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ENERGY TAXES WITH EXEMPTIONS IN GREECE: AN INPUT-OUTPUT ANALYSIS

By

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Abstract

This paper examines the economic implications of sectoral exemptions from energy taxation in Greece. This issue is being analysed in the context of an input-output model of the Greek economy calibrated to 1994 data. The insights that emerge from this study suggest that the level of prices and other macroeconomic variables rises, while competitiveness seems to improve. Furthermore, the exemption of high energy intensive industries from energy taxation causes a smaller shock in the Greek economy, relatively to the case of the low energy intensive branches exemption.
(JEL Classification: Q48, Q43).

Keywords: Energy taxation, exemptions, input-output analysis.

1. Introduction

Energy taxes that are unilaterally imposed in small open economies can have significant impacts on main macroeconomic indicators and prices of energy-intensive industries. In their attempt to keep the "cost of production" increases at low levels and to avoid adverse adjustment effects in specific industries, sectoral exemptions from environmental regulation are applied in many countries. Most countries that introduced energy taxes, such as Denmark, Sweden and Norway, grant energy-intensive industries a low tax rate (Baranzini et al, 2000, p. 403).

The macroeconomic and sectoral effects of energy taxes have been widely assessed over the past years. However, only a limited number of researchers have addressed exemption policies as means of mitigating potential negative effects of energy taxation. Bohringer and Rutherford (1997) considered the implications of sectoral exemptions from carbon taxation in West Germany

and found that exemptions significantly magnify the costs of emission reduction when compared to uniform taxes; in addition, exports decrease in spite of the exemptions, although less than with the uniform tax. Godal and Holtsmark (1998) estimated that removing exemptions in the Norwegian CO2 tax regime and replacing them by a uniform CO2 tax on all CO2 emissions would decrease profits in the emission-intensive industry by 18%. Hoel (1996) showed that carbon taxes should not be differentiated across sectors in the economy, as long as import and export tariffs on all traded goods are used.

Our paper investigates the effects accruing from the imposition of an energy tax in Greece both unilaterally and with exemptions of specific branches of production. The effects discussed include impacts on main macroeconomic and sectoral indicators as well as the prices - cost of production. The tool of analysis is an input-output model, whose structure is based on the environmental input-output tables of the Greek economy. In the model, the imposition of the energy tax is examined under three scenarios, whose differentiation is due to the exemption of specific economic sectors.

One innovative feature of the study is that the effects of energy taxation on prices and the cost of production on various branches of the Greek economy are examined for the first time, using environmental input-output tables. The paper also determines the extend to which exemptions affect the cost of production in specific sectors of the economy. Our findings may prove useful theoretical and empirical research for the regulators and the policy makers who take decisions regarding environmental and stabilization policies. Moreover, the structure of the input-output model is based on the framework of the environmental input-output tables of the Greek economy. Models in previous studies have made use of input-output analysis, but their structure was not based exclusively on the framework of the environmental input-output tables.

The remainder of this paper is organized as follows: Section 2 gives an overview of the input-output model structure. Section 3 describes the policy scenarios and section 4 presents the data and reports the computational results. Section 5 concludes.

2. An Overview of the Input-Output Model

The general features of the input-output model of the Greek economy (Pempetzoglou, 2003a, pp. 128-129) that has been developed in order to deter-

mine the macroeconomic and sectoral effects of energy taxation includes the following

1. The economy consists of 25 sectors of production. Table 1 presents the nomenclature of the economic branches.

2. There are seven energy products, namely electricity, lignite, coal, crude oil, oil products, natural gas and gas.

3. There are six greenhouse gases, namely CO_2, CH_4, $N2_O$, NO_x, CO and NMVOC.

4. Technology is considered as constant.

5. The energy tax burdens the intermediate uses of energy products in every sector of the economy, while the final consumption is exempted.

6. The level of subsidies, VAT and gross value added remain constant.

7. A behaviour coefficient matrix, that specifies the relation between intermediate energy uses of every sector and the gross value of production has been introduced.

8. All matrices of behaviour coefficients are presumed to be constant.

9. All behaviour coefficient vectors between final consumption and its components remain constant.

10. The gross product of every sector is an indicator for the price of the corresponding sector, in other words an indicator for the sector's "cost of production".

