The effect of the European Energy Tax Directive reform on prices in Europe

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Abstract:

To address risks related to atmospheric contamination, it is widely accepted the need for policy instruments aimed to reduce emissions. Policy intervention seeks to reduce polluting behaviours by encouraging a more respectful conduct and the use of more efficient technologies. The European Union (EU) counts with two important economic mechanisms for emission control at European level: the Energy Taxation Directive (ETD), an environmental taxation approved in 2003 that affects the price of energy products, and the Emissions Trade System (ETS), a cap and trade system introduced in 2005 that directly affects the CO2 emission quantity. In 2011, the European Commission (EC) proposed a new version of the ETD. The main aim of the proposal was to increase the effectiveness of the instrument through stronger fiscal pressure on energy products and to coordinate the environmental taxation with the ETS, establishing a comprehensive and consistent CO2 price signal for sectors not included in the EU-ETS. However, in May 2012 the European Parliament delivered a setback for the EC plans regarding the ETD and the process of updating stopped. The main worry seemed to be the effect of such proposal on competitiveness; in particular the concern regards sectors that would be mostly affected given the intensive use of energy products, like transport industry.

The aim of this study is to analyse the effect that the 2011 ETD reform would have on the level of prices, if implemented, particularly in the EU countries where this reform would imply to increase energy taxes. Using data from the World Input Output Database (WIOD) project, the main finding is that the new energy tax regime would have a really low impact on prices. Thus, since prices would not be strongly affected by the reform, there will be no drawbacks for competitiveness and distributional implication; but, on the other hand, this result will also imply a low capability of this reform to cause changes in consumption and production towards less environmental pressures.

Keywords: Environmental Tax Price Impact; European Union; World Input-Output Database (WIOD); Multi-Regional Input-Output Price Model.

JEL classification codes: C67, D57, H23, Q48, Q53.

1. INTRODUCTION

To address risks related to atmospheric contamination, what is widely accepted is the need for policy instruments aimed at reducing emissions. Emission control policies are primarily focused on energy products used by the production system and by end-users since emissions are basically produced by the combustion of these products. Through policy interventions, legislators try to reduce polluting behaviours and to encourage a more respectful conduct and more efficient technologies. There are several tools for emission control, many of which use economic mechanisms to influence the existing patterns of production and consumption. These instruments, generally classified in price-mechanisms and quantity-mechanisms, should minimize abatement costs by creating an incentive to develop alternative technologies or to use alternative energy products.

Looking at Europe, although each member state has the legal competency to regulate emissions, also the European Union (EU) takes part in this process. Today there are two important economic mechanisms at European level for emission control: the Emissions Trade System (ETS), a cap and trade system that directly affects the emission quantity, and a system of environmental taxes that affect the price of energy products.

With regard to environmental taxes, the European Energy Taxation Directive (ETD) approved in 2003 (European Council, 2003) governs the current regime of energy taxation. This regulation came from a process started in the early 1990s that was a first attempt to harmonize carbon and energy taxes in the EU (European Commission, 1992, 1995).[1] Given this aim, the current directive fixed minima tax rates on the use of energy products[2] that countries must take into account when enacting their national implementations. Although the legislation clearly reflected environmental concerns, it was also shaped by the need to ensure that the internal market operated correctly.[3] Considering the dependence and intensity in the use of energy products for some industries and the impact of taxation in terms of competitiveness, the 2003 European ETD proposed a complex system of reductions and exemptions that has been denounced as a factor that might

[1] See Padilla and Roca (2004) for a detailed description of the regulation process and stages during the 1990s.
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countries as a result of divergent tax rates.

reduce the environmental effectiveness of these taxes (Ekins and Speck, 1999). Moreover, in the current directive there are other weaknesses that could suggest the need for a legislative renewal and improvement: in particular, these weak points are the absence of a signal that clearly reflects CO_2 emissions and the energy content of the products, the absence of incentives to develop markets for alternative energies, and the absence of coordination with the EU-ETS (double burden or loopholes to evade responsibility for emissions are in some cases possible).

These reasons explain why the EC proposed a new version of the European ETD in 2011 (European Commission, 2011a). The main aim of the new proposal is to increase the effectiveness of this tool through the implementation of three main changes. Firstly, the proposal fixes higher minimum rates in an attempt to cause a shift toward less polluting production and consumption patterns. Secondly, existing energy taxes would be split into two components that, taken together, would determine the overall rate at which a product is taxed. One component is based on the energy content -euro per gigajoule (GJ)-. The other component is specifically linked to CO_2 emissions, in order to complement the EU-ETS and establish a comprehensive and consistent CO_2 price signal.[4] Finally, the new text also tries to restructure and simplify the framework of reductions and exemptions, limiting them to the energy taxation based on the energy content of products and removing unjustified subsidies for certain fossil fuels (i.e. diesel and coal).

