. and A. Martens (1987) “ Developing countries and General equilibrium Models: A Review of the Empirical Literature.” *IDRC Report no. IDRC-MR1556.* International development research Center. Ottawa, Canada.

Dervis, K., J. De Melo and S. Robinson (1982) “ General equilibrium Models for Development policy.” *Cambridge university Press.* New York.

Drud, A., W. Grais and G. Pyatt (1986) “ Macroeconomic modeling Based on Social Accounting Principles.” *Journal of Policy modeling*. Vol. 8. No. 1 :111-145.

Girgis, M. (2000) “ National Versus Migrant Workers in the GCC: Coping with Changes.” Paper Prepared for the Third Mediterranean Development Forum. Cairo, 6-8 march.

Khorshid, M. H. and Y. Al-Ibraheem (2001) “ Analysis of Public finance Policies in Kuwait Using an Economy wide Model” *Arab Economic Journal*, accepted for publication in February (in Arabic).

Khorshid, M and Y. al-Ebraheem (2000) “ The performance of the Kuwaiti Economy Following the Asian Crises: Estimation of Economic Costs and Lost Opportunities. ”*The Arab Journal of Social Sciences*, Volume 7, Number 3, September.

Khorshid, M. (2000a) “ A Prototype Labor Market economic Interaction Model for a Gulf cooperation Council country”, *ERF Seventh Annual Conference*, Amman, 26-29, October.

Khorshid, M.H. (1998) “ An Issue-oriented Multi-sector Economy-wide Simulation Model for Kuwait- Database, Economic rationale and Mathematical Specifications.” Unpublished Report, *The Ministry of Planning*, Kuwait.

Khorshid, M.H. (1997) “ Analysis of Labor Markets Using Economy wide Simulation Models- Theoretical Consideration and Practical Applications.” *Finance and Industry*, The Industrial Bank of Kuwait, No. 15:pp 7-68.

Khorshid, M.H (1994a) “ A Multi-sector Population Economy-wide Simulation Model for Egypt.” *Finance and Industry*. The Industrial Bank of Kuwait. No. 12: 39-155.

Khorshid, M.H. (1994b) “ A Dynamic Multi-sector Economy-wide Model for Egypt: Database, Structure and Policy Analysis.” *The IBK Papers*. The Industrial Bank of Kuwait. No. 41: 1-68.

Khorshid, M.H. (1991) “ A Social-accounting-matrix-based Long-term Model for a Gulf Cooperation Council Country.” *Economic Systems Research*, Vol. 3. No. 3 : 229-313.

Khorshid, M. H. (1990) “ A Dynamic Macroeconomic Model for Kuwait- Analysis of the Medium-term Path.” *Energy Economics*. Vol.12. No. 4: 289-301.

Khorshid, M.H. (1985) “ The Computerized TV Approach to Economic Modeling: An application to Egypt.” *The IBK Papers*. The Industrial Bank of Kuwait. No. 18.

**Pyatt, G. and J. Round (eds) (1985) “ Social Accounting Matrix: A Basis for Planning.” *The World Bank. Washington. D. C.***

**Rattso, J.(1987) “ The Macroeconomic performance in India 1980-1985: An Applied General Equilibrium Analysis.” *Journal of quantitative Economics.* Vol. 3: 225-258.**

**Robinson, S. (1991) “ Macroeconomics, Financial variables and Computable General equilibrium Models” *World development.* Vol.19. No. 11: 1509- 1522.**

**Robinson, S. (1989) “ Multisectoral Models” Chapter 18 in Chenery and T. Srinivasan.(eds) *Handbook of Development Economics.* Elsevier Publishers. Amesterdam.**

**Sirageldin, I. And M.H. Khorshid (1996) “ Human Resources Development and the Structure of Oil economies: Critical Issues with Illustration from Kuwait.” *Research in Human Capital and Development.* Vol. 9: 49-78.**

**Taylor, L. (ed), (1990) “ Socially relevant policy Analysis : Structuralist CGE Models for the Developing World.” *MIT Press.* Cambridge.**

**United Nations (1992) “ Integrating Development and Population Planning in India” New York.**

**United Nations (1981) “ Population and Development Modeling.” *Proceedings of the UN/UNFPA Expert Group Meeting.* Geneva.**

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