The input-output model operates as follows: Initially, an energy tax is imposed according to the intermediate consumption of the energy products in every branch of the economy. The energy tax imposition will increase the total tax revenues of the economy and assuming that the level of subsidies, VAT and gross value added remain constant, we lead up to the new level of the gross value of production. Due to the modification in the gross value of production, the matrices of the intermediate domestic and imported inputs will change (through the matrices of the behaviour coefficients matrices, that associate the matrices of the total level of intermediate domestic and imported inputs, respectively, with the gross value of production and they are assumed to be constant). The changes in the intermediate domestic and imported inputs matrices

will affect the total level of intermediate domestic inputs and imports and, furthermore, the total level of intermediate consumption in basic prices. The new level of the total intermediate consumption is determined according to the new intermediate domestic inputs matrix. Given the new levels of the total intermediate consumption and the gross value of production, the new level of the total final demand is defined. Additionally, by keeping fixed the behaviour coefficients matrix - the one that sets the relation between the components of the final demand (final consumption, gross fixed capital formation, changes in stocks and exports) and the total final demand - we conclude to the new levels of the final consumption, gross fixed capital formation, changes in stocks and exports. Assuming that the relation between the intermediate energy uses of every branch and the gross value of production remains constant, the new level of intermediate energy uses of every energy input and for every branch is defined. The energy tax will again be estimated according to the new level of energy uses and the procedure continues as above.

We now proceed to the specification of - the basic equations of - the input-output model of the Greek economy in algebraic terms. The model presumes the imposition of an energy tax on all energy sources according to their energy content. The energy tax revenues EET in every branch of production j for each energy product m are given by

$$EET_{mj} = ET_{mj} * IE\Pi_{mj} \quad (1)$$

where, ET stands for the energy tax level and IEP for the intermediate consumption of the energy products.

The total (all energy products) energy tax revenues (TEET) in every branch of the economy are derived from

$$TEET_j = \sum_{m=1}^{n} EET_{mj} \quad (2)$$

The energy tax (TEET) imposed on every economic sector is added to the rest taxation ($\overline{T_j}$) of the economy:

$$T_j = \overline{T_j} + TEET_j \quad (3)$$

The new gross value of production vector (XJ) results from the summation of the new total level of the intermediate consumption (CB), the taxation (T), the value added tax (VAT) and the gross value added (VA) minus the level of subsidies (S):

$$XJ_j = CB_j + T_j - S_j + VAT_j + VA_j \quad (4)$$

In the specific model, the gross values of domestic production (XIJ) in each branch j of the economy are considered as the product prices of the corresponding economic sector and the technological coefficient matrices a la Walras/Sraffa (Mariolis et al., 1997) for the domestic inputs (AD) are estimated by

$$AD_{ij} = \frac{XIJ^{d}_{ij}}{XJ_j} \quad (5)$$

The behaviour coefficients matrix of the imported intermediate consumption (AM) is given by

$$AM_{ij} = \frac{XIJIM_{ij}}{XJ_j} \quad (6)$$

where $XIJIM_{ij}$ stands for the sales of economic sector i to the economic sector j, that concern imported intermediate consumption.

The imports vector (IMPO) - equation 7 - is derived from the vertical summation of all elements of the imported inputs' matrix (XIJIM); the last ones stem from the product between the new gross value of production vector (XJ) and the matrix of the imported inputs' behaviour coefficients (AM) -equation 8.

$$IMPO_j = \sum_{i=1}^{n} XIJIM_{ij} \quad (7)$$

$$XIJIM_{ij} = XJ_j * AM_{ij} \quad (8)$$

The total behaviour coefficient matrix (AT) is the following

$$AT = AD + AM \quad (9)$$

The total intermediate domestic consumption vector in basic prices (NJ) is derived from the vertical summation of all elements of the intermediate domestic inputs matrix (XIJ^d):

$$NJ_j = \sum_{i=1}^{n} XIJ_{ij}^{d} \tag{10}$$

The total intermediate consumption vector in basic prices (CB) results from the summation of the total intermediate domestic consumption vector (NJ) and the total value of imports vector (IMPO):