Nonetheless, the Commission's proposal was not supported by the European Parliament and the 2003 directive continues in force: in May 2012 the Parliament delivered a setback for the EC plans and the process of updating stopped. The main worry seemed to be the effect of such proposal on competitiveness caused by the induced increase in prices. In particular the concern regarded sectors that would be mostly affected given the intensive use of energy products, like the transport industry. On the other hand, advocates of the reform argued that the impact of the environmental tax reform, for example on diesel prices, has been overestimated since today tax rates in the majority of the EU countries are higher than the new minima proposed.[5] Given

[4] The new minimum rates will be introduced in stages until 2018. So that, the tax based on CO_2 emission would be 20€/tone of CO_2 as of 2013 and it would be zero for all sources of energy that currently are or will in the future, be recognized as CO_2-free. Regarding the tax based on energy content it would gradual increase, by 2018, to 9.6€/GJ if products are used as motor fuel, to 0.15€/GJ if products are used for heating.

[5] Astrud Lulling, the Parliament's report lecturer, referred to direct negative social impact from higher prices for coal, natural gas, heating oil and diesel oil. Three major European automobile manufacturer associations (ANFIA for Italy, CCFA for France and VDA for Germany) have issued a joint statement calling on the European Parliament and the

these different positions, one might ask whether the 2011 ETD proposal is really an obstacle to the competitiveness of key sectors of the European economy or, conversely, whether blocking this reform might represent a drawback to a process that could bring environmental improvements and that could boost the economy. [6]

Environmental taxes, as emission control tools, are largely analysed as the vast literature on the topic shows.[7] Studies go from basic economic analyses on functions of abatement costs to analyses of more complex implications, like the effects of environmental tax on competitiveness and the case of double dividend, or the tax incidence and the effects in terms of social welfare and redistribution. Anyway environmental taxes are instruments directly affecting prices: this is the reason why, before performing all these types of studies, we believe it is appropriate to assess the effect on prices that any implementation or reform of an environmental tax would cause.

So, the aim of this study is to analyse the effect on the level of prices that the 2011 ETD reform would have, if implemented, particularly in the EU countries where this reform would imply an energy tax increase. Two main outcomes of this partial analysis are possible. On the one hand, if prices were not strongly affected by the reform, the proposed change would be ineffective to cause an improvement in consumption and production regarding environmental pressures. On the other hand, if the overall level of prices effectively changed due to the reform, the new taxation could induce a change in consumption pattern and provide incentives to look for more efficient alternatives in production. Although the analysis proposed seems relevant in both scenarios, in the second case further and wider analyses would be needed. In fact, it is realistic to assume that, facing strong price changes, producers and consumers would change their consumption choices and inputs structure, causing in this way new changes in prices. Moreover, if the reform caused a strong increase in prices it would be important to verify its effects in terms of

Council to disassociate them from the proposed increase in taxation diesel. On the other hand, Algirdas Semeta, commissioner for taxation and customs, seconded the opinion about the overestimation of the impact on diesel prices. Moreover he stressed that diesel use is a major concern for the EC because of the European dependence from import, which causes prices variations stronger that the prices variation the reform would imply. See ANFIA, CCFA, VDA (2011), Euractiv (2012), Greenreport (2012), Reuters (2013).

[6] The EU climate and energy 20-20-20 strategy marks three goals by 2020: a 20% cut in emissions, a 20% improvement in energy efficiency and a 20% share of renewable energies. Blocking the reform could means a hindrance to it because it stopped a taxation shift from labour to pollution and energy use to help create jobs and stimulate growth (the so-called green tax shift).

[7] See Section 2 in this paper.

competitiveness and income distribution. Using data from the World Input Output Database (WIOD) project we propose a multiregional price model, which allow us to consider international trade flows within the EU and with the rest of the world. The main finding of this study is that the new energy tax regime would have a really low impact on prices.

The paper is organized as follows. Section 2 proposes a review of the literature, section 3 introduces the methodology, and section 4 describes the database. Finally, results and conclusions are presented in Section 5 and 6, respectively.

