The oil position in the Tunisian economy: Adaptation of computable general equilibrium model

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Abstract

This article presents several preliminary results of the real prices application on the Tunisian economy through a dynamic computable general equilibrium model.

The objective is to assess the effects of the progressive dismantling policies of oil products subsidy on the economic growth, the sectoral dynamics and, to a lesser extent, on the household incomes. The simulations on the crude oil price and on the subsidies granted to oil products have redrew new structures of the prices and have modified their levels. The analysis of the impacts of this simulation studies the effects of these new prices data on the economic agents and on the economy in general.

Keywords: , Computable General Equilibrium Models, Taxation, Subsidies, Revenue, Energy, Government Policy;
JEL classification: C54, C68, D58, H20, Q48;

1. Introduction

The interaction between the energy system and the economy seems highly variable in time and space since, numerous factors interfere such as the production structure, the used technology, the energy guiding price, the regulations in force, the agents' behavior, the climate, the urban planning etc.; indeed, the energy is first considered as a production factor or an intermediate product used in the productive process with a rather complex technological composition. It is similarly considered as the final product to be consumed through the recourse to equipments having different efficiencies according to their agent and their use.

Thereby, within the framework of this analysis the computable equilibrium model seems to be an important element of the closed-loop process of the economic growth, the energy demand, the energy costs and the economic growth. In other

words, to exactly prospect the effective economic policy, in the long term, it is necessary to choose a structure which captures all the oil price effects on the economy.

One of the inherent objectives of this chapter is to acquire a good knowledge about the structure of the Tunisian economy, and to pay attention to a new vision at the level of the mechanisms and the fundamental concepts (economic, financial, technical, political, etc.). A general discussion of the methodology shall be therefore carried out.

2. Prsentation du secteur des hydrocarbures en Tunisie

In Tunisia, the energy prices are negotiated between the Ministry of Industry and Technology, the Ministry of Finance and the Ministry of Trade. The amount of the subsidies granted by the State pursuant to oil products, natural gas and electrical energy subsidy is annually fixed by the Finance Act, on the basis of the barrel price assumption. The State observes the evolution of the import prices and on this basis it revises these prices in order to insure the financial equilibrium of the public operators. In connection with each adjustment of oil product price, a price structure is established, which clarifies the sale price, the amounts of the subsidies and the various taxes.

2.1. Demand Analysis

The demand of primary energy have progressed during the last 15 years from an average of +3,7 % per year to reach 7,2 millions toe (Mtoe) in 2005. The entirety (99,4 %) of this consumption has been covered by liquid and gas hydrocarbons.

Table 1: Evolution of the energy consumption structure in Tunisia by energy form in 2005

	1980(ktep)	Distribution in (%)	2005 (ktep)	Distribution in (%)
Oil products	2 577	83.9%	4 209	55.9%
Natural gas	404	13.1%	3 278	43.5%
Coal coke	89	2.9%		
Hydro-power/wind power	3 01%	46		0.6%
Total excluding biomasse	3 073	100%	7 533	100%

Source: General Directorate of Energy (GDE)

In volume, oil products represent 55% of the national consumption of commercial primary energy against 69% ten years earlier. This relative reduction is said to a strong growth of natural gas consumption. In 2005, the primary energy consumption was 7,3 Mtoe; decomposed as follows: 55,9% oil products and 43,5% gas (Table 1).

Oil products constitute an important part of final energy consumption for all the sectors: in 2004, the part of oil products in final energy consumption, for the various sectors of use, levels 42% for the industry, 57% for the residential, 59% for the tertiary sector, 87% for the agriculture and 99% for the transport.

The diesel represents 47% of the national demand of oil products. The pattern of the consumption by sector of use is distributed as follows: the transport represents almost the half of the domestic consumption of oil products, industry 20,7%, the residential sector 20,7%, agriculture 9,4% and the tertiary sector 9,4%. (Source GDE)

2.2. total Balance of hydrocarbon

During the last two decades, while the demand of primary energy has increased with an average of +4% per year, the national production of hydrocarbons has remained between 5 and 6 Mtoe. The national production of crude oil peaked in 1984 to 5,5 Mtoe. This production has therefore declined to reach 3,5 Mtoe in 2005. This decline has been compensated by the production of Miskar gas field since 1996. After three decades in surplus, the energy balance of Tunisia became deficit since 2001. In 2006, the deficit has been of 960 ktoe, corresponding to a demand coverage rate of 87%. In 2005, the net imports amount of oil and gas was 0,8 Mtoe equal in value to 511 million dinars and to an energy dependency ratio of 11%. The trade balance of the energy sector was positive since the start-up of El Borma field, in 1966, until the end of the eighties. Since 1990, the balance of trade of the energy sector has been deficit and has therefore gradually deteriorated. During the last ten years, the production has been inferior to the national consumption for all the oil products. In 2005, the net imports of oil products have amounted to 2,1 Mt against 1,3 Mt ten years earlier. In 2005, the dependency ratio, the report between the net imports and the national consumption of oil products, has been 52%, against 42% ten years earlier. The diesel represents 59% of the oil products net imports. (Source: GDE)

2.3. Organization of the energy system in Tunisia

2.3.1. The Tunisian Company of Petroleum Activities (ETAP)

The Tunisian Company of Petroleum Activities has been created by the law No.72-22 dated 10 Mars 1972 with the aim of managing the exploration and the production of hydrocarbons. The main activities of ETAP are the exploration, the production, the marketing and finally the oilfield services activities such as the geological, seismic and reservoirs studies. The research and development studies are directly realized by the private investors and at their own risk. For these thirty years of activity, we notice that ETAP was not able to directly realize neither a discovery, nor a development or hydrocarbons field operation. The concessions are exploited either by the private investors or by the joint venture companies created

in association with ETAP. Unlike, the other energy or mining activities (electricity or phosphate for example), the national companies were able to complete their missions of national operator. On the international level, the state-owned companies, similar to ETAP, have managed to develop in their country and abroad like in Croatia, Hungary, Malaysia or Turkey.

2.3.2. Tunisian Company for Refining Industries (STIR)

With respect to oil products, the refining activity is insured by the Tunisian Company for Refining Industries (STIR). STIR was created in 1961 within the framework of an agreement between the Tunisian State and the Italian group ENI. Following the acquisition of the foreign participation by the Tunisian State in 1975, STIR became a public enterprise. The objectives assigned to STIR are crude oil refining in order to partially satisfy the needs of the local market in oil products. These products are governed by a taxation system in order to insure the stability of the local prices and to protect the consumer's purchasing power. Since 1999, STIR has been the leader in supplying the internal market in oil products (with the exception of the aviation kerosene). Besides refining, STIR insures the import activity of oil products.

2.3.3. Oil market Operating

The sale prices of crude oil of ETAP and STIR are administered, they are even international prices. The production costs of STIR are higher than CIF prices and the Mediterranean Sea. The administered sale prices of STIR to the distributors are lower than the international prices.

Simply, the downstream of the oil market from operating until the refining is insured by ETAP and STIR. The national production of crude oil is mainly exported by ETAP and by the international operating companies. However, to insure the needs of Bizerte Refinery, ETAP annually imports about 1,1 Mtoe of crude oil.

2.4. Pricing structure

We shall examine here the pricing structures of oil products, their evolution, the taxation and subsidies system as well as the possible distortions stemming from this pricing system (Table 2 and 3). The oil products are subsidized at various stages of the processing and marketing chain:

- the administered sale price of crude oil at ETAP and STIR, is lower than the international prices.
- the cost prices of STIR, in the case of an application of the international prices of crude oil purchase and oil products sale, would have engendered the estimated losses at 252 700 MDT en 2005.

- the administered sale prices of STIR oil products to the "investors", are lower than the CIF prices.

Table 2: Refining activity indicators

YEAR	PRICE gross purchasing (D)	BRENT DATE (D)	TURNOVER AFFAIRES (MD)	RESULTS REFINING (MD)
2002	23.6	24.95	528, 988	87, 541
2003	23.6	28.89	559, 512	156, 750
2004	25.5	38.24	471, 222	240, 843
2005	28.5	54.41	724, 488	320, 429
2006	28.5	65.14	889, 297	485, 763
2007	28.5	72.45	1 076, 408	641, 917
2008	28.5	96.99	1 348, 222	910, 584
2009	43.2	61.48	1 136, 840	401, 382

Table 3: Import activity Indicators

YEAR	BRENT DATE (D)	TOTAL PURCHASE (D)	TURNOVER AFFAIRES (MD)	RESULTS IMPORT (MD)	SUBVENTION Accorded (MD)
2002	24.95	754, 074	561, 803	-145, 941	58, 413
2003	28.89	810, 861	604, 470	-215, 079	58, 630
2004	38.24	1 176, 922	847, 124	-318, 214	77, 676
2005	54.41	1 616, 567	1 028, 742	-573, 144	252, 700
2006	65.14	1 947, 473	1 407, 642	-530, 908	45, 145
2007	72.45	2 195, 045	1 642, 870	-586, 815	-55, 102
2008	96.99	2 696, 605	1 839, 629	-845, 410	-65, 174
2009	61.48	1 683, 983	1 638, 620	-37, 269	-64, 113

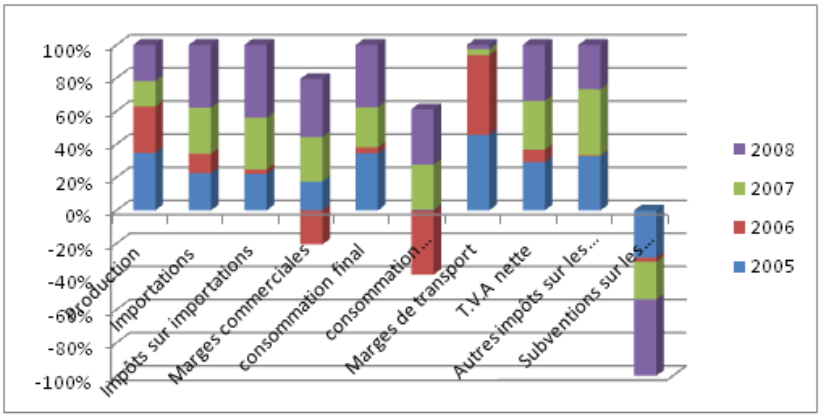
During this decade, we have noticed that the difference between the refining results and the import results is not always negative. Since 2007, STIR pays profits to the account of ETAP in order to subsidize the deficit of the latter. In 2005, the total amount of oil products subsidies (including the deficit of STIR), supported by the State, is estimated at 421,724 MD. All the oil products are subsidized. In terms of volume; the diesel, the LPG and the fuel are the most subsidized products. The subsidy of the diesel is estimated at 209,107 MD in 2005; almost half the total subsidy granted in 2005 to oil products (Table 4).

Table 4: Subsidy per product

Products	subsidy
Natural gas	-6 400
liquified natural gas (steg)	-1 323
Gasoline	-4 213
Gas + kerosene	-209 107
Heavy fuel	-86 576
Butane and propane	-114 105
Total	-421 724

The tax revenues on oil products are distributed between direct and indirect taxes. In 2005 (figure 1), the volume of the collected taxes in respect of oil products marketing is estimated at 428 MTND. Two major taxes are applied; the VAT represents 56,66% of the collected taxes and the rest of the taxation are represented in the form of other taxes. In 2005, the balance sheet (taxation-subsidies) is globally balanced (taking into consideration the deficit of STIR).

Figure 1: of the resource account for oil products



2.5. Les implications de la politique de subvention de l'nergie

Although the authorities had historically justify themselves by adopting the energy subsidy as a part of its political objectives, the subsidies do not seem to be the most effective policy to reach these goals. Particularly, the energy subsidies would entail economic and social costs.

2.5.1. The economic costs

First the efficiency is imperative because the subsidies blur the price signals, by setting the prices at a lower level than that of the consumption opportunity costs and consequently we end by having distorting effects on the investment decisions.

The first mechanical impact of subsidy lies in the overconsumption of the subsidized energy, thereby entailing an increase in the imports' demand or a reduction in the quantity of the exports' available energy. A priori, we can say that the subsidies may thereby result in deteriorating the balance of payments and to increasing the country's dependence facing the energy imports.

The effect of the subsidy on energy prices propagates in all the sectors, particularly the major energy-intensive sectors, and affects their production costs and the prices of the other products. The changes of the relative prices are going to influence the competitiveness of the products on the international markets.

The subsidies decrease the capacity and the incitement to invest in the new infrastructures and in the production capacity. Similarly, the subsidies lead to the deterioration of the financial situation of the state-owned energy companies and results in the under-development of the sector.