$$CB_j = NJ_j + IMPO_j \tag{11}$$

The total value of intermediate uses (IC) in sector i can be found by the horizontal summation of all elements of the intermediate domestic inputs matrix (XIJ^d):

$$IC_i = \sum_{j=1}^{n} XIJ_{ij}^{d} \tag{12}$$

It is obvious that the total amount of inputs (XJ) is equal to the total amount of output (XI) in the economy, thus

$$XJj = Xli \tag{13}$$

The total final demand vector (FIT) comes from the difference between the total output vector (XI) and the total value of intermediate uses (IC):

$$FITi=XIi-ICi \tag{14}$$

The total consumption vector (FCI) results from the multiplication of the behaviour coefficient vector between final consumption and the total final demand vector (TFCIFIT) and the total final demand vector (FIT):

$$FCIi=TFCIFITi*FITi \tag{15}$$

The gross fixed capital formation vector (IG) emanates from the multiplication of the behaviour coefficient vector between the gross fixed capital formation and the total final demand vector (TIGFIT) and the total final demand vector (FIT):

$$IGi=TIGFIT_i*FIT_i \quad (16)$$

The changes in stocks vector (JI) is derived from the multiplication of the behaviour coefficient vector between the changes in stocks and total final demand (TJIFIT) and the total final demand vector (FIT):

$$JIi=TJIFITi*FITi \quad (17)$$

The exports vector (EXPP) in every branch of production i will arise from the multiplication of the behaviour coefficient vector between exports and total final demand (TEXPPFIT) and the total final demand vector (FIT):

$$EXPPi=TEXPPFIT_i*FIT_i \quad (18)$$

The new level of intermediate consumption of energy products (IEP) will result from the product between the behaviour coefficient matrix of the intermediate consumption of energy products (TIEPXJ) and the new level of the gross value of production (XJ) in every branch of production i. Next year, the new level of energy taxation will be calculated according to this new level of intermediate energy consumption

$$EP_{ij}=TIEPXJ_{ij}*XJ_j \quad (19)$$

As far as the level of prices (P) is concerned, we suppose that it is determined by the changes in the level of gross value of production (XJ) and moreover, the gross value added (Π) does not change as a result of product price changes. In equation 20, AD stands for the domestic inputs' behaviour coefficients matrix and AM stands for the imported inputs' behaviour coefficients matrix.

$$Pj = P_j*AD_{ij} + P_j*AM_{ij} + \Pi_j \quad (20)$$

Specifically, the level of prices (P) comes from the summation between the total level of intermediate consumption (AT), domestic and imported as well, the taxation (T), the subsidization (S), the value added tax (VAT) and the gross value added (VA):

$$P_j= P_j*AT_{ij} + T_j + S_j + VAT_j + VA_j \quad (21)$$

3. Policy Scenarios

The energy tax is imposed according to the intermediate consumption of the energy products and it is assumed to remain constant at its initial level during all the following years until the achievement of equilibrium in the economy. In our analysis, we consider three policy scenarios, summarized as follows

• *Scenario 1:* The *baseline* scenario (Pempetzoglou, 2003b, p. 106) considers the imposition of an economy-wide energy tax at the level of 1000 drs/TJ applied at an annual basis. The energy tax is common in all branches of the economy and it applies to all energy products.

• *Scenario 2:* The second scenario involves the implementation of an energy tax set at the level of 1000 drs/TJ applied at an annual basis. The energy tax applies to all energy products, but all high[1] energy-intensive branches of the economy are exempted.

• *Scenario 3:* The third scenario involves the implementation of an energy tax set at the level of 1000 drs/TJ applied at an annual basis. The energy tax applies to all energy products, but all low[2] energy-intensive branches of the economy are exempted.

4. Data and Empirical Results

4.1 Data

The main source of data used for this modeling effort was the environmental input-output table of the Greek economy for the year 1994. This table constitutes a useful and dynamic tool in studying the existing relations between the economy and the environment (Mylonas, 2000, p. 20) and its framework facilitates a straightforward and a more complex analysis of the effects of economic and environmental policies on both the economy and on the pressure on the environment (EUROSTAT, 1999). For the empirical analysis, some special software has been developed in the programme language Borland C+ + . The programme was based on the specific equations and restrictions of the model and it was developed in three different versions, according to the scenarios adopted.