2. LITERATURE REVIEW

As mentioned above, the literature on the analysis of environmental taxes is extensive, covering a wide range of different issues of this topic, which go from theoretical to applied analysis.[8]

Looking at applied analyses, some studies propose a description of current or past experiences that countries have implemented (see for instance, Ekins 1999, Bosquet 2000, Hasselknippe and Christiansen 2003, Stavins 2003, Vehmas 2005, Cauter and Meensel 2009, or Ekins and Speck 2011). Nevertheless, the application of environmental taxes entails different effects on the economy that require to be analysed, like the effects of environmental tax on competitiveness, the case of double dividend, or the tax incidence and the effects in terms of social welfare and income redistribution. Moreover, as a fiscal instrument, they are an important source of revenue; and because of their direct effects on prices, they might serve for improving energy efficiency by influencing producers' and consumers' behaviour. Within this context, partial equilibrium analyses consider these different effects individually, often in a limited time perspective, focusing on the effect in terms of efficiency or the environmental effect (as Cornwell and Creedy 1996, Bjorner and Jensen 2002), on the welfare effect (Tiezzi 2005, Martini 2009, Galinato and Yoder 2009), or the effect on consumers and income distribution (as Klinge Jacobsen et al. 2003, Padilla and Roca 2004, Wier et al. 2005, Kerkhof et al. 2008). On the contrary, general equilibrium analyses offer a complete

[8] Some theoretical studies are, amongst others, Aldy et al. (2008), Aldy et al. (2009), Andersen (2009), Ekins (2009), Fullerton et al. (2010), Jacobs and van der Ploeg (2010), Clarke (2010) and Weisbach (2011).

description of the interactions among economy, energy and environment, focusing on a longer time interval. These analyses usually propose computational general equilibrium models (as Barker et al. 1993, Sinko 1996, Boehringer 2002, Bae and Shortle 2005, Roger 2011), or hybrid models that use together different techniques as input-output analysis, econometrics or energy analysis (see for example European Commission 2011b). These analyses usually predict the long-term effects of energy taxes, looking at the welfare effect related to the double dividend hypothesis, the environmental and macroeconomic impacts, and the effects for consumers and producers in terms of income distribution, energy efficiency and sector impacts.

As it is known, general equilibrium models are able to offer a more complete description of the effect of energy taxes, and they are often used due to their explanatory capacity and due to their formal and theoretical strength. However, sometimes researchers or policymakers are interested in analysing the direct effect of a policy, that is the induced price variation. In such cases the analysis can be interpreted as a short-run analysis of a first impact of policy changes on prices before producers were able to change their input combinations or before the government was able to re-distribute through other policy changes. But this kind of analysis turns out to be adequate if results do not show great variations in prices: in this case it is realistic to assume no important changes in producers' and consumers' choices, and adding simplifying assumptions could alter results without adding any useful information. On the other hand, if results revealed significant variations in prices, deeper analyses (such as general equilibrium models) would be needed.

The input-output price model is typically used to investigate the effect on prices of different types of energy related policy or other environmental instruments. Among others, Han et al. (2004) investigate three changes related to the electric power sectors (hydroelectric, fossil fuel, nuclear, non-utility) in Korea for the period 1985-1998: the effect of electric supply investment, electric supply shortages, and a rise in the electric rates. For the third simulation they use an input-output price model imposing a 10 % increase in electrical rates, and they find the non-utility electric power sector to have the greatest impact on prices. After computing the water embodied in the production and export of Andalusia's economy, Dietzenbacher and Vélazquez (2007) simulate the effect of the introduction of the cost of water (1 euro per 1000 litres) in 1990. They find the agricultural produce prices to be the most affected. Llop (2008) analyses the economic impact of alternative water policies implemented in the Spanish economic system for the year 2000: a 40% tax rate on the water use, improvements in technical efficiency (20% decrease in water consumption combined with a 20% increase in water production), and a combination of both policies. She finds that the combination of a tax and efficiency improvements avoids increases in prices and reduces water consumption. Llop and Pié (2008) propose a similar analysis focused on the energy activities for Catalonia in 2001, considering lower rate changes (10% increase in taxes, 10% decrease in energy consumption). The main difference is that while Llop (2008) finds that efficiency improvements cause the Jevons' paradox and an increase in water consumption, Llop and Pié (2008) do not find such evidence for efficiency improvements in the Catalans energy sectors. Liu et al. (2009) analyse the impact of different policy instruments focused on the electricity production and consumption: a 1% increase in the electricity price, a 1% decrease in the intermediate electricity consumption, the combination of the two previous policy instruments. They use an input-output price model modified to take into account the Chinese control on the electricity price for some specific sectors. Also in this case, as in Llop (2008) and Llop and Pié (2008), the combination of both policies is the most neutral instrument in terms of induced prices change. The proposal of Choi et al. (2010) is focused on the effects of a hypothetical carbon tax of $50/ton, applied for the 2002 U.S. economy. They consider several input–output modelling equations sequentially, putting together input-output price model, short term change in consumers' demand (demand elasticity) and input-output quantity model. As regards the effect on prices, although the percentage prices of electricity sectors are affected the most since they are the primary sources of carbon emission, sectors with no direct use of fossil fuel for the production are affected indirectly due to their indirect reliance on fossil resource. Also Mongelli et al. (2010) propose a study that puts together input-output price model, input-output quantity model and an econometric estimation of a household consumption model in order to see the effect on the emission level of a hypothetical CO_2 emission taxation of about 10 euro per tonne of emissions. They find a limited decrease in emissions.