The distortions of the prices can similarly entail bad investment choice and a bad inefficient allocation of resources. The energy subsidies would inevitably decelerate the development and the marketing of the new technologies and the other sources which could finally become more economic.

2.5.2. The social costs

The energy subsidies have been introduced for social motives to make the energy, which is an essential necessity, within the reach of low-income groups. The energy subsidies are at the same time, directly and indirectly to the benefit of the households. The direct effect is the earning of the disposable income because of the reduction in the price paid by the households for oil products consumption. The indirect effect can be seen in the reduction in the prices paid by the households for the other products and services arising from fuel cost reduction during the production process.

In practice, however, the advantages of fuel subsidies mainly occur to the high-income groups. Since the subsidy by liter does not vary according to the household income, those who consume most benefit from the biggest portion of the subsidy.

3. The Social Accounting Matrix (SAM)

The social accounting matrix (SAM) implements an accounting framework for the data of the whole-economy. Once established for a given year, it supplies a "shooting" for the economic structure. The elements of SAM are interconnected through a MCEG which represent the conceptual framework and contains the technical and the behavioural relations. The SAM is, thereby, a database which coherently matches the micro and macro-economic information. According to Thorbecke (1985), the SAM constitutes an essential tool to diagnose an initial situation and to systematically organize the data through respecting the accounts

as well as the classification and the relations between the variables which appear in these accounts. The construction of a SAM is based on the fundamental principle of the balance between the resources and the uses in the considered economic system. It constitutes an analysis tool highlighting the structural characteristics of the offer and the demand at the level of business sectors or the institutions. Finally, the SAM in compliance with the National accounting rules allows finding the main macroeconomic aggregates.

There is no final and unique structure for the SAM, first, because of the diversity of the objectives pursued and assigned to it, second, because of the data availability. The retained agreements are thereby the product of these two elements as well as the reasoned choices. Two types of SAM are therefore identified. The first is the macro SAM (Figure 2) which, as its name indicates, offers an aggregated view of the fund flows in the economy and gives a unique total for each account without any peculiarity about its content. The second, is the micro-computing SAM, it proposes more details about the accounts' decomposition according to the data availability and to the study object. The SAM is characterized by its flexibility. It grants a tremendous flexibility in the disaggregated accounts. Although the present matrix is disaggregated enough at the level of the production activities, it nevertheless remains in the family of macro SAM, because it is not the object of a particular disaggregation. The accounts of our matrix represent the same accounts supplied by the national accounts data.

Typically, a SAM in an open economy contains five types of accounts: 1) activities of accounts (or production accounts), 2) products and services accounts (products accounts), 3) factors accounts (labour and capital), 4) accounts of the internal (households, companies, State) and the external (the rest of the world) institutions and 5) savings and investment accounts for all the institutions.

3.1. Data Sources

The SAM of the year 2005 constitutes the database of the model used for calibrating the GCE model. It's a version adapted to the objective of the SAM built by the Institute of Quantitative Economics. The sources of the used data are derived from the input-output table 'IOT', global economy table 'GET' derived from the National Institute of Statistics (NIS) and the balance of payments stemming from the Central Bank of Tunisia.

The input-output table belongs to the family of the economic tables supplied by the national accounting; indeed, it allows having an overall view about the production activities and its use. In other words, it allows figuring the interdependence existing between the various economic business sectors through indicating the products and services falling within the production process of the other products and services and the final uses of products and the services. The 'IOT' has

constituted the main data source for the elaboration of our SAM. The global economic table includes the agents' accounts. It describes the distribution of the factor income, the inter-institutional transfers and the savings between the agents. The data are organized in six accounts: the production account, the operating account, the income account, the use of income account, the capital account and the financial account. The agents of the global economic table are the non-financial companies, the financial institutions, the public administrations, the households and the foreign countries.

The third used data source is the balance of payments. This table shows all the operations which take place during a given period, between a country and a foreign country. The balance of payments is a statistical document developed in the accounting form, listing the flows of products, the services, the income, the capital transfers, and the financial flows which the residents of a country maintain with the rest of the world.

3.2. The Micro SAM

The structure of the SAM depends on the initiated study. The Tunisian Social Accounting Matrix for the year 2005 is composed of 62 accounts with 21 production activities, 22 products, 2 production factors, 4 domestic institutions, 6 taxes and subsidies accounts, 2 savings and investment accounts, 3 accounts for the rest of the World, 1 account for the commercial margins and 1 balance of payments account. Compared with the Macro SAM, the disaggregation is realized for the activities accounts, the products account, the State account, the savings-investment account, the account of the rest of the world and the margins account.

3.3. Activities-products Structure

Within the architecture of the presented SAM, the production contains two accounts "activities of production" and "products and services". This distinction helps capturing the fact that an activity can supply more than a product and similarly a product can be generated by more than one activity.

The disaggregation criteria of the activities are diverse. We shall retain here the disaggregation by sector type (primary, secondary, tertiary). These sectors are therefore more or less disaggregated by product or by product type. The first activity account retained in the SAM disaggregated structure is the primary sector activity (agriculture and fisheries).

Next come five other accounts of non-manufacturing industries, two accounts are relative to the extraction activities of the energy and the non-energy products, the account of the activities of oil and gas extraction and refining, the account of electricity and gas production and supply and finally the account of construction and public works.

The following seven activities accounts strictly correspond to the most energy-consuming production activities which are: the manufacturing industries, coking and refining and the nuclear industries, the chemical industry, the rubber and the plastics industry, machines and equipments manufacturing, electric and electronic equipments manufacturing, transportation equipment manufacturing.

The following activity accounts are four services accounts including the business activities, the tourism activities (hotels and restaurants), the transport and telecommunications activities which are subdivided into: ground transportation, sea and coastal transportation, air transportation, auxiliary transportation services, post offices telecommunication, and the financial activities; rent and business activities. Each of these activities represents an element of products account.

The last activity account is that of the non-market activities. It includes the public administrations which produce public services.

The activities account receives the sales value of the products online, on the domestic and the external markets, paid by the product accounts and uses. It spends the intermediate consumptions which constitute payments for the products accounts, the added value which constitutes a payment for the factors' accounts and the indirect taxes a positive payment for the account of the State and another negative payment for the operating subsidy.

Regarding the products account, the resources of this account are constituted by the corresponding intermediate demand, the commercial margins, the final demand of the households, the State demand, the foreign demand that is the exports and finally, the demand of the investment stemming from the savings-investment account. The uses of the products accounts are constituted by the payment for the activities accounts, by the account payment at the expense of the rest of the world corresponding to the value of the duty free importations, the payment of the commercial margins, the payments of the indirect taxes at the expense of the State. The products accounts can also receive subsidies; in this case, it corresponds to a negative use of the State account.

The payment of the commercial margins is paid at the expense of the commercial service product, which stems itself from the commercial activity. In the case of the Tunisian SAM, only the products pay commercial margins for the commercial account.

3.4. Structure in factors and institutions

The activities produce products and services through combining the production factors[1] and the intermediate products[2]. The factor labour is remunerated

[1]Intersection of the column "production activities" and the line "capital" and "labour".

[2]Intersection of the column "production activities" and the line "products and services"

through the paid gross salaries whereas the gross operating surplus represents the remuneration for the major factor. The remuneration of the production factors constitutes the added value which shall repay the various agents called institutional units.

Among the institutions, the State and the households accounts make the object of disaggregation with respect to the stylized matrix.

For the State account, it allows at the same time to distinguish the various types of taxation, direct and indirect, applying to the different bases of taxation, and to consider the various subsidies applying either to the activities, or to the products, or to the households.

The State receives all the types of taxes (direct and indirect), in addition to a part of the remuneration for the major factor, the companies' dividends finally the foreign agent income; the "rest of the world" in the form of loans or of donations. Thereby, we shall consider six accounts of taxes and subsidies which appears in line or in column and where the totals of which are paid at the State account (for the taxes) or fed by the latter (for the subsidies). The direct taxes apply to the household and companies incomes. The indirect taxes are mainly the VAT and "other indirect taxes". As for the subsidies account, we shall distinguish the operating subsidies of the received activities in the form of negative taxes and subsidies on the products. The State also receives taxes on the imports in the form of customs duties, then, the State consumes a part of its income and makes transfers. The transfers[3] of the State are distributed between social transfers realized towards the households, transfers in the form of subsidies to the companies and transfers to the rest of the world in the form of payment of the contracted debt.

Finally, the representation of the SAM structure, the account "capital accumulation" receives as income the savings of all the agents and its expenses correspond to the investment[4].

[3]intersection between column "State" and the lines corresponding to its agents

[4]intersection between the column "capital accumulation" and the line "products and services".

Figure 2: The Macro Matrix of the year 2005

Macro-Matrice 2005 équilibrée

		capital	travail	activités	produits	Institutions				RDM	accumulation	dirtx	vattx	prdtx	imptx	indtx	Total
						compte courant											
						SNF	SF	ADM.PUB	MEN								
	Capital			22 636 673													22 636 673
	Travail			15 049 575						65 698							15 115 273
activités	activités				72 382 284												72 382 284
produits	produits			34 470 048				7 084 265	25 871 276	18 813 591	8 887 405						95 126 586
compte courant	SNF	7 244 160				0,0	688240,6	555470,2	135583,4	133434,8							8 756 889
	SF	764 727				1650443,7	386376,6	164113,9	896756,7	8870,1							3 871 288
	ADM.PUB	1 276 908				1220392,3	95633,1	425737,1	6540326,2	389646,3		2 960 675	2 307 502	-120 593	575 263	1 232 606	16 904 096
	MEN	13 350 878	15 115 273			239648,8	1679814,5	5968283,2	319479,7	1909248,8							38 582 626
RDM	RDM				18 975 511	1428974,4	301193,2	625868,6	425090,2	0,0							21 756 638
t.capital	accumulation					3026942,0	670385,0	2045279,0	2756245,4	388554,0							8 887 405
	dirtx					1 190 488	49 645	35079	1 637 868	47 595							2 960 675
	vattx				2 307 502												2 307 502
	prdtx			-120 593													-120 593
	imptx				575 263												575 263
	indtx			346 581	886 025												1 232 606
Total/E	Total	22 636 673	15 115 273	72 382 284	95 126 586	8 756 889	3 871 288	16 904 096	38 582 626	21 756 638	8 887 405	2 960 675	2 307 502	-120 593	575 263	1 232 606	

4. The Computable General Equilibrium Model

The implementation of the tools of evaluation and analysis of the energy policy is generally realized in two different abstract frameworks: the partial equilibrium model and the general equilibrium model. The partial equilibrium presents the most specific methods to a sector, and examines particular sectors or products within the economy, without approaching the macroeconomics and the effects of repercussion or feedback stemming from other sectors on the economy. Through exceeding the simplistic framework of the partial equilibrium model, the computable general equilibrium models reveal the interdependence of the various markets and the direct and indirect impact of the exogenous modifications. The most common procedure of general equilibrium modelling consists, as from a supposed SAM in representing the economy in a general equilibrium situation. The general equilibrium model reproduces, the variations which can result from a change in the economic environment[5] and from the adoption of macro-economic politics[6] or micro-economic politics[7].

4.1. The prices and the taxes

The model contains a prices system which allows it to redraw the evolution of the production cost towards the final sale price. First of all, given that the products can be produced by several activities, the production cost of a given product is

[5]Variation of the exchange terms, the world demand change, the drought impact

[6]Variation of the nominal exchange rate, budgetary or monetary reforms.

[7]Fiscal or tariff reforms

a combination of the prices of the activities producing the product. The activity prices include taxes on the production but also all the imputed taxes during the production process. The production cost is equal to the export price (except the transaction costs). The interaction between the production and the export costs determines the price of the domestic offer. Besides, during the sale process, the products prices increase by the transport and the trade margins which are calculated in fixed percentages of each unit sales. The interaction of the sale price with the import price constitutes the composite price of the domestic demand.

4.2. The production

The general structure of the production process supposes that business sectors use the same production technology. The function of global production is a "fitted" function, which uses the same technology. The combination between the value added and intermediate consumptions is operated by Leontief function, what means that each of the added value and the intermediate consumptions represent a fixed part of the production.

The value added of the various business sectors is represented by Cobb-Douglas (CD) function between the capital and the labour. As for the intermediate consumptions which are in the form of the composite products, they are modelled according to the classic plan of the input-output models (fixed technical coefficients).