4.2 Empirical Results

The results reveal significant differences between the three scenarios. In general terms, the energy tax imposition increases the value of most economic

variables. Price increases range between 0.26% and 0.58%, while exports increases far surpass imports increases and competitiveness improves. The energy tax exemption of high energy intensive sectors induces smaller changes in most economic variables of the Greek economy, compared to the baseline scenario as well as the case, where the energy tax exemption concerns the low energy intensive sectors. Additionally, the energy tax exemption of low energy-intensive industries induces smaller changes compared to the baseline scenario.

Table 2 presents the final results at the aggregate level. As far as the baseline scenario is concerned, prices increase by 0.58%; The greatest increases involve in the total value of taxation (14.87%) and the changes in stocks (14.89%). Gross fixed capital formation and final consumption increase only slightly - 0.08% and 0.26% respectively. Exports (2.46%) rise at a higher rate than imports (1.31%), thus competitiveness is positively affected. In the case where high energy intensive branches are exempted from energy taxation (scenario 2), the greatest increases appear in the total value of taxes (6.98%).

Exports rise by 0.76% and imports by 0.57%. Generally, the exemption of high energy intensive sectors causes the smallest possible shock in the Greek economy. In the final case, where the lower energy intensive sectors are exempted from energy taxation - scenario 3, prices increase by 0.30%. The greatest increases involve in the changes in stocks (15%) and the total value of taxes (7.88%) and the smallest appears in the case of final consumption (0.09%). Gross fixed capital formation does not change at all. Exports increase by 1.81% and imports by 0.79%.

Tables 3a, 3b and 3c present the final results of scenario 1, 2 and 3 respectively at the sectoral level. At this level, changes in the value of economic variables vary significantly. In general terms, the most significant changes involve in the value of total taxation, exports, final consumption and total final demand. Branches 12-basic metals and fabricated metal products, 13-metal products, 3-mining of coal and lignite and 7-wood products are the mostly affected ones.

More specifically, according to the first scenario, the greatest increases in the value of taxation appear in the branch 12-basic metals and fabricated metal products (187.95%), 3-mining of coal and lignite (70.83%), 6-manufacture of textiles (50.40%) and 13-metal products (47%). Sector 2-fishing and 24-organization services are the less affected ones in terms of taxation - increases involve 0.05% and 1.91% respectively. The greatest exports increases

appear in branches 12-basic metals and fabricated metal products (24.74%), 11-non-metalic mineral products (7.35%) and 7-wood products (5.3%). Exports decline in branches 4-metal ores (6.63%), 3-mining of coal and lignite (6.56%), 13- metal products (3.07%), 1-agriculture (1.48%) and others to a lesser extent. Imports greatest increases involve in 12-basic metals and fabricated metal products (11.26%) and 11-non-metalic mineral products (3.31%), while a decrease appears only in 2-fishing (-0.07%). Trade balance worsens in sectors 1-agriculture, 2-fishing, 3-mining of coal and lignite, 4-metal ores, 13-metal products, 17-sales of motor vehicles, 19-transports, 20-financial services, 21-real estate services and in all other sectors that realize no exports. Prices increase significantly in branches 12-basic metals and fabricated metal products (11.17%), 11-non-metalic mineral products (3.39%) and 10-chemical products (1.98%), they decline in branch 24-organization services by 0.02% and they remain constant in branch 2-fishing.

In the second scenario, taxation burdens only the low energy intensive industries, thus the greatest increases in the value of taxes concern sector 3-mining of coal and lignite (70.83), 13-metal products (47%), 14-machinery and equipment (33.12%), 10-chemical products (32.37%) and 25-recreational services (31.41%). Exports highly increase in sectors 3-mining of coal and lignite (26.39%), 7-wood products (6.12%) and 4-metal ores (3.93%) and decline in 1-agriculture (-2.28%) and 12-basic metals and fabricated metal products (-0.57%). Imports highly increase in 21-real estate services (2.07%), 10-chemical products (1.97%) and 13-metal products (1.91%) and slightly decline in 11-non-metalic mineral products (-0.08%), 2-fishing (-0.07%) and 18-hotel and restaurant services (-0.06%). The balance of trade worsens in 1-agriculture, 6-manufacture of textiles, 12-basic metals and fabricated metal products, 17-sales of motor vehicles, 19-transports and 21-real estate services. Prices greatest increases involve in 10-chemical products (1.98%), 9-manufacture of coke (1.78%), 4-metal ores (1.23%) and 8-pulp and paper products (1.15%). In the high energy intensive sectors prices remain constant, with the exception of sector 12-basic metals and fabricated metal products, where prices decline by 0.02%. Additionally, prices remain constant in sector 2-fishing and they decline in 24-organization services (-0.02%).