Although the input-output price model has already been used to study the effect on prices of different environmental policies, as the above studies show, most of these analyses simulate the effect on prices considering hypothetical policy. Unlike the studies analysed so far, Nguyen (2008) applies the input-output price model to verify the impact on prices of a real policy that is the Vietnamese Government's proposal to increase taxes on electricity, using data referred to 2000. The author finds that a 2 US cent per kWh increase in electricity tariff does not cause a strong increase in the overall price level.

In the same way, also this paper focuses its interest into the analysis of a real policy: the effect on prices in the EU countries of the environmental policy reform proposed by the European Commission. In particular, we propose a multiregional price model in order to take into account all the interrelations among all the EU countries and between EU and the rest of the world.

3. METHOD

The method used has two main steps. First, it is necessary to work out what is the additional tax per unit of product that each sector would face if the reform proposal will be implemented. Second, the analysis moves toward an input-output price model that permits to verify what is the impact of this additional taxation on the overall level of prices of the economy.

To work out the additional tax per unit of product that the new environmental taxation would imply, it is necessary to know, for every sector, what is the consumption of the different energy products per unit of output, and what is the additional taxation on every energy product.

For the first piece of information, we refer to the basic formulation of the input-output energy analysis. Using the information contained in the input-output tables, the input-output energy analysis determines the total amount of energy required directly and indirectly for the production of different goods. Considering energy flows in physical units it is possible to use an identity similar to the basic input-output accounting identity:[9]

$$\mathbf{Ei} + \mathbf{q} = \mathbf{g} \qquad [1]$$

E is the matrix of energy flows from energy-producing sectors to all sectors as consumers of energy, **q** is the sector of energy deliveries to final demand and **g** is the vector of total energy consumption, all

[9] Matrices are indicated by bold, upright capital letters; vectors by bold, upright lower case letters; and scalars by italicized lower case letters. Vectors are columns by definition, so that row vectors are obtained by transposition, indicated by a prime. A circumflex indicates a diagonal matrix with the elements of any vector on its diagonal and all other entries equal to zero. The notation **i** is used to represent a column vector of 1's of appropriate dimensions.

measured in physical units.[10] For the aim of the following analysis, since the forward and backward effects caused by the interrelations among sectors are taken into account through the input-output price model, only the coefficients of direct requirements expressed in physical terms per dollar's worth of production are used. It is possible to define the matrix **D** of direct energy coefficients, where $d_{kj} = e_{kj} / x_j$ describes the amount of energy products required directly to produce a dollar's worth of output. Energy products are expressed in energy units. Moreover, every energy product is differentiated in the different purposes in which it can be used.[11] In matrix terms:

$$\mathbf{D} = \mathbf{E}\hat{\mathbf{x}}^{-1} \qquad [2]$$

The coefficients found are expressed in quantity of energy per unit value of product.

The second piece of information needed is the increase of the tax rates that the proposal's implementation would cause. The matrix $\mathbf{R}$ is computed: for every sector j and for every energy product per type of use k, r_{kj} is the difference between the new minima rate proposed and the present rate. The elements of this matrix are expressed in euro per physical unit of energy.

To know what is the additional tax per unit of product that the new environmental taxation would imply for every sector, the matrix $\mathbf{t}$ is computed in the following way:

$$\mathbf{t} = (\mathbf{D} \otimes \mathbf{R})\mathbf{i} \qquad [3]$$

Where i is a column vector of appropriate dimension. $\mathbf{t}$ is the vector of environmental tax increase per unit of output for every sector j, expressed in euro per unit value of production.