In this model, we have retained the hypothesis of the capital stock specificity by the business sector and its full use, what excludes any possibility of intersectoral mobility of this factor. The passage from the production sphere to the market sphere supposes that all the manufactured products are sold on the market.

The producers can manage their production towards the domestic or the foreign market. As for the producers' choice between the domestic market and the export, it is specified by a function said "CET" (Constant Elasticity of Transformation) which is characterized by the constant elasticity of transformation, what supposes an imperfect "transformability" between the destinations. Thereby, the maximisation of the profits according to the relative prices leads the producers to distribute their production between the domestic and export markets.

4.3. The institutions

The model contains four types of institutions: the households, the companies, the State and the rest of the world. First, the resources of the households mainly result from the salaries received from the labour factor and by the capital income detained by the individual companies and the transfers of the other institutions[8].

[8]The social-security benefits and other social transfers as well as the other common transfers

After paying the taxes to the State, these incomes are essentially used in the consumption of the products and services, the transfers to the other institutions and the savings which is a payment at the investment-savings account.

The companies' resources essentially come from the capital income detained by the companies, the transfers of the other domestic institutions and from the rest of the World. Their uses are distributed between the affectation of the primary and the secondary income in the form of transfers to the other domestic institutions, the income taxes paid to the State account and the savings paid to the Investment-savings account. The State resources are fed by the taxes and the transfers of the domestic as well as the foreign institutions. The resources are used as transfers intended for the other institutions and for the Rest of the World, and consumption expenditure and paid subsidies. This operation releases a saving which finances the gross fixed capital formation and the stock variation.

4.4. The foreign trade

The foreign trade is modelled according to two hypotheses: the "small open economy" hypothesis and Armington hypothesis. The first implies that the import and the export prices are determined according to the world market and, therefore, constitute exogenous data. Armington hypothesis implies that the imports are the imperfect substitutes of the local production. Thereby, the demanded product at the local market is the composite product constituted by the local production and the imports. The distribution of this composite product is governed by a function with constant elasticity of substitution (CES). The elasticity of substitution (CES) and of transformation (CET) functions determines the sensitivity of the ratios volumes to the variations of the products' relative prices, which are distinguished by origin and destination. In the equilibrium, the trade-off between the imports demands and the local products mainly depends on their relative prices.

Symmetrically, the producers can assign their products between the local market and the export through a constant elasticity of transformation function.

4.5. Model Details

4.5.1. The production

The general structure of the production process supposes that the business sectors use the same production technology. The function of global production is a "nested" function, which uses the same technology. The combination between the added value and the intermediate consumptions is operated by the Leontief function, what means that each of the value added and the intermediate consumptions represent a fixed part of the production.

$$XS_j = \frac{VA_j}{v_j} \tag{1}$$

$$CI_j = \frac{\iota_j}{XS_j} \tag{2}$$

avec :

- XS_j : the production of the business sector j;
- VA_j : the value added of the business sector j;
- CI_j : the intermediate consumption of the business sector j;
- υ_j : the value added coefficient of the business sector j;
- ι_j : the volume of the necessary intermediate input to the production of a product unit j;

The producers choose the production level which allows them to maximize their profit while taking into consideration the factors to be used in the production as well as the prices' general level. In this model, we have retained the hypothesis of the specificity of the capital stock per business sector and its full use, what excludes any possibility of intersectoral mobility of this factor. The producers choose the number of the working units based on the market salaries. The value added of the various business sectors, is represented by Cobb-Douglas (CD) function between the capital and the labour.

$$VA_j = E = A_j * LD_j^{\alpha_j} * KD_j^{1-\alpha_j} \tag{3}$$

The price of the basic value added which gives the factors cost per unit, is specified as follows:

$$PVA_j = \frac{\omega_j * LD_j + r_j * KD_j}{VA_j} \tag{4}$$

The labour demand of the business sector (j) is obtained from first-order conditions of the profit maximization problem.

$$PV_j = PVA_j * (1 + txa_j + tsxs_j) \tag{5}$$

The labour demand of the business sector (j) is obtained from first-order conditions of the profit maximization problem.

$$LD_j = \frac{\alpha_j * PV_j * VA_j}{\omega_j} \tag{6}$$

where

- VA_j represent the value added;

- LD_j the labour demand;
- KD_j the amount of the available capital;
- α_j the elasticity of the value added of the sector production with respect to the labour force;
- A_j the rating scale of the value added of the sector j;
- α_j the salary rate;

The intermediate consumption of each sector j is constituted by the sector demand j in intermediate consumption $DI_{(i,j)}$ according to a fixed relation (Leontief), what supposes the strict complementarity between the intermediate inputs.

$$DI_{(i,j)} = \epsilon 2_{(i,j)} * CI_j \tag{7}$$

with: :

- $DI_{(i,j)}$: the business sector demand j in intermediate inputs i.
- $\epsilon 2_{(i,j)}$: fixed ratios of the intermediate inputs i per sector j.

The production cost incorporating the intermediate consumptions cost is given by :

$$PXS_j = \frac{PVA_j * VA_J + \sum_i PC_i * DI(i,j)}{XS_j} \tag{8}$$

With

- PC_i : The market price of the composite product 'i' sold on the local market.
- PXS_j : the output price.

4.5.2. Supplies and demands of the products and the services

The passage from the production sphere to the market sphere supposes that all the manufactured products are sold on the market.

One of the model peculiarities is that it is a multi- product model. Thereby, each activity manufactures more than a product and each product can be manufactured by more than a business sector. The total supply of the economy in a given product is Constant Elasticity of Substitution (CES) of the amounts produced by all the business sectors. The specification CES is a generalization of the Cobb Douglas function. It implies (as its name indicates) a constant elasticity of substitution, but not necessarily equal to 1 of the various factors.

$$X_i = f(DX_{(1,1)}, DX_{(1,2)}, ...DX_{(i,j)}) = (\sum_j \varsigma_{(i,j)} * (DX_{(i,j)})^{\tau})^{\frac{1}{\tau}} \quad (9)$$

With

- X_i: amount of the product 'i' manufactured by all the production activities;
- $DX_{(i,j)}$: amount of the product 'i' manufactured by the activity sector j;
- $\varsigma_{(i,j)}$: coefficient of the CES of the production per sector;
- τ: elasticity of transformation between the various products;

The sum of the manufactured products by a business sector is equal to the total production of this sector.

$$XS_j = \sum_i DX_(i,j) \quad (10)$$

The passage of the production activities to finished products is guaranteed through the production cost and the product price of the producer.

$$PX_i * X_i = \sum_j PXS_j * DX_{(i,j)} \quad (11)$$

The model also distinguishes itself by the existence of the transport margins. The price with which the product i enters the market is given by :

$$PXM_I = e = PX_i * (1 + tmc_i) \quad (12)$$

On the other hand, the global demand for the composite product of the market is constituted of the households and the State consumptions, the intermediate consumption and the investment. The demands in terms of the products value for investment purposes are price-sensitive. They are calculated as a fixed proportion μ_i of the total investment $FBCFT$.

$$INVVV_i = \frac{\mu_i * FBCFT}{PC_i} \quad (13)$$

The market price of the composite product i is equal to the price of this composite to which we add the taxes and the subsidies on the products. This price is specified as follows:

$$PC_i = PQ_i * (1 + ((tsq_i * (1 + tx_i) * (1 + tv_i)) + (tv_i * (1 + tx_i) + tx_i))) \quad (14)$$

Concerning the quantity of the consumed product i by the households and which is by nature sensitive to the composite product price PC_i, its specification ensues from a utility maximization program of Cobb-Douglas type under the constraint of the disposable income YDM.

$$CM_i = \frac{gamma_i * YDM}{PC_i} \tag{15}$$

The total of the intermediate demand of the economy in input i is given by :

$$DIT_i = \sum_j \epsilon 2_{(i,j)} * CI_j \tag{16}$$

4.5.3. labour supply

The modelling of the retained labour market has to take into consideration the existence of unemployment in the economy. The equilibrium on the labour market shall thus spell as follows :

$$\sum_j LD_j + UU = LS \tag{17}$$

With LS the total labour supply.

$PIndex$ the consumer price index.

$$PIndexC = \prod_i PC_i^{beta_i} \tag{18}$$

With, $beta_i$ the product part in the household budget. The salaries curve is defined by:

$$Log(WL/PindexC) = alphar + alphau * Log(UU/LS) \tag{19}$$

with, *alphar* a constant of the salaries curve and *alphau* is the elasticity of the salaries curve in the unemployment rate.

4.5.4. income and savings of the households and the companies

The household income includes the labour remuneration; the return on capital (household entrepreneurs), the government transfers and the dividends on the companies' product titles (either from national or international source).

$$YM = wl * (Ls - uu) + \lambda * (\sum_j r_j * KD_j) + DIV + ADIV + TYWM \tag{20}$$

With:

- λ: the capital share which is the product of the households;
- DIV: paid dividends to the households entrepreneurs;
- $ADIV$: autonomous dividends of the households;
- $TYWM$: DEST transfers to the households;
- LS: labour offer/labour supply;
- uu: number of jobless people;

The disposable income of the households is given by:

$$YDM = YM - TDM - TVME \tag{21}$$

With :

TDM: direct taxes receipts on the households' income; $TVME$: transfers paid by the households to the exterior;

The savings of the households are a fixed proportion of the disposable income :

$$EM = psi * YDM \tag{22}$$

The companies income is constituted by the capital return and the transfers received from the other agents :

$$YE = (1 - \lambda - \varrho) * \sum_{J} (r_j * KD_j) + TE + TWE \tag{23}$$

With :

TE: transfers of the households to the companies; ϱ: part of the capital return received by the government; TWE: foreign transfers to the companies;

The savings of the companies are deducted after the subtraction of the transfers paid to the other agents.

$$EEE = YE - TDE - TVEE - TXWEG - DIV \tag{24}$$

with:

TDE: $receiptsofthedirecttaxesonthecompanies'income$;$TVEE$: the transfers paid by the companies to the exterior; TXWEG: $transfermadebythecompaniestothegovernment$;

A part of the disposable income of the households is distributed to the companies in the form of transfers.

$$TE = E = \eta * YDM \tag{25}$$

η, part of the disposable income of the households transferred to the companies.

$$TXWG = E = \zeta * YDM \tag{26}$$

ζ, is part of the disposable income of the households transferred to the government.

$$TVME = E = \phi * YDM \tag{27}$$

φ, is part of the disposable income of the households transferred to the exterior.

Finally, an equation which redraws the equality between the investment in value and its savings is added to the model. The considered savings are those of the households, the companies (financial and non-financial), the State and the five commercial partners through the current balances.

$$\sum_i invvv(i) + \sum_i delst(i)) = EM + EEE + EG + INVBOP \tag{28}$$

The composite product Q_i presents the total market supply. The demand of this offer is constituted of consumptions of the households and the State, the intermediate consumptions of the business sectors and the investment which is represented by the $FBCFT$ and the stock variation. Therefore, the condition markets equilibrium of products and services becomes:

$$QQQ_i = CM_i + INVVV_i + MRCVO_i + delsto_i + DIT_i + ggo_i \tag{29}$$

4.5.5. Revenus et pargnes de l'tat

$$YG = RCG+TDM+TDE+(\sum_i TIM_i+TP_i+TVA_i+subpd_i)+(\sum_j subpdd_j+TPA_j) \tag{30}$$
$$+TXWG + TXWEG + BOPG$$

with:

RCG: the capital income received by the government; TDM: direct taxes revenue on the household income; TDE: direct taxes revenue on the companies' income; TIM: customs duties revenue on the product i; TP: tax on the product i; TVA: VAT on the product i; $SUBPD$: subsidy on the products i; $SUBPDD$: subsidy on the production j; TPA: tax on the production activity j; $TXWG$: transfers of the households to the government; $TXWEG$: transfer realized by the companies to the government;

$$RCG = \varrho * \sum_{j} (r_j * KD_j) \tag{31}$$

with:

- tx_i: the indirect tax rate on the product i;
- QQQ_i: the composite product i;
- PQ_i: the market price of the composite products i;

$$TP(i) = tx(i) * (PQ(i) * QQQ(i)) \tag{32}$$

where, tv_i is the VAT rate on the product i.

$$TVA(I) = tv(i) * (1 + tx(i)) * PQ(i) * QQQ(i) \tag{33}$$

txm_i, customs duties rate on the product i.

$$TIM(i) = txm(i) * IMT(i) \tag{34}$$

txa_j, indirect tax rate on the sector production activity j.

$$TPA(j) = txa(j) * PVA(j) * va(j) \tag{35}$$

tym, the direct tax rate on the income of the households.

$$TDM = tym * YM \tag{36}$$

tye, the direct tax rate on the income of the firms or the companies.

$$TDE = tye * YE \tag{37}$$

tsq_i, subsidy rate on the product i.

$$SUBPD(i) = tsq(i) * (tv(i) + 1) * (1 + tx(i)) * (PQ(i) * QQQ(i)) \tag{38}$$

$tsxs_j$, subsidy rate for the branch j.

$$SUBPDd(j) = tsxs(j) * PVA(j) * VA(j) \tag{39}$$

The state income is distributed among the public savings, the public expenditure and the transfers abroad.

$$YG = EG + G + TVGE \tag{40}$$

4.5.6. The international trade block

The producers choose on which market they are going to sell their production by basing themselves on the prices $PE_{(dest,i)}$ which they can obtain for their production. In order to represent this decision, we have used a constant elasticity of transformation (CET) function. First, the producers decide to sell either on the local market D_i where the price is PD_i, or to export their production EXT_i with a price PEC_i. The problem of profits maximization allows expressing the sales on the local market as a function of the exports' level.

$$D_i = betax_i * X_i * (PQ_i/PD_i)^{taux_i} \tag{41}$$

avec:

- $betax_i$: scale coefficient of the export demand.
- $taux_i$: the elasticity of the product's commercial transformation.