In the third scenario, energy taxation burdens only the low energy intensive sectors and therefore increases in the value of taxation appear only in the high energy intensive branches 12-basic metals and fabricated metal products (187.93%), 6-manufacture of textiles (50.4%), 11-non-metalic mineral products (33.1%), 18-hotel and restaurant services (27.25%) and 1-agriculture

(11.93%). Exports increase in 12-basic metals and fabricated metal products (25.29%), 11-non-metalic mineral products (7.4%), 6-manufacture of textiles (1.16%), 14-machinery and equipment (0.88%), 1-agriculture (0.82%) and 18-hotel and restaurant services (0.81%), while they decline mostly in 3-mining of coal and lignite (-32.43%) and 4-metal ores (-10.52%). Imports greatest increases involve in branches 12-basic metals and fabricated metal products (11.25%), 11-non-metalic mineral products (3.31%) and 21-real estate services (2.04%), while greatest decreases involve in 3-mining of coal and lignite (-0.15%), 4-metal ores (-0.09%), 2-fishing (-0.07%) and 15-electricity (-0.06%). The balance of trade worsens especially in the case of 3-mining of coal and lignite, 4-metal ores, 7-wood products, 13- metal products, 21-real estate services. Prices increase in 12-basic metals and fabricated metal products (11.17%), 11-non-metalic mineral products (3.39%), 6-manufacture of textiles (1.09%), 18-hotel and restaurant services (0.78%) and 1-agriculture (0.32%); in 24-organization services (-0.03%) and 13-metal products (-0.02%) prices decline, while in the rest of the cases they remain constant.

5. Conclusion

This paper examines the effects of energy taxes with exemptions in Greece both at the aggregate and the sectoral level. For this purpose, an input-output model of the Greek economy - based on the environmental input-output tables - has been developed. The energy tax is set at the level of l000drs/TJ and remains constant until the achievement of equilibrium in the economy. In the study, three scenarios have been adopted. According to the baseline scenario, the tax burdens equally all industries with no exemptions. The second scenario sets energy tax exemptions for the high energy intensive sectors, while the third exempts low energy intensive branches from energy taxation.

The empirical results show that the effects on the economic variables are mostly positive, at least at the aggregate level. The level of prices and other macroeconomic variables rises, while the balance of trade does not seem to be negatively affected. Furthermore, the exemption of branches with high energy consumption from the imposition of the energy tax causes a smaller shock in the Greek economy, compared to the case of the low energy consumption branches' exemption or the case of the common energy tax imposition in all branches.

Specifically, at the aggregate level, the increases in the price level range between 0.26% and 0.58%, depending on the scenario adopted. The balance of

trade improves by 0.19%-1.15%, while the total value of taxation rises by 6.98%-14.87%. At the sectoral level, results vary significantly between the various scenarios. The exempted industries seem to be the less affected by the imposition of energy taxes, according to the scenario adopted; taxation burdens mostly the sectors not exempted from energy taxation. In terms of prices, branches 12-basic metals and fabricated metal products and 11-non-metalic mineral products, with the exception of the second scenario, face increases, while slight decreases appear in branch 24-organization services under all scenarios. In terms of competitiveness performance, sectors 11-non-metalic mineral products and 14-machinery and equipment show significant improvements.

Overall, the findings of this study may prove useful theoretical and empirical research for the regulators and the policy makers who take decisions regarding environmental and economic policies. The choice of the scenario that should be adopted in practice will be dependent upon the aims and the objectives of the Greek government.