The second step is a simulation of the effect of the new minima rates on prices through an input-output price model. The price model presented above is generally used to measure the impact on prices

[10] From this starting point, two different formalizations are typically used in the input-ouptut energy analyses. The simplest one is in physical terms, while a second formalization in hybrid units (physical and monetary terms) is proposed in order to differentiate between primary and secondary energy. See Miller and Blair (2009), cap. 12, for a deeper explanation of the main formalizations used in input-output energy analyses.

[11] Energy products are denoted with h ($h=1,\ldots, p$). Each energy product is further classified in y different purposes in which it can be used ($y=1,\ldots,u$). So, we can distinguish m different energy products categories ($k=1,\ldots,m$) with $m=p \times u$.

throughout the economy of a change in the cost of primary inputs in one or more sectors.[12] However, this price model can also be applied to analyse the impact of new costs.

The use of the input-output framework to detect the effect on prices of changes in the environmental regulation is mainly due to its capability to take into account the interconnections among different sectors of the economy. The input-output price model uses the information contained in the inter-industry delivery matrix to express a production model characterized by homogeneous sectors, constant returns to scale, fixed inputs proportions and constant prices for each sector (Miller and Blair, 2009). The *j-th* column of an input-output table expressed in monetary terms reveals the information of the total value of the *j-th* industrial output and the total production costs:

$$x_j = \sum_{i=1}^{n} z_{ij} + v_j \qquad [4]$$

Where z_{ij} is the input that the j-th sector needs from the i-th sector, and v_j is the value added for each unit of j. In matrix terms:

$$\mathbf{x}' = \mathbf{i}'\mathbf{Z} + \mathbf{v}' \qquad [5]$$

By assuming the price of each good is equal to 1, substituting $\mathbf{Z} = \mathbf{Ax}$, and post-multiplying by $\hat{\mathbf{x}}^{-1}$ it is possible to obtain:

$$\mathbf{i}' = \mathbf{i}'\mathbf{A} + \mathbf{v_c}' \qquad [6]$$

$\mathbf{v_c}'$ is a vector containing value added per unit of output for every sector, $\mathbf{A}$ is the input coefficient matrix. The right-hand side of the last expression is the cost of inputs per unit of output. The right-hand side of the expression is the prices vector: each price is indexed, equal to 1.

By denoting base year index prices by p_j' it is possible to express the input–output price model as:

$$\mathbf{p}' = \mathbf{p}'\mathbf{A} + \mathbf{v_c}' \qquad [7]$$

$$\mathbf{p}' = \mathbf{v_c}'(\mathbf{I} - \mathbf{A})^{-1} = \mathbf{v_c}'\mathbf{L} \qquad [8]$$

[12] This price model is called *cost-push input output price model* (Oosterhaven 1996 and Dietzenbacher,1997).

$\mathbf{L}$ is the Leontief matrix that captures both direct and indirect effects of changes in value added and it expresses the technical structure of the production process.

Then, a new price vector is considered, where prices are affected by the new additional cost per unit value of output $\mathbf{t}$ defined by expression (3):

$$\tilde{\mathbf{p}}' = \tilde{\mathbf{p}}'\mathbf{A} + \mathbf{v}_c' + \mathbf{t}' \qquad [10]$$

$$\tilde{\mathbf{p}}' = (\mathbf{v}_c' + \mathbf{t}')(\mathbf{I} - \mathbf{A})^{-1} = (\mathbf{v}_c' + \mathbf{t}')\mathbf{L} \qquad [11]$$

Therefore, the increase in prices is given by the difference between the new prices vector and the old one:

$$\tilde{\mathbf{p}}' - \mathbf{p}' = (\mathbf{v}_c' + \mathbf{t}')\mathbf{L} - (\mathbf{v}_c')\mathbf{L} = (\mathbf{t}')\mathbf{L} \qquad [12]$$

4. DATABASE

4.1 DATABASE DESCRIPTION

The following section is devoted to the description of the three main databases used for the analysis: multi-regional input output (MRIO) tables, energy use tables and information on current and proposed tax rates. The MRIO tables used are the world input output tables, described in section 4.1.1., made available by the WIOD project. Also for energy use tables, described in section 4.1.2., the main sources used are the environmental accounts belonging to WIOD. When necessary, additional information is taken from energy balances of the International Energy Agency (IEA), and from the WIOD socio-economic accounts. Finally, the last section (4.1.3.) describes the documents that contain information about the existing taxes on energy products in European countries, and the new rates proposed by the European Commission.