The export supply depends only on the scale coefficient of the export demand $gamma_a(dest, i)$.

$$EX_{(dest,i)} = gamma_{a_{(dest,i)}} * (PWm_{(dest,i)}/Pxm_{(i)})^{sigma_{X_{(i)}}} \tag{42}$$

The trade-off between the domestic and the imported products is realized through a constant substitution elasticity (CES) function, what allows us to express the total import demand as a function of the national demand in composite products.

$$IMT_{(i)} = e = alphaim_{(i)} * QQQ_{(i)} * (PQ_{(i)}/PMC_{(i)})^{sigmaim_{(i)}} \tag{43}$$

The import demand per origin $IM_{(dest,i)}$ where the prices are $PM_{(dest,i)}$ given by[9]:

- *alphad*: the part of repartition of the imported products.
- *sigmad*: lthe elasticity of transformation of the importation product i.

$$IM_{(dest,i)} = E = alphad_{(dest,i)} * IMT_{(i)} * (PMC_{(i)}/PM_{(dest,i)})^{(sigmad_{(i)})} \tag{44}$$

9

- *sigmaim*: elast. of trans. of the import product. I (imp. fct CES)
- *alphaim*: par. of repartition of the imp product. I (imp. fct CES)

4.6. The model dynamism

The dynamics of the model are based on the sequential dynamics, thereby; there will be no inter-temporal optimization behaviour.

Compared with the inter-temporal dynamics which are based on proactive dynamic adjustments, the sequential dynamics are based on the passage from an equilibrium state to another. At the level of this work, our starting point was a static computable general equilibrium model based on comparative statics, and then we have tried to analyze the post-decisional implications of the policy of subsidies decrease on oil products consumption through introducing the sequential dynamics on our static computable general equilibrium model through three essential stages: first, assuring the link between the stationary states; second, characterizing the economy expansion in time; third, defining the investment market.

The link between the static states is realized through capital accumulation. However, the economy expansion is assured by introducing the population growth and the technical progress. For the purpose of simplification, we have retained that the population growth, in addition to the two previously mentioned points, the sequential dynamics require nevertheless the distinction between the supply and demand of the investment products. In our static model, we have clarified the supply of these products according to their original sectors, without worrying about their reallocations in the economy. Although, at the level of the dynamic models the reallocation of the investment products cannot be disregarded, because the sector which receives these products increases its capital stock and even its production potential in the future periods.

5. Closure and simulation

5.1. Closure

The model closure consists in equalizing the number of the variables to the number of equations. Accordingly, the model contains 61 equations and consequently so many variables. The choice of the macroeconomic closures exceeds the simple fact of raising the under-determination of the equations system and consists of the adoption of a transmission scheme of the effects of the simulated shocks and the factors engendering them. In response to the simulated shocks, the closure according to the objective granted to the computable general equilibrium model a big flexibility thanks to the possibility of simulating the effects of the range of measures envisaged by the decision-maker and qualifying them according to the privileged mode of the variables' behaviour.

The Tunisian revolution urges us to think about the policies of economic and social development to be undertaken in order to raise the underdevelopment and improve the living standard, to respond to the claims of the revolution in a context

where the oil prices do not stop increasing the Tunisian energy bill and consequently the subsidy amount weighs increasingly heavily on the state budget. The choice of the closure is related to the present economic environmental vision, and this choice determines the sequences following any shock on an exogenous variable. The closure adopted in the model will have then important implications as for the simulations results. In this context, the closure adopted in the model supposes that all the realized transfers between the companies and the State with the foreign countries is supposed to be exogenous.

Among the main implications of the retained closure, we shall mention the capacity to analyze the energy policy undertaken in the country. The simulations on the oil prices and the subsidies on oil products consumption allow us to assess the transmission effects towards the market mechanisms, through reflecting the impact on the prices and the macroeconomic variables.

The oil price shock entails adjustments which result in new prices structures and in a modification of their levels. The analysis of this impact has to consider the effects of this new prices situation on the economic agents and on the economy in general. It is therefore essential to have a macroeconomic modelling, where all the relations between the markets and the sectoral interactions are taken into consideration and all the endogenous variables and transmission of the impacts between the various markets (products, labour, and finances) are transcribed in the model relations.

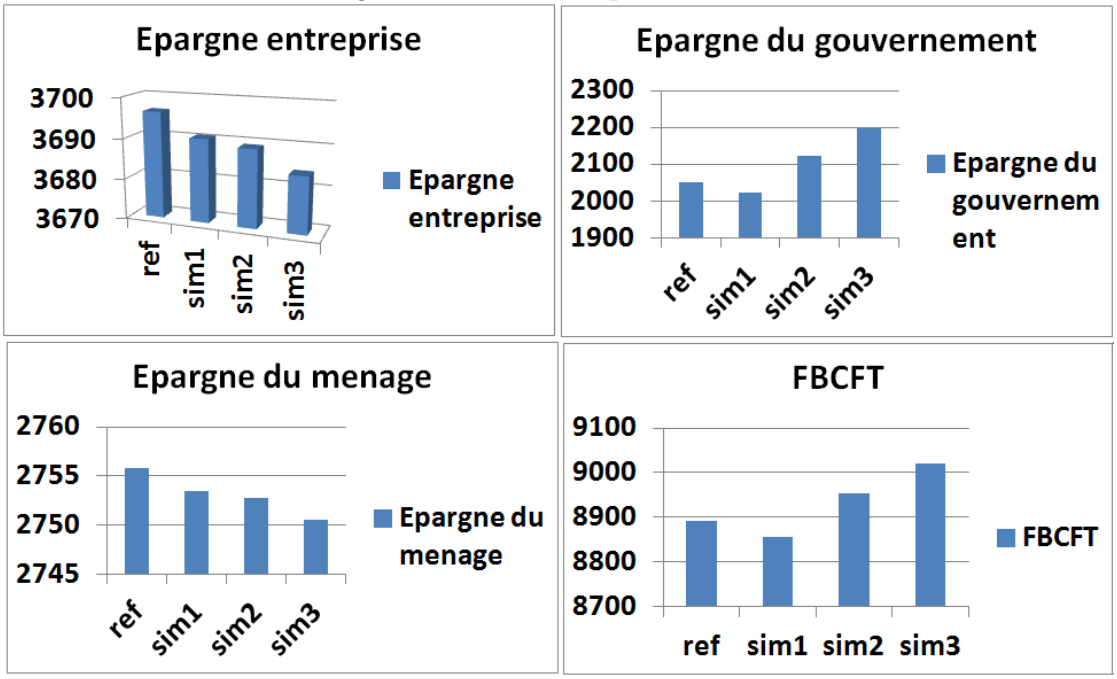
5.2. Simulation of the static model

Starting from the basic static model replicated on the matrix of the year 2005, we have simulated three basic scenarios. The first scenario consists in 12% increase in oil price. The second scenario consists in 0,8% subsidy decrease on oil products consumption. Finally, the third realized scenario is a combination of the two previous simulations.

The purpose of these simulations is to observe the reaction of the Tunisian economy facing oil price increase and subsidy reduction in oil products consumption. In order to facilitate the presentation and the interpretation of the results, we shall only retain the macroeconomic and micro-economic results displayed in appendix C. We are first going to study the simulations' impact on the savings and on the gross fixed capital formation, then the impact on the commercial balance and finally the impact on the growth.

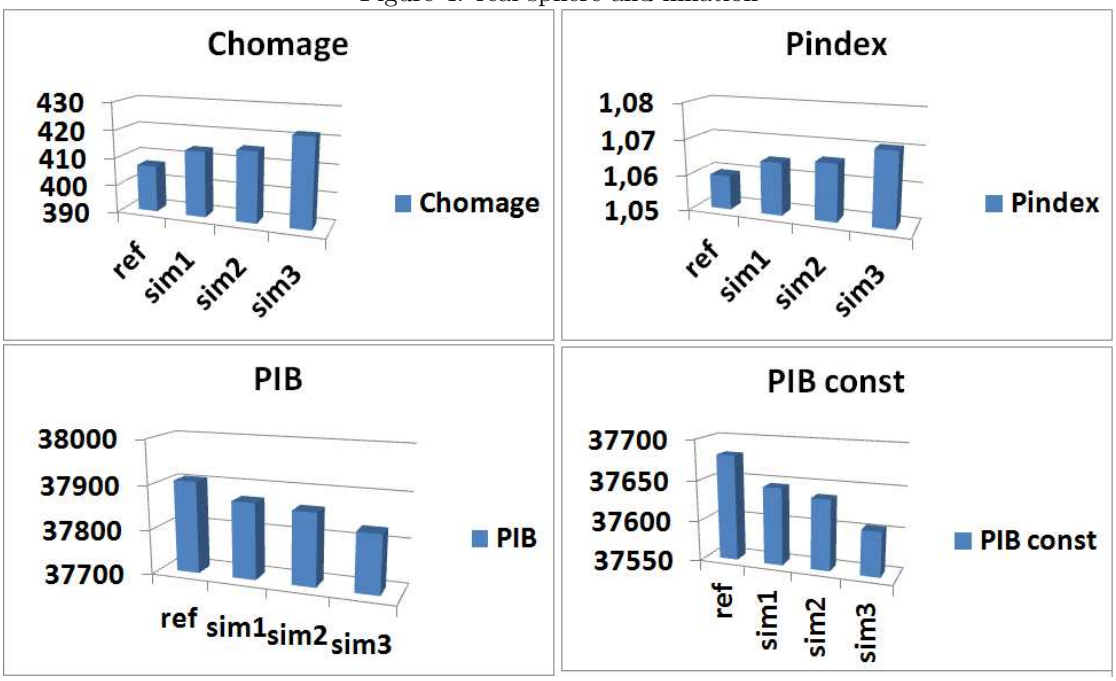
A priori, two major transmission channels come into play further to the proposed scenarios. First, the loss in terms of the consumer and the companies purchasing power entails decrease in demand for final and intermediate consumer products and therefore the global demand per sector [see Table (4; 5; 6 *Annexe*)]. The shocks transmission in this case is mainly realized through the observed increase by the relative prices (after subsidy reduction or the increase in oil products prices), therefore leading to an increase in the production costs [Table (7; 8 *Annexe*]. Second, the proportion to be saved of the households and the companies decreases in response to sales price (subsidy reduction or the increase in oil products prices). Furthermore, the State seems beneficiary of the sales price; similarly we have recorded an increase at the level of the State savings. On that basis, the positive evolution of the State savings exceeds the decrease at the level of the savings of the households and the companies; and henceforth we have recorded a positive evolution at the level of the gross fixed capital formation of the economy (Figure 3).

Figure 3: Gross fixed capital formation



The macroeconomic effects of oil price products increase or the decrease of oil products consumption subsidy or both of them are presented in the Figure 4. At the macroeconomic level, the three scenarios engender a regression at the level of the GDP, an increase at the level of the general price index and an increase at the level of the unemployment figures.

Figure 4: real sphere and inflation



As for the commercial balance (Figure 5), it should be noted that that the three scenarios are more favourable compared with the reference situation and that the scenario number 2 is the most favourable among three supposed scenarios. The profits observed at the level of the commercial balance are mainly due to the increase of crude oil exports (Table 5). Indeed, the increase of oil exports is essentially due to the decrease of the national demand in crude oil which is due in its turn either to the subsidy reduction or to the increase in oil products prices.