APPENDIX

TABLE 1

Nomenclature of the 25 industries classification of the Greek input-output tables

Serial number	NOMENCLATURE OF THE 25 INDUSTRIES
1.01	Agriculture, hunting and related service activities, products of forestry: logging related services
1.02	Fish and other fishing products
1.03	Mining of coal and lignite: extraction of peat, extraction of crude oil and natural gas, mining of nuclear materials
1.04	Manufacture of metal ores, other mining and quarrying products
1.05	Manufacture of food products and beverages, tobacco products
1.06	Manufacture of textiles, manufacture of clothes process and dyeing of fur, manufacture of tanning and dressing of leather
1.07	Wood and wood products
1.08	Pulp, paper and paper products, publishing printing and reproduction of recorded media
1.09	Manufacture of coke: refined petroleum products and nuclear fuel
1.10	Manufacture of chemicals and chemical products, manufacture of rubber and plastic products
1.11	Manufacture of other non-metalic mineral products
1.12	Basic metals and fabricated metal products
1.13	Fabricated metal products except machinery and equipment
1.14	Machinery and equipment, office machinery and computers, electrical machinery and apparatus, radio, television and telecommunications equipment and apparatus, medical precision and optical instruments, watches and clocks, motor vehicles trailers and semi-trailers, other transport equipment, furniture, recycling
1.15	Electricity, gas, steam and hot water, collection, purification and distribution of water
1.16	Construction work
1.17	Whole sale and retail sale of motor vehicles, whole sale and retail sale except vehicles, retail sale
1.18	Hotel and restaurant services
1.19	Transports, water transport services, air transport services, insurance and pension funding services, post and telecommunications

1.20	Financial intermediation services, insurance and pension funding services, services auxiliary to financial intermediation
1.21	Real estate services, renting services of machinery and equipment, computer and related services, research and development services, other business services
1.22	Public administration and defense services, sewage and refuse disposal services sanitation
1.23	Education, health and social work services
1.24	Membership organization services
1.25	Recreational, cultural and sporting services, other services, domestic services

TABLE 2

Final results at the aggregate level

Gross value of production	0.58%	0.26%	0.30%
Taxes	14.87%	6.98%	7.88%
Total intermediate domestic inputs	0.83%	0.39%	0.40%
Total intermediate consumption	0.83%	0.40%	0.41%
Imports	1.31%	0.57%	0.79%
Exports	2.46%	0.76%	1.81%
Final consumption	0.26%	0.16%	0.09%
Total final demand	0.49%	0.02%	0.28%
Gross fixed capital formation	0.08%	0.12%	0%)
Changes in stocks	14.89%	0.63%	15%
Intermediate energy inputs	2.39%	0.37%	2.02%

TABLE 3A

Final results at the sectoral level (scenario 1)

VARIABLES	1.01			1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13												
Gross value of production	0.32%	0%	1.11%	1.23%	1.04%	1.09%	0.93%	1.15%	1.78%	1.98%	3.39%	11.17%	0.98%	0.45%	0.17%	0.02%	0.16%	0.78%	0.15%	0.65%	0.03%	0.19%	0.09%	-0.02%	0.35%
Taxes	11.93%	0.05%	70.83%	16.30%	8.90%	50.40%	29.64%	28.61%	5.90%	32.37%	33.10%	187.95%	47%	33.12%	1.56%	2.47%	10.53%	27.25%	2.49%	13.44%	12.80%	13.59%	8.60%	1.91%	31.41%
Total intermediate domestic inputs	0.33%	0.02%	1.10%	1.24%	1.05%	1.08%	0.93%	1.15%	1.77%	1.97%	3.39%	11.18%	0.98%	0.45%	0.18%	0.01%	0.16%	0.78%	0.15%	0.65%	0.03%	0.19%	0.07%	0%	0.36%
Total intermediate consumption	0.85%	0.60%	1.33%	4.37%	0.82%	0.89%	0.40%	0.77%	0.80%	0.84%	0.78%	1.80%	1.92%	1.21%	2.08%	0.13%	0.83%	0.23%	0.32%	0.76%	0.52%	0.28%	0.33%	0.31%	0.25%
Imports	0.32%	-0.07%	0.92%	1.13%	1.04%	1.09%	0.90%	1.14%	1.77%	1.97%	3.31%	11.26%	1.91%	0.45%	0.10%	0.01%	0.25%	0.72%	0.16%	0.67%	2.07%	0.20%	1.03%	0%	0.36%
Exports	-1.48%	-0.26%	-6.56%	-6.63%	1.16%	1.14%	5.30%	1.74%	2.52%	3.39%	7.35%	24.74%	-3.07%	1.38%			-0.11%	0.79%	0.03%	0%	-0.27%				0.44%
Final consumption	-1.48%	-0.25%			1.16%	1.14%	5.31%	1.74%	2.52%	3.40%	7.35%	-24.74%	-3.07%	1.38%	-3%	0.01%	-0.11%	0.80%	0.03%	-0.01%	-0.28%	0.19%	0.08%	-0.28%	0.42%
Total final demand	-1.48%	-0.25%	-6.57%	-6.63%	1.16%	1.14%	5.30%	1.74%	2.52%	3.38%	7.35%	24.74%	-3.07%	1.38%	-3%	0.01%	-0.11%	0.80%	0.03%	-0.01%	-0.28%	0.19%	0.08%	0.28%	0.42%
Gross fixed capital formation	-1.48%						5.29%						-3.07%	1.38%		0.01%	-0.11%				-0.28%				0.42%
Changes in stocks	1.48%	0.21%	6.56%	-6.62%	-1.16%	1.14%	5.30%	1.77%	-2.52%	3.40%	7.36%	24.74%	-3.08%	1.39%			0.12%								
Intermediate energy inputs	0.32%	0.00%	1.11%	1.23%	1.04%	1.09%	0.93%	1.15%	1.78%	1.98%	3.39%	11.17%	0.98%	0.45%	0.17%	0.02%	0.16%	0.78%	0.15%	0.65%	0.03%	0.19%	0.09%	0%	0.35%