The State which implicitly subsidizes crude oil increases its exports in crude oil.

Figure 5: Commercial balance

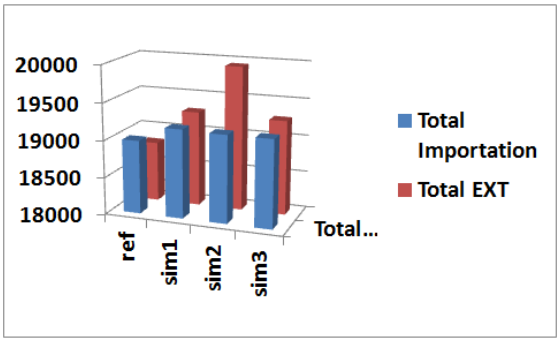


Table 5: Total exports per product

	ref	sim2	sim3	sim1
P-AA+AB	288,962654	287,977554	286,840429	288,113255
P-111	1426,81253	1995,22436	2782,43085	1999,79052
P-CB	87,5286139	85,9144595	84,132867	86,1293672
P-manuf	7031,66455	7016,49842	7000,5789	7017,92681
P-DF	300,912666	322,367628	346,738975	322,383048
P-DG	1236,26047	1232,21326	1227,71704	1232,50686
P-DH	202,646469	202,239841	201,753793	202,285383
P-DK	413,339587	413,342824	413,450036	413,075876
P-DL	2366,33955	2363,41396	2360,44459	2364,02835
P-DM	365,283789	364,645203	363,940007	364,59629
P-HH	2803,4729	2774,49759	2746,43237	2775,10846
P-60	339,362488	326,781615	312,837515	328,535186
P-61	201,852485	198,546061	194,762353	199,040591
P-62	725,268826	670,643237	613,835736	678,437412
P-63	163,244663	160,514605	157,433425	160,934878
P-64	23,579854	23,1560518	22,6763484	23,2303297
P-JJ	144,592798	143,152996	141,620293	143,210937
P-KK	687,785369	683,340511	678,402291	683,421167
P-SVNM	4,80003765	4,75107379	4,69656105	4,75632149
ToTal	18813,7103	19269,2213	19940,7244	19287,511

5.3. Results of the dynamic model

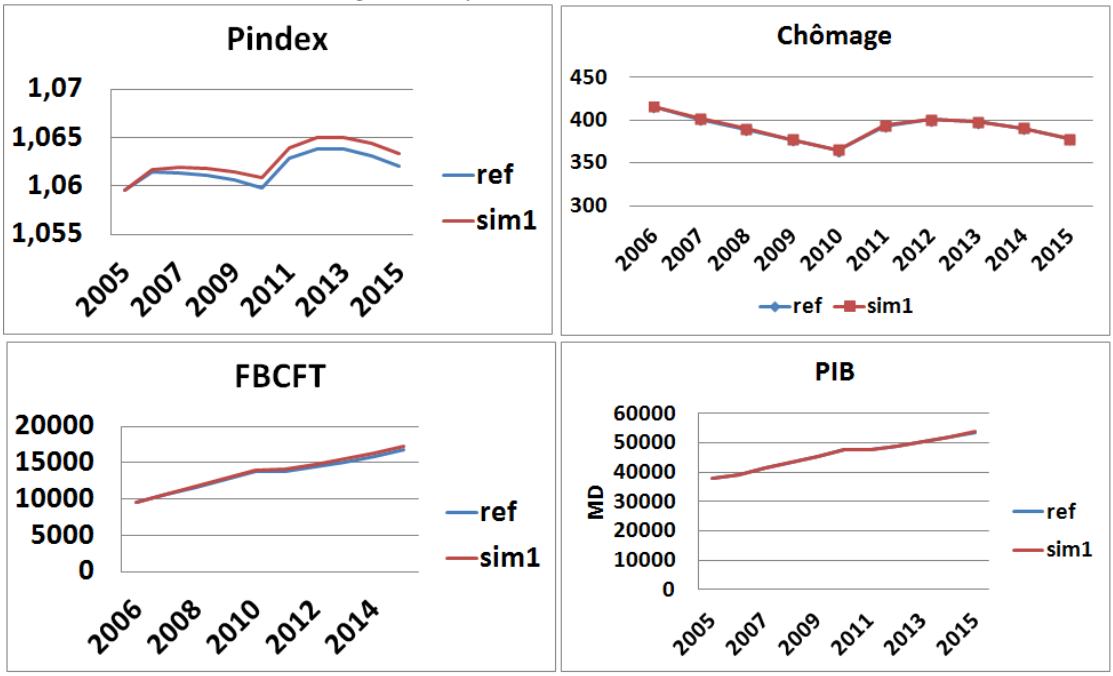
5.3.1. Simulation I: annual Decrease of 10% of the consumer subsidy for oil products

We are going to present a dynamic version of the static model so to make the connection between the short-term and the long-term model. The interest of the dynamic construction is to see the impact of the saving acquired at the level of the gross fixed capital formation and to verify whether the dynamic construction confirms the results already obtained on the actual plan.

At the level of this simulation, we shall study the impact of the progressive dismantling of consumer subsidy for oil products by decreasing the subsidy rate by 10% every year for the period going from 2005 until 2015.

The results have shown that there are no remarkable differences between the values of the variables stemming from the simulation and the variables replicated on the basic model. We can therefore confirm this conclusion through the Figure **??** which shows that the two graphs of unemployment and the GDP do merge.

Figure 6: Dynamic model: simulation 1



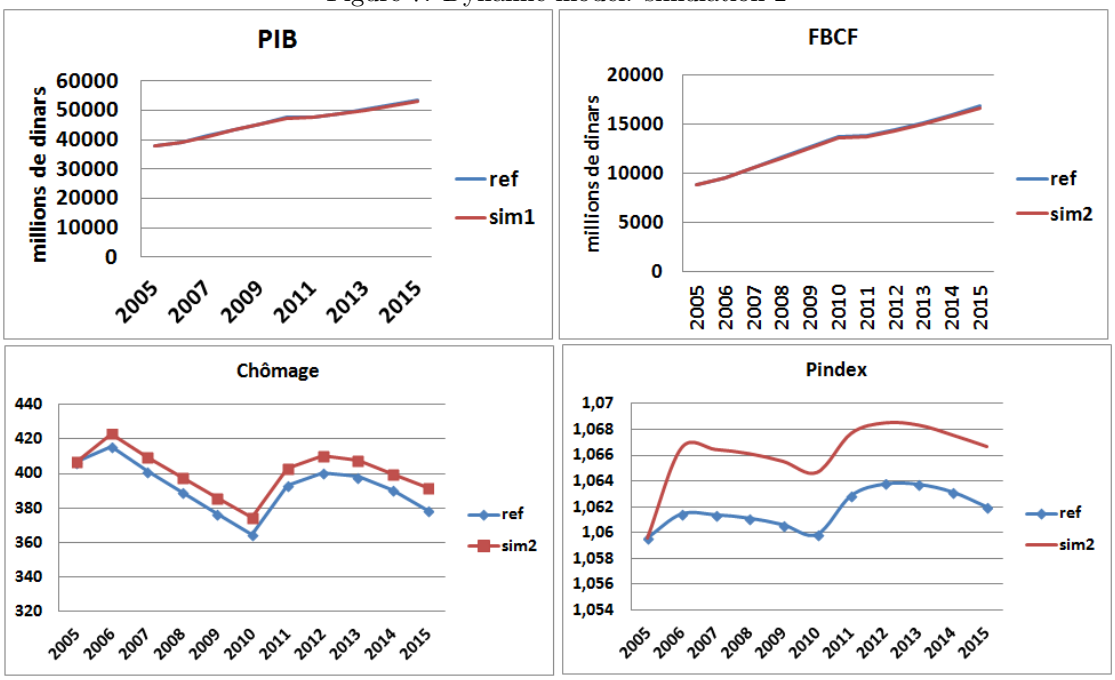
5.3.2. Simulation II: Oil price shocks

The second simulation consists in introducing the effect of price shocks of the oil products. The supposed shock consists in increasing 12% of the oil price for the years $2006 - - > 2015$.

We notice that the oil price shocks have delayed the growth and have, consequently, caused a light increase at the level of the number of the unemployed (Figure 6).

However, we observe a light improvement at the deficit level of the commercial equilibrium which goes from -3892.02855 to -3636.2495, which corresponds to a $6,571\%$ decrease compared with the reference situation of 2010 (more details in appendix C).

Figure 7: Dynamic model: simulation 2

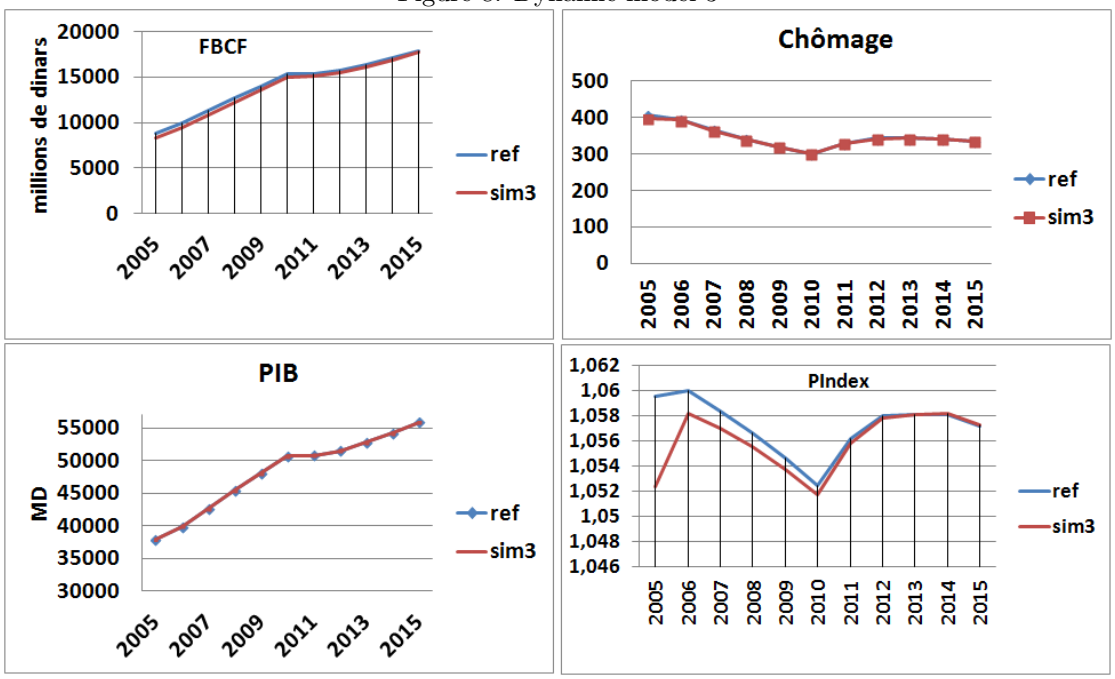


5.3.3. Simulation III: Combination of simulation I and II and public expenditure increase

This simulation allows using the profits of the savings obtained from the two previous simulations. We shall thus suppose a 7% increase at the level of the Government expenditure every year (Figure 7).

The results show a clear improvement at the level of the GDP and of the unemployment compared with the figure calculated during the simulations I and II and even a very light improvement compared with the reference situation for the period 2005-2011.

Figure 8: Dynamic model 3



6. Conclusion

In this research we have tried to present a Static Computable General Equilibrium Model, which innovatively integrates, the producers prices, the ex-factory prices, the composite products prices and finally the final consumer prices. The use of this model allows a better understanding of the impact of oil price variation and contributes on the other hand to deepen our knowledge concerning the utility of the elimination of the subsidies granted to oil products consumption.

The results of the simulations of the static model show that the increase in oil products prices increases the amount of the subsidies supported by the State, what delays the investment. As for the subsidy reduction, it affects the consumers' income and the national demand in the products of intermediate consumption; but the combination of the two simulations shows a positive evolution at the level of the gross fixed capital formation of the economy.

Given its results, the static model has been spread to a dynamic model. The interest of the dynamic construction is to see the impact of the savings acquired at the level of the gross fixed capital formation and to verify whether the dynamic construction confirms the already obtained profits on the real plan.

The dynamic model had for objective to study the impact of the progressive dismantling of the consumer subsidy of oil products by decreasing the subsidy rate with 10% every year and this for the period spreading from 2005 until 2015,

and similarly by taking into consideration the effects of oil prices shock and this through introducing an increase by 12% in the oil price.

The results show that there is no remarkable difference between the values of the variables stemming from the two simulations and variables replicated on the basic model. These results urged us to define a third simulation which appears as a combination of the two last simulations and which looks for a possible use of the savings profits obtained from the progressive decrease of 10% of the subsidy. We are thereby going to suppose an increase at the level of Government expenditure by 7% every year.

The results show a clear improvement at the level of the GDP and the unemployment compared with the figure calculated during the simulations I and II and even a very light improvement compared with the reference situation.

In conclusion, the subsidies' progressive decrease, by getting closer to the true prices, allows the State to direct its useless expenditure to a more profitable use for the company by transferring this saved amount to a public investment.

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Table 1: Nomenclature des comptes de produits

Nomenclature des comptes de produits	
P-AA+AB	Agriculture & pche
P-111	Ptrole brut gaz naturel
P-CB	Extraction de produits non energetiques
P-manuf	produits manufacturs
P-DF	Cokefaction, raffinage, industries nuclaires
P-DG	produits chimiques
P-DH	Industrie du caoutchouc et des plastiques
P-DK	Fabrication de machines et quipements
P-DL	Fabrication d'quipements lctriques et lctroniques
P-DM	Fabrication de matriel de transport
P-40	Les produits d'lctricit, de gaz et de chaleur
P-FF	Construction

Table 2: Nomenclature des comptes de produits

P-GG	Commerce; rparations automobile et d'articles domest
P-HH	Htels et restaurants
P-60	Transports terrestre
P-61	Transports maritimes et cotiers
P-62	Transport ariens
P-63	services auxiliaires des transports
P-64	postes & tlcommunication
P-JJ	Activits financires
P-KK	Immobilier, locations et services aux entreprises
P-SVNM	services non marchands

Table 3: Nomenclature des comptes des activits de productions

Nomenclature des comptes des activits de productions	
AA+AB	Agriculture & pche
CA	Extraction de produits energetiques
CB	Extraction de produits non energetiques
A-MANF	Industries manufacturires
DF	Cokefaction, raffinage, industries nuclaires
DG	Iindustrie chimique
DH	Industrie du caoutchouc et des plastiques
DK	Fabrication de machines et quipements
DL	Fabrication d'quipements lctriques et lctroniques
DM	Fabrication de matriel de transport
EE	Production et distribution d'lctricit et de gaz
FF	Construction
GG	Commerce; rparations automobile et d'articles domestiques

Nomenclature des comptes des activits de productions	
HH	Htels et restaurants
60	Transports terrestre
61	Transports maritimes et cotiers
62	Transport ariens
63	services auxiliaires des transports
64	postes & tlcommunication
JJ	Activits financires
A-SVNM	services non marchands
A-SVNM	services non marchands

Table 4: Consommation des mnages

Consommation des mnages

dim1	dim2	dim3	level
P-AA+AB	dif1	dif1	2158,800487
P-AA+AB	dif1	dif2	2142,28287
P-AA+AB	dif2	dif1	2144,196672
P-AA+AB	dif2	dif2	2122,433089
P-111	dif1	dif1	102,4976668
P-111	dif1	dif2	77,60315733
P-111	dif2	dif1	77,61754255
P-111	dif2	dif2	61,69582688
P-CB	dif1	dif1	20,04764204
P-CB	dif1	dif2	19,74338902
P-CB	dif2	dif1	19,78567255
P-CB	dif2	dif2	19,41634431
P-manuf	dif1	dif1	8113,023986
P-manuf	dif1	dif2	8189,912942
P-manuf	dif2	dif1	8187,720195
P-manuf	dif2	dif2	8299,330515
P-DF	dif1	dif1	796,6515848
P-DF	dif1	dif2	621,7526396
P-DF	dif2	dif1	641,9682546
P-DF	dif2	dif2	493,3597191
P-DG	dif1	dif1	1082,827041
P-DG	dif1	dif2	1088,494555
P-DG	dif2	dif1	1088,075939
P-DG	dif2	dif2	1095,466976

Consommation des mnages

dim1	dim2	dim3	level
P-DH	dif1	dif1	602,2806433
P-DH	dif1	dif2	602,492374
P-DH	dif2	dif1	602,0710142
P-DH	dif2	dif2	601,3080746
P-DK	dif1	dif1	232,343219
P-DK	dif1	dif2	233,8550321
P-DK	dif2	dif1	231,0433044
P-DK	dif2	dif2	235,6391397
P-DL	dif1	dif1	562,0790669
P-DL	dif1	dif2	561,2014538
P-DL	dif2	dif1	562,4647363
P-DL	dif2	dif2	560,4565224

Lgende

dif1	dif1	ref
dif1	dif2	sim2
dif2	dif1	sim1
dif2	dif2	sim3

Consommation des mnages

dim1	dim2	dim3	level
P-DM	dif1	dif1	1372,531897
P-DM	dif1	dif2	1379,661504
P-DM	dif2	dif1	1389,491738
P-DM	dif2	dif2	1387,269657
P-40	dif1	dif1	442,1239642
P-40	dif1	dif2	419,07126
P-40	dif2	dif1	419,5890211
P-40	dif2	dif2	398,4612279
P-FF	dif1	dif1	29,40954767
P-FF	dif1	dif2	29,39677724
P-FF	dif2	dif1	29,23026525
P-FF	dif2	dif2	29,37333787
P-GG	dif1	dif1	290,1558943
P-GG	dif1	dif2	289,5628352
P-GG	dif2	dif1	289,6526547
P-GG	dif2	dif2	288,9716607
P-HH	dif1	dif1	1358,33804
P-HH	dif1	dif2	1354,461664
P-HH	dif2	dif1	1354,873073
P-HH	dif2	dif2	1351,132119
P-60	dif1	dif1	852,1130387
P-60	dif1	dif2	846,873918
P-60	dif2	dif1	847,6714068
P-60	dif2	dif2	841,2938264

Consommation des mnages

dim1	dim2	dim3	level
P-61	dif1	dif1	6,126317918
P-61	dif1	dif2	6,111554884
P-61	dif2	dif1	6,114101719
P-61	dif2	dif2	6,097344825
P-62	dif1	dif1	39,40992709
P-62	dif1	dif2	39,04089095
P-62	dif2	dif1	39,09768631
P-62	dif2	dif2	38,6477109
P-63	dif1	dif1	129,6606301
P-63	dif1	dif2	129,2837348
P-63	dif2	dif1	129,348882
P-63	dif2	dif2	128,9141289
P-64	dif1	dif1	726,2524852
P-64	dif1	dif2	723,5387181
P-64	dif2	dif1	724,040419
P-64	dif2	dif2	720,8735168
P-JJ	dif1	dif1	561,1010233
P-JJ	dif1	dif2	559,6527406
P-JJ	dif2	dif1	559,8336222
P-JJ	dif2	dif2	558,3660694
P-KK	dif1	dif1	3479,20844
P-KK	dif1	dif2	3471,499331
P-KK	dif2	dif1	3471,983609
P-KK	dif2	dif2	3464.870388

Consommation des mnages

dim1	dim2	dim3	level
P-SVNM	dif1	dif1	1505,519947
P-SVNM	dif1	dif2	1503,096846
P-SVNM	dif2	dif1	1503,154894
P-SVNM	dif2	dif2	1499,495156

Table 5: Consommation intermediaire

Consommation intermediaire

dim1	dim2	dim3	level
AA+AB	dif1	dif1	1433,83
AA+AB	dif1	dif2	1431,668
AA+AB	dif2	dif1	1432,096
AA+AB	dif2	dif2	1430,09
CA	dif1	dif1	420,9989
CA	dif1	dif2	420,9849
CA	dif2	dif1	420,9877
CA	dif2	dif2	420,9746
CB	dif1	dif1	285,0298
CB	dif1	dif2	284,9029
CB	dif2	dif1	284,928
CB	dif2	dif2	284,8102
A-MANF	dif1	dif1	11772,97
A-MANF	dif1	dif2	11760,36
A-MANF	dif2	dif1	11762,86
A-MANF	dif2	dif2	11751,15
DF	dif1	dif1	978,3216
DF	dif1	dif2	978,2803
DF	dif2	dif1	978,2885
DF	dif2	dif2	978,2502
DG	dif1	dif1	2350,368
DG	dif1	dif2	2349,59
DG	dif2	dif1	2349,744
DG	dif2	dif2	2349,021
DH	dif1	dif1	341,0409
DH	dif1	dif2	339,7785

Consommation intermediaire

dim1	dim2	dim3	level
DH	dif2	dif1	340,0285
DH	dif2	dif2	338,8588
DK	dif1	dif1	966,4541
DK	dif1	dif2	965,44
DK	dif2	dif1	965,641
DK	dif2	dif2	964,6995
DL	dif1	dif1	1743,906
DL	dif1	dif2	1742,679
DL	dif2	dif1	1742,922
DL	dif2	dif2	1741,782
DM	dif1	dif1	551,8758
DM	dif1	dif2	551,713
DM	dif2	dif1	551,7453
DM	dif2	dif2	551,594
EE	dif1	dif1	685,1018
EE	dif1	dif2	684,8393
EE	dif2	dif1	684,8913
EE	dif2	dif2	684,6474
FF	dif1	dif1	3867,657
FF	dif1	dif2	3859,944
FF	dif2	dif1	3861,472
FF	dif2	dif2	3854,316
GG	dif1	dif1	1650,738
GG	dif1	dif2	1649,046
GG	dif2	dif1	1649,382
GG	dif2	dif2	1647,81

Consommation intermediaire

dim1	dim2	dim3	level
HH	dif1	dif1	1513,759
HH	dif1	dif2	1512,977
HH	dif2	dif1	1513,132
HH	dif2	dif2	1512,406
60	dif1	dif1	768,8583
60	dif1	dif2	768,3463
60	dif2	dif1	768,4478
60	dif2	dif2	767,9722
61	dif1	dif1	261,1307
61	dif1	dif2	261,0919
61	dif2	dif1	261,0996
61	dif2	dif2	261,0635
62	dif1	dif1	591,3677
62	dif1	dif2	591,2866
62	dif2	dif1	591,3027
62	dif2	dif2	591,2274
63	dif1	dif1	308,1491
63	dif1	dif2	308,0688
63	dif2	dif1	308,0847
63	dif2	dif2	308,0102
64	dif1	dif1	653,3673
64	dif1	dif2	653,2447
64	dif2	dif1	653,269
64	dif2	dif2	653,1551

Consommation intermediaire

dim1	dim2	dim3	level
JJ	dif1	dif1	346,9077
JJ	dif1	dif2	346,826
JJ	dif2	dif1	346,8422
JJ	dif2	dif2	346,7663
KK	dif1	dif1	1528,453
KK	dif1	dif2	1528,191
KK	dif2	dif1	1528,243
KK	dif2	dif2	1528
A-SVNM	dif1	dif1	1999,215
A-SVNM	dif1	dif2	1993,887
A-SVNM	dif2	dif1	1994,942
A-SVNM	dif2	dif2	1990,002

Table 6: Demande globale par secteur

Demande globale par secteur

dim1	dim2	dim3	level
P-AA+AB	dif1	dif1	3742,04603
P-AA+AB	dif1	dif2	3762,536504
P-AA+AB	dif2	dif1	3760,83297
P-AA+AB	dif2	dif2	3791,57003
P-111	dif1	dif1	1037,683694
P-111	dif1	dif2	1368,579363
P-111	dif2	dif1	1368,718975
P-111	dif2	dif2	1719,624692
P-CB	dif1	dif1	771,1322124
P-CB	dif1	dif2	781,5684882
P-CB	dif2	dif1	780,1842513
P-CB	dif2	dif2	793,6597865
P-manuf	dif1	dif1	10816,60786
P-manuf	dif1	dif2	10690,4949
P-manuf	dif2	dif1	10698,22425
P-manuf	dif2	dif2	10531,87682
P-DF	dif1	dif1	1878,558838
P-DF	dif1	dif2	2401,5767
P-DF	dif2	dif1	2326,990623
P-DF	dif2	dif2	3021,587191
P-DG	dif1	dif1	2850,299001
P-DG	dif1	dif2	2829,63114
P-DG	dif2	dif1	2831,874238
P-DG	dif2	dif2	2807,399735