TABLE 3B

Final results at the sectoral level (scenario 2)

VARIABLES	1.01	1.02		1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.22	1.23	1.24	1.25
Gross value of production	0%	0%	1.11%	1.23%	1.04%	0%	0.93%	1.15%	1.78%	1.98%	0%	-0.02%	0.98%	0.45%	0.17%	0.02%	1.16%	0%	0.15%	0.65%	0.03%	0.19%	0.09%	-0.02%	0.35%
Taxes	0%	0.05%	70.83%	16.30%	8.90%	0%	29.64%	28.61%	5.90%	32.37%	0%	0%	47%	33.12%	1.56%	2.47%	10.53%	0%	2.49%	13.44%	12.80%	13.59%	8.61%	1.91%	31.41%
Total intermediate domestic inputs	0.68%	-0.12%	0.30%	0.15%	0.47%	0.07%	0.31%	0.57%	0.32%	0.63%	0.03%	0.37%	0.41%	0.31%	0.32%	0.08%	0.38%	0.23%	0.21%	0.56%	0.29%	0.27%	0.28%	0.11%	0.11%
Total intermediate consumption	0%	0%	1.11%	1.23%	1.03%	0%	0.93%	1.16%	1.79%	1.99%	0%	0%	1%	0.45%	0.16%	0.02%	0.16%	0%	0.16%	0.65%	0.03%	0.19%	0.09%	0.01%	0.35%
Imports	0%	-0.07%	0.92%	1.13%	1.04%	0%	0.90%	1.14%	1.77%	1.97%	-0.08%	0.05%	1.91%	0.45%	0.10%	0.02%	0.25%	-0.06%	0.16%	0.67%	2.07%	0.20%	1.03%	0%	0.36%
Exports	-2.28%	0.07%	26.39%	3.93%	1.33%	-0.02%	6.12%	2.04%	2.88%	3.66%	-0.07%	-0.57%	3.36%	1.73%			0.08%	0%	0.13%	1.17%	-0.13%				0.49%
Final consumption	-2.29%	0.07%			1.34%	-0.02%	6.14%	2.04%	2.88%	3.66%	-0.06%	0.56%	3.37%	0.50%	-0.09%	0.01%	0.08%	0%	0.13%	1.17%	-0.13%	0.19%	0.09%	-0.07%	0.52%
Total final demand	-2.28%	0.07%	26.39%	3.93%	1.33%	-0.02%	6.12%	2.04%	2.88%	3.66%	-0.07%	-0.57%	3.36%	1.73%	-0.10%	0.01%	0.08%	0%	0.13%	1.17%	-0.13%	0.19%	0.09%	-0.12%	0.51%
Gross fixed capital formation	-2.29%						6.12%						3.36%	1.73%		0.01%	0.08%				-0.13%				0.51%
Changes in stocks	2.28%	-0.11%	-26.39%	3.97%	-1.33%	-0.02%	6.12%	2.01%	-2.88%	3.66%	-0.05%	-0.58%	3.35%	1.73%			-0.12%								
Intermediate energy inputs	0.00%	0.00%	1.11%	1.23%	1.04%	0.00%	0.93%	1.15%	1.78%	1.98%	0.00%	-0.02%	0.98%	0.45%	0.17%	0.02%	0.16%	0%	0.15%	0.65%	0.03%	0.19%	0.09%	0%	0.35%

TABLE 3C

Final results at the sectoral level (scenario 3)

VARIABLES	1.01		1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19			1.22	1.23	1.24	1.25
Gross value of production	0.32%	0%	0%	0%	0%	1.09%	0%	0%	0%	0%	3.39%	11.17%	-0.02%	0%	0%	0%	0%	0.78%	0%	0%	0%	0%	0%	-0.03%	0%
Taxes	11.93%	0%	0%	0%	0%	50.40%	0%	0%	0%	0%	33.10%	187.93%	0%	0%	0%	0%	0%	27.25%	0%	0%	0%	0%	0%	0%	0%
Total intermediate domestic inputs	0.17%	0.55%	0.99%	4.17%	0.34%	0.79%	0.07%	0.18%	0.46%	0.20%	0.74%	1.42%	1.51%	0.88%	1.74%	0.04%	0.43%	-0.03%	0.10%	0.18%	0.22%	0.07%	0.11%	0.16%	0.14%
Total intermediate consumption	0.33%	0.01%	0%	0%	0%	1.08%	0%	0%	-0.01%	0%	3.39%	11.17%	-0.03%	0%	0.01%	0%	0%	0.78%	-0.01%	0%	0%	0%	-0.02%	-0.01%	0%
Imports	0.32%	-0.07%	-0.15%	-0.09%	0.00%	1.09%	-0.03%	-0.01%	0%	-0.01%	3.31%	11.25%	0.89%	0%	-0.06%	0%	0.09%	0.72%	0%	0%	2.04%	0%	0.93%	0%	0.01%
Exports	0.82%	-0.24%	-32.43%	-10.52%	-0.16%	1.16%	-0.73%	-0.29%	-0.38%	-0.26%	7.40%	25.29%	-6.57%	0.88%			-0.17%	0.81%	-0.08%	-1.21%	-0.13%				-0.11%
Final consumption	0.82%	-0.24%			-0.16%	1.16%	-0.70%	-0.29%	-0.38%	-0.26%	7.41%	-25.30%	-6.55%	-0.34%	-2.87%	0%	-0.17%	0.81%	-0.08%	-1.20%	-0.13%	0%	-0.01%	-0.12%	-0.09%
Total final demand	0.82%	-0.24%	-32.44%	-10.52%	-0.16%	1.16%	-0.73%	-0.29%	-0.38%	-0.26%	7.41%	25.29%	-6.57%	0.88%	-2.87%	0.00%	-0.17%	0.81%	-0.08%	-1.20%	-0.13%	0%	-0.01%	-0.18%	-0.10%
Gross fixed capital formation	0.82%						-0.73%						-6.57%	0.88%		0%	-0.17%				-0.13%				-0.10%
Changes in stocks	-0.82%	0.21%	32.43%	-10.60%	0.17%	1.16%	-0.73%	-0.32%	0.39%	-0.26%	7.41%	25.30%	-6.56%	0.88%			0.12%								
Intermediate energy inputs	0.32%	0.00%	0.00%	0.00%	0.00%	1.09%	0.00%	0.00%	0.00%	0.00%	3.39%	11.17%	-0.02%	0.00%	0.00%	0.00%	0.00%	0.78%	0%	0%	0%	0%	0%	0%	0%

Notes

1. High energy intensive are considered to be the branches whose intermediate consumption of energy products ranges between 5.94 TJ and over.

2. Low energy intensive are considered to be the branches whose intermediate consumption of energy products ranges between 0 TJ and 5.94 TJ.

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