Demande globale par secteur

dim1	dim2	dim3	level
P-DH	dif1	dif1	528,3734069
P-DH	dif1	dif2	527,0307891
P-DH	dif2	dif1	527,6289328
P-DH	dif2	dif2	527,2234881
P-DK	dif1	dif1	1772,331292
P-DK	dif1	dif2	1756,864724
P-DK	dif2	dif1	1779,048863
P-DK	dif2	dif2	1740,661974
P-DL	dif1	dif1	1724,66695
P-DL	dif1	dif2	1724,049417
P-DL	dif2	dif1	1720,832302
P-DL	dif2	dif2	1723,920285
P-DM	dif1	dif1	551,0005588
P-DM	dif1	dif2	547,0941819
P-DM	dif2	dif1	543,4319354
P-DM	dif2	dif2	543,3256205
P-40	dif1	dif1	763,2521187
P-40	dif1	dif2	803,5607341
P-40	dif2	dif1	802,90092
P-40	dif2	dif2	843,8379546
P-FF	dif1	dif1	129,7638851
P-FF	dif1	dif2	129,4959541
P-FF	dif2	dif1	130,298222
P-FF	dif2	dif2	129,3626988

Demande globale par secteur

dim1	dim2	dim3	level
P-GG	dif1	dif1	779,0890756
P-GG	dif1	dif2	779,620789
P-GG	dif2	dif1	779,5897391
P-GG	dif2	dif2	780,4379283
P-HH	dif1	dif1	118,5799542
P-HH	dif1	dif2	118,6234784
P-HH	dif2	dif1	118,6460194
P-HH	dif2	dif2	118,6996565
P-60	dif1	dif1	946,9795311
P-60	dif1	dif2	950,7343529
P-60	dif2	dif1	950,256121
P-60	dif2	dif2	955,4963945
P-61	dif1	dif1	154,1235911
P-61	dif1	dif2	154,1672081
P-61	dif2	dif1	154,1680669
P-61	dif2	dif2	154,2862153
P-62	dif1	dif1	343,6439385
P-62	dif1	dif2	346,1930701
P-62	dif2	dif1	345,8284509
P-62	dif2	dif2	349,1999957
P-63	dif1	dif1	1210,739867
P-63	dif1	dif2	1212,393179
P-63	dif2	dif1	1212,15406
P-63	dif2	dif2	1214,496437

Demande globale par secteur

dim1	dim2	dim3	level
P-64	dif1	dif1	838,3129803
P-64	dif1	dif2	839,6482269
P-64	dif2	dif1	839,4244344
P-64	dif2	dif2	841,4287376
P-JJ	dif1	dif1	1012,430019
P-JJ	dif1	dif2	1012,99207
P-JJ	dif2	dif1	1013,072231
P-JJ	dif2	dif2	1013,822252
P-KK	dif1	dif1	2954,89334
P-KK	dif1	dif2	2954,527107
P-KK	dif2	dif1	2955,486793
P-KK	dif2	dif2	2955,119482
P-SVNM	dif1	dif1	86,58822574
P-SVNM	dif1	dif2	86,48715365
P-SVNM	dif2	dif1	86,53146186
P-SVNM	dif2	dif2	86,51909334

Table 7: Prix de la production sectorielle

Prix de la production sectorielle

dim1	dim2	dim3	level
AA+AB	dif1	dif1	0,999970608
AA+AB	dif1	dif2	1,006843775
AA+AB	dif2	dif1	1,005890943
AA+AB	dif2	dif2	1,01486947
CA	dif1	dif1	0,999910889
CA	dif1	dif2	1,018346316
CA	dif2	dif1	1,017283056
CA	dif2	dif2	1,038774083
CB	dif1	dif1	1,00003572
CB	dif1	dif2	1,038437589
CB	dif2	dif1	1,03319463
CB	dif2	dif2	1,083434148
A-MANF	dif1	dif1	0,999893601
A-MANF	dif1	dif2	1,004168189
A-MANF	dif2	dif1	1,00377338
A-MANF	dif2	dif2	1,0086698
DF	dif1	dif1	1,000104253
DF	dif1	dif2	1,111711571
DF	dif2	dif1	1,111652487
DF	dif2	dif2	1,230283869
DG	dif1	dif1	0,999843166
DG	dif1	dif2	1,006419078
DG	dif2	dif1	1,005954395
DG	dif2	dif2	1,013791897

Prix de la production sectorielle

dim1	dim2	dim3	level
DH	dif1	dif1	0,999805899
DH	dif1	dif2	1,00380659
DH	dif2	dif1	1,003353631
DH	dif2	dif2	1,008637139
DK	dif1	dif1	0,998507821
DK	dif1	dif2	0,999717223
DL	dif2	dif1	1,000422559
DL	dif2	dif2	1,002766839
DL	dif1	dif1	1,002241534
DL	dif1	dif2	1,005129522
DM	dif2	dif1	0,999115243
DM	dif2	dif2	1,002673162
DM	dif1	dif1	1,002963373
DM	dif1	dif2	1,0066359
EE	dif2	dif1	1,000329376
EE	dif2	dif2	1,126810089
EE	dif1	dif1	1,124490509
EE	dif1	dif2	1,26280818
FF	dif2	dif1	0,99928232
FF	dif2	dif2	1,014050225
FF	dif1	dif1	1,012552488
FF	dif1	dif2	1,031226601
GG	dif2	dif1	1,000221314
GG	dif2	dif2	1,004235016
GG	dif1	dif1	1,003531152
GG	dif1	dif2	1,008849835
HH	dif2	dif1	1,000066006
HH	dif2	dif2	1,005275955
HH	dif1	dif1	1,005299779
HH	dif1	dif2	1,010228273

Prix de la production sectorielle

dim1	dim2	dim3	level
60	dif2	dif1	1,000067746
60	dif2	dif2	1,022401258
60	dif1	dif1	1,019177862
60	dif1	dif2	1,048838713
61	dif2	dif1	1,000114765
61	dif2	dif2	1,009599601
61	dif1	dif1	1,00816521
61	dif1	dif2	1,020762849
62	dif2	dif1	1,000363303
62	dif2	dif2	1,046141876
62	dif1	dif1	1,03925715
62	dif1	dif2	1,100413595
63	dif2	dif1	1,000136887
63	dif2	dif2	1,004717315
63	dif1	dif1	1,003954086
63	dif1	dif2	1,010121396
64	dif2	dif1	1,000491029
64	dif2	dif2	1,010983695
64	dif1	dif1	1,009122862
64	dif1	dif2	1,023231831
JJ	dif2	dif1	0,999992652
JJ	dif2	dif2	1,005403757
JJ	dif1	dif1	1,005281926
JJ	dif1	dif2	1,011200145
KK	dif2	dif1	0,999605395
KK	dif2	dif2	1,002511419
KK	dif1	dif1	1,002564767
KK	dif1	dif2	1,005782677
A-SVNM	dif2	dif1	0,999995321
A-SVNM	dif2	dif2	1,00586843
A-SVNM	dif1	dif1	1,005232022
A-SVNM	dif1	dif2	1,012523916

Table 8: Prix des produits depart usine

Prix des produits depart usine

dim1	dim2	dim3	level
P-AA+AB	dif1	dif1	0,9999706
P-AA+AB	dif1	dif2	1,0068236
P-AA+AB	dif2	dif1	1,0058754
P-AA+AB	dif2	dif2	1,0148221
P-111	dif1	dif1	0,9999291
P-111	dif1	dif2	1,0228343
P-111	dif2	dif1	1,0217215
P-111	dif2	dif2	1,0476328
P-CB	dif1	dif1	1,0000294
P-CB	dif1	dif2	1,0379593
P-CB	dif2	dif1	1,032786
P-CB	dif2	dif2	1,0823843
P-manuf	dif1	dif1	0,9999004
P-manuf	dif1	dif2	1,0042276
P-manuf	dif2	dif1	1,0038188
P-manuf	dif2	dif2	1,0088001
P-DF	dif1	dif1	1,0001043
P-DF	dif1	dif2	1,1117116
P-DF	dif2	dif1	1,1116525
P-DF	dif2	dif2	1,2302839
P-DG	dif1	dif1	0,9998473
P-DG	dif1	dif2	1,0064261
P-DG	dif2	dif1	1,0059467
P-DG	dif2	dif2	1,0138112
P-DH	dif1	dif1	0,9998079
P-DH	dif1	dif2	1,0038324
P-DH	dif2	dif1	1,0033804
P-DH	dif2	dif2	1,0086749
P-DK	dif1	dif1	0,9985587
P-DK	dif1	dif2	0,9998341

Prix des produits depart usine

dim1	dim2	dim3	level
P-DL	dif2	dif1	1,0003904
P-DL	dif2	dif2	1,0028686
P-DL	dif1	dif1	1,0023474
P-DL	dif1	dif2	1,0053934
P-DM	dif2	dif1	0,9991543
P-DM	dif2	dif2	1,0026569
P-DM	dif1	dif1	1,002926
P-DM	dif1	dif2	1,0065463
P-40	dif2	dif1	1,0003123
P-40	dif2	dif2	1,1222941
P-40	dif1	dif1	1,1200426
P-40	dif1	dif2	1,2529999
P-FF	dif2	dif1	0,9993022
P-FF	dif2	dif2	1,0145706
P-FF	dif1	dif1	1,0130796
P-FF	dif1	dif2	1,032199
P-GG	dif2	dif1	1,0001704
P-GG	dif2	dif2	1,0055562
P-GG	dif1	dif1	1,0048452
P-GG	dif1	dif2	1,0115607
P-HH	dif2	dif1	1,0000687
P-HH	dif2	dif2	1,0060235
P-HH	dif1	dif1	1,005897
P-HH	dif1	dif2	1,0118852

Prix des produits depart usine

dim1	dim2	dim3	level
P-60	dif2	dif1	1,0000632
P-60	dif2	dif2	1,0218859
P-60	dif1	dif1	1,0187656
P-60	dif1	dif2	1,0476702
P-61	dif2	dif1	1,0001147
P-61	dif2	dif2	1,0095982
P-61	dif1	dif1	1,008164
P-61	dif1	dif2	1,0207598
P-62	dif2	dif1	1,0003633
P-62	dif2	dif2	1,0461419
P-62	dif1	dif1	1,0392572
P-62	dif1	dif2	1,1004136
P-63	dif2	dif1	1,0001622
P-63	dif2	dif2	1,0098476
P-63	dif1	dif1	1,0083398
P-63	dif1	dif2	1,0210944
P-64	dif2	dif1	1,0004881
P-64	dif2	dif2	1,0109108
P-64	dif1	dif1	1,0090625
P-64	dif1	dif2	1,0230761
P-JJ	dif2	dif1	1,0000245
P-JJ	dif2	dif2	1,0057596
P-JJ	dif1	dif1	1,0055271
P-JJ	dif1	dif2	1,0119653
P-KK	dif2	dif1	0,9996457
P-KK	dif2	dif2	1,0033562
P-KK	dif1	dif1	1,0032885
P-KK	dif1	dif2	1,0075232
P-SVNM	dif2	dif1	0,9999955
P-SVNM	dif2	dif2	1,0058716
P-SVNM	dif1	dif1	1,0052373
P-SVNM	dif1	dif2	1,0125266

Table 6: Balance commerciale

		Importations			Exportations	
		ref	sim2		ref	sim2
P-AA+AB	2010	872,640429	895,950344	P-AA+AB	289,540528	288,692817
P-111	2010	829,968038	1141,92319	P-111	1422,15353	1992,13148
P-CB	2010	319,033375	322,563503	P-CB	87,379284	85,9711091
P-manuf	2010	7218,74591	6965,00779	P-manuf	7083,11544	7070,49032
P-DF	2010	1211,38748	1433,6267	P-DF	289,110829	310,578913
P-DG	2010	1804,97132	1764,83114	P-DG	1252,39395	1248,66398
P-DH	2010	618,774519	619,877459	P-DH	204,705585	204,342115
P-DK	2010	2057,10832	2053,0011	P-DK	422,509966	422,322291
P-DL	2010	3103,11033	3081,17034	P-DL	2368,02764	2365,79734
P-DM	2010	1813,3925	1796,94007	P-DM	373,68223	372,885649
P-HH	2010	541,285025	539,055201	P-HH	2839,04358	2812,13218
P-61	2010	716,586794	715,848128	P-60	339,632963	328,583224
P-62	2010	325,918824	325,395219	P-61	200,491435	197,686786
P-63	2010	508,141451	506,049233	P-62	724,20039	676,524642
P-64	2010	44,8549474	44,6786983	P-63	162,706342	160,348793
P-JJ	2010	261,732514	260,729195	P-64	23,1412763	22,7996935
P-KK	2010	559,652144	557,289742	P-JJ	143,347541	142,001476
P-SVNM	2010	6,46745285	6,45770011	P-KK	691,772856	687,447776
	Total	22813,7714	23030,3948	P-SVNM	4,78745666	4,74471871
					18921,7428	19394,1453
		3892,02856	3636,24945			
			-6,57187129			

Table 7: Offre nationale en bien i

Offre globale en bien i

		ref	sim1	sim2	sim3
P-AA+AB	2010	7793,81407	7799,65516	7742,69348	8302,45945
P-111	2010	1585,5907	1588,04617	1507,56874	1644,15639
P-CB	2010	966,600631	967,111523	962,006912	1043,26024
P-manuf	2010	22419,657	22418,9176	22452,0876	24055,4382
P-DF	2010	3347,86547	3349,26881	3168,46512	3400,41647
P-DG	2010	4932,71407	4935,06972	4921,33518	5343,41649
P-DH	2010	1563,7407	1567,10923	1549,56393	1817,96535
P-DK	2010	5293,35095	5413,41956	5234,42519	5834,83647
P-DL	2010	3904,34845	3919,51466	3884,0717	4205,97341
P-DM	2010	2639,26552	2623,60427	2643,31619	2964,24664
P-40	2010	1375,40856	1375,71722	1343,86939	1430,51748
P-FF	2010	10301,6698	10576,1195	10132,3794	11503,0683
P-GG	2010	5376,37335	5376,22779	5371,91633	5379,88378
P-HH	2010	1754,72886	1754,99961	1746,57353	1836,61
P-60	2010	2725,23445	2725,84672	2710,56335	2843,50266
P-61	2010	852,001688	851,951199	851,141412	851,19742
P-62	2010	648,323126	648,490471	644,845931	678,64674
P-63	2010	1719,82594	1720,8365	1711,31915	1862,91509
P-64	2010	1922,66451	1923,12434	1913,49152	2034,16136
P-JJ	2010	2034,99611	2035,65928	2026,41023	2152,35445
P-KK	2010	8170,06207	8179,82715	8133,47731	8617,47274
P-SVNM	2010	7120,48803	7123,78361	7107,56172	8117,5187

Table 8: Dyn sim3 2010 : production et demande intermdiaires en biens i

		X		DIT	
		ref	sim3	ref	sim3
P-AA+AB	2010	6540,89051	6560,18271	4933,04103	4964,03815
P-111	2010	2967,7997	3001,19983	1434,25717	1917,82285
P-CB	2010	754,31765	766,783813	1069,89319	1083,21524
P-manuf	2010	21485,9188	21516,6331	14098,5459	13880,2164
P-DF	2010	1719,21711	1810,88844	2451,89973	3072,18686
P-DG	2010	4127,01755	4134,79396	3565,82641	3522,18841
P-DH	2010	567,612863	568,375491	490,316928	492,006991
P-DK	2010	1703,58295	1705,34347	1704,02688	1757,57105
P-DL	2010	3263,56871	3264,93604	2443,16896	2431,79622
P-DM	2010	1093,88797	1095,97517	740,559671	719,559296
P-40	2010	1563,15994	1657,48268	1083,78274	1141,32586
P-FF	2010	7173,78989	7227,37311	142,934009	145,395061
P-GG	2010	7427,74045	7444,22618	1242,53541	1243,98589
P-HH	2010	5280,91965	5293,83	161,871436	162,080124
P-60	2010	3688,2816	3723,50712	1329,69893	1335,50621
P-61	2010	520,338042	522,421386	225,812606	226,095283
P-62	2010	1440,35921	1468,43133	491,023864	494,440291
P-63	2010	1574,68089	1581,11349	1709,48919	1712,01332
P-64	2010	2225,06775	2233,74332	1170,97749	1173,01057
P-JJ	2010	2291,01321	2297,18562	1427,49569	1429,16013
P-KK	2010	9685,24183	9705,33301	4057,36202	4063,21253
P-SVNM	2010	10485,0664	10512,5401	128,948984	122,894385

Table 9: Dyn sim3 2010 : production et valeur ajout de la branche J

		XS		VA	
		ref	sim3	ref	sim3
AA+AB	2010	8683,27215	8684,4375	6775,95945	6776,86883
CA	2010	2305,98379	2306,04095	1678,34321	1678,38481
CB	2010	733,505656	733,546243	330,957463	330,975776
A-MANF	2010	22511,2817	22513,5735	6636,46733	6637,14297
DF	2010	1589,33402	1589,37445	179,913544	179,918121
DG	2010	4043,68259	4043,87215	719,089868	719,123577
DH	2010	814,301263	814,543389	427,217209	427,344238
DK	2010	1817,81858	1818,00066	512,949694	513,001074
DL	2010	3261,35451	3261,59756	852,364003	852,427524
DM	2010	1065,34314	1065,39022	281,589766	281,602209
EE	2010	1606,97388	1607,05542	636,845827	636,878139
FF	2010	8677,24589	8678,72408	3764,171	3764,81223
GG	2010	7553,99493	7554,73804	5288,67503	5289,1953
HH	2010	4911,01247	4911,31021	2773,96033	2774,1285
60	2010	3472,75507	3473,00413	2390,08458	2390,25599
61	2010	521,199752	521,217128	146,485127	146,49001
62	2010	1569,19945	1569,25041	715,299704	715,322934
63	2010	1148,138	1148,1858	703,408141	703,437422
64	2010	2043,7555	2043,82955	1100,1344	1100,17426
JJ	2010	1766,71362	1766,78389	1250,31684	1250,36657
KK	2010	8876,77412	8877,08487	6679,14927	6679,38309
A-SVNM	2010	8988,8852	8990,86471	6579,24621	6580,69508

Table 10: Dyn sim1 2010 : : production et demande intermdiaires en biens i

		X		DIT	
		ref	sim1	ref	sim1
P-AA+AB	2010	6202,91948	6202,91948	4691,54343	4690,54801
P-111	2010	2704,20916	2704,20916	1328,64846	1330,4321
P-CB	2010	694,886317	694,886317	988,371513	988,972045
P-manuf	2010	20194,2472	20194,2472	13302,2189	13325,4114
P-DF	2010	1558,86634	1558,86634	2321,40673	2321,9461
P-DG	2010	3828,7681	3828,7681	3448,08838	3448,88617
P-DH	2010	572,340384	572,340384	533,557409	532,348858
P-DK	2010	1603,50285	1603,50285	1707,10839	1670,06621
P-DL	2010	3030,55251	3030,55251	2260,63762	2268,47395
P-DM	2010	1013,10011	1013,10011	714,275493	722,880162
P-40	2010	1440,16292	1440,16292	995,594986	996,479555
P-FF	2010	6899,49623	6899,49623	140,365028	139,053284
P-GG	2010	6947,35568	6947,35568	1111,67457	1112,67848
P-HH	2010	4887,53743	4887,53743	150,929585	151,003068
P-60	2010	3419,03652	3419,03652	1231,0327	1231,68833
P-61	2010	475,194702	475,194702	206,696723	206,825396
P-62	2010	1317,21227	1317,21227	451,448558	451,763856
P-63	2010	1442,99795	1442,99795	1569,97992	1571,07758
P-64	2010	2033,26995	2033,26995	1081,48814	1082,26684
P-JJ	2010	2096,04921	2096,04921	1314,9939	1315,78282
P-KK	2010	8876,23388	8876,23388	3766,89244	3767,22494
P-SVNM	2010	10232,7826	10232,7826	121,203733	121,20224

Table 11: Dyn sim1 2010 : production et valeur ajout de la branche J

		XS		VA	
		ref	sim1	ref	sim1
AA+AB	2010	8224,54951	8226,61782	6417,99692	6419,61092
CA	2010	2101,02214	2102,62142	1529,16783	1530,33183
CB	2010	675,589908	676,00801	304,8259	305,014547
A-MANF	2010	21078,4415	21086,923	6214,05704	6216,55742
DF	2010	1448,40488	1449,50299	163,960283	164,08459
DG	2010	3713,25139	3715,69568	660,329141	660,76381
DH	2010	817,219607	816,804561	428,748296	428,530546
DK	2010	1701,12336	1701,82087	480,02079	480,217611
DL	2010	3024,36055	3025,96186	790,424977	790,843483
DM	2010	977,355317	978,01092	258,332967	258,506255
EE	2010	1477,68093	1478,62705	585,606862	585,981813
FF	2010	8324,87921	8325,57157	3611,31507	3611,61542
GG	2010	7064,57646	7067,53204	4946,02518	4948,09443
HH	2010	4531,75175	4534,44455	2559,73684	2561,25786
60	2010	3217,19788	3218,94331	2214,20022	2215,40149
61	2010	476,316905	476,660493	133,870636	133,967202
62	2010	1433,62935	1434,66926	653,501791	653,97582
63	2010	1052,35573	1053,0742	644,727018	645,16719
64	2010	1869,67575	1870,99923	1006,42891	1007,14133
JJ	2010	1618,26408	1619,38287	1145,25796	1146,04974
KK	2010	8117,15568	8122,94785	6107,58972	6111,94793
A-SVNM	2010	8777,72469	8776,41706	6424,69123	6423,73414

Table 12: Dyn sim2 2010 : productions et valeur ajout de la branche J

		XS		VA	
		ref	sim2	ref	sim2
AA+AB	2010	8224,54951	8191,84294	6417,99692	6392,47447
CA	2010	2101,02214	2089,9418	1529,16783	1521,10333
CB	2010	675,589908	672,271519	304,8259	303,328644
A-MANF	2010	21078,4415	20986,5199	6214,05704	6186,95796
DF	2010	1448,40488	1440,77749	163,960283	163,096858
DG	2010	3713,25139	3694,64044	660,329141	657,019548
DH	2010	817,219607	815,552494	428,748296	427,873658
DK	2010	1701,12336	1693,67175	480,02079	477,918103
DL	2010	3024,36055	3010,19324	790,424977	786,72231
DM	2010	977,355317	972,425626	258,332967	257,029959
EE	2010	1477,68093	1470,34233	585,606862	582,698564
FF	2010	8324,87921	8295,34357	3611,31507	3598,50258
GG	2010	7064,57646	7033,48074	4946,02518	4924,25456
HH	2010	4531,75175	4509,77681	2559,73684	2547,32441
60	2010	3217,19788	3202,0203	2214,20022	2203,75442
61	2010	476,316905	473,853177	133,870636	133,178196
62	2010	1433,62935	1426,19929	653,501791	650,114893
63	2010	1052,35573	1047,01581	644,727018	641,455509
64	2010	1869,67575	1860,06901	1006,42891	1001,25769
JJ	2010	1618,26408	1610,01709	1145,25796	1139,4215
KK	2010	8117,15568	8075,33044	6107,58972	6076,11917
A-SVNM	2010	8777,72469	8751,77762	6424,69123	6405,69976

Table 13: Dyn sim2 2010 : production et demande intermdiaires en biens i

		X		DIT	
		ref	sim2	ref	sim2
P-AA+AB	2010	6202,91948	6196,41414	4691,54343	4702,12876
P-111	2010	2704,20916	2719,63857	1328,64846	1757,89271
P-CB	2010	694,886317	702,811003	988,371513	995,769785
P-manuf	2010	20194,2472	20142,1057	13302,2189	13082,1256
P-DF	2010	1558,86634	1632,39191	2321,40673	2884,59688
P-DG	2010	3828,7681	3821,0829	3448,08838	3409,56621
P-DH	2010	572,340384	572,146465	533,557409	535,699633
P-DK	2010	1603,50285	1597,18622	1707,10839	1711,85665
P-DL	2010	3030,55251	3019,21247	2260,63762	2246,97696
P-DM	2010	1013,10011	1010,16206	714,275493	705,201908
P-40	2010	1440,16292	1518,32519	995,594986	1042,69929
P-FF	2010	6899,49623	6922,87128	140,365028	140,80714
P-GG	2010	6947,35568	6933,21887	1111,67457	1105,53621
P-HH	2010	4887,53743	4877,40856	150,929585	150,438826
P-60	2010	3419,03652	3435,23287	1231,0327	1230,19382
P-61	2010	475,194702	474,643675	206,696723	205,779674
P-62	2010	1317,21227	1336,13131	451,448558	452,240749
P-63	2010	1442,99795	1441,684	1569,97992	1564,42273
P-64	2010	2033,26995	2031,45148	1081,48814	1078,23775
P-JJ	2010	2096,04921	2090,99147	1314,9939	1309,90642
P-KK	2010	8876,23388	8847,04536	3766,89244	3752,50937
P-SVNM	2010	10232,7826	10228,6329	121,203733	120,796497