4.1.1. MRIO tables

The MRIO tables used have been made available by the WIOD project since April 2012 (WIOD, 2012a). The WIOD database consists of four main time series: world input-output tables and international supply and use tables (WIOT-ISUT); national input-output tables and national supply and use tables (NIOT-NSUT); socio-economic accounts (SEA); environmental accounts (EA). In particular, for MRIO tables, the study considers the information contained in the first series. These data, available for the years 1995-2009, refer to 27 European counties, 13 other major countries in the world and all the remaining regions aggregated in a single "rest of the world" region.[13] Among the different tables contained in the WIOT-ISUT series,[14] the world input output table at current prices for the year 2008 is used. It is a symmetrical table "industry by industry", offering a desegregation of about 35 sectors for each country.[15] This industry-type table is estimated under the assumption of "fixed product sales structure", that states that each product has its own specific sales structure, irrespective of the industry where it is produced. Data are expressed in monetary terms (millions of euro).

4.1.2. Energy use tables

For energy use tables, data used are the EA made available by WIOD. This satellite accounts have the same scope as MRIO tables: same period (1995-2009), country coverage (27 European counties, 13 other major countries in the world and the remaining "rest of the world" region) and sector breakdown (35 sectors). The WIOD EA consist of energy accounts, emissions accounts, material extraction, land use and water use. The main tables used are, among the energy accounts,[16] the tables "Emission relevant energy use" for the year 2008 (WIOD, 2012b). Data include energy flows in physical terms (terajoules, TJ), related to 26 energy products,[17] derived from the gross energy use but excluding the non-energy use and the inputs for transformation into energy products.

[13] See Appendix 1 for the complete list of countries.

[14] The full set of the WIOT-ISUT tables contains international supply and use tables at current and previous year prices, with use split into domestic and import by country (35 industries by 59 products), world input output tables at current and previous year prices (35 industries by 35 industries), and interregional input output tables for 6 regions (35 industries by 35 industries). The used classification is the "National Classification of Economic Activities" (NACE) Rev 1.1 (Eurostat 2002), for industries, and "Classification of Product by Activities" (CPA) (Eurostat 2008), for products.

[15] See Appendix 2 for the complete list of sectors.

[16] Two time series constitute the energy accounts: "Gross energy use" and "Emission relevant energy use".

[17] The 26 energy products are further classified in six groups as following: coal (hard coal and derivatives, lignite and derivatives, coke), crude and feedstock (crude oil and feedstock), petroleum products (diesel oil for road transport, motor gasoline, jet fuel, light fuel oil, heavy fuel oil, naphtha, other petroleum products), gases (natural gas, derived gas), renewables and wastes (industrial and municipal waste, bio-gasoline including hydrated ethanol, bio-diesel, bio-gas, other combustible renewables), electricity and heat (electricity, heat, nuclear, hydroelectric, geothermal, solar, wind power, other sources).

When necessary, data are integrated and transformed using additional information from IEA extended world energy balances, from IEA series on world energy prices, and from the database Odyssee, as described in details in section 4.2.

4.1.3. Energy taxation

As regards energy taxation, it is necessary to know, on the one hand, what the present regime applied in the European countries is, and, on the other hand, what changes the implementation of the Commission proposal (European Commission, 2011a) would cause.

Regarding the current environmental taxation regime, two sources of information are used. The first one is the European Commission's "Taxes in Europe" database (TEDB), an on-line information tool that provides, for each member state, a document describing the main taxes in force for all energy products, detailing also exemptions, reductions and special regimes (European Commission, 2011c). Moreover, the European Commission provides a document (European Commission, 2012) that actualizes to 2012 the tax regimes implemented in the European countries for the main energy products.

The main document that describes the new regime is the 2011 European Commission's proposal (European Commission, 2011a) that amends the Council Directive (European Council, 2003) regulating the Community framework for the taxation of energy products and electricity.

4.2 DATABASE TRANSFORMATIONS

The necessary database transformations regard the energy use table selection and transformations, described in section 4.2.1., and the compilation of a matrix of tax variation for different energy products, sectors and countries, described in section 4.2.2.

4.2.1. Energy use table transformations

For the energy use table, firstly it is necessary to select data depending on what energy products are taxed through the ETD and what products are available in WIOD EA. Two main differences exist between ETD and WIOD regarding energy products. The ETD regime distinguishes between products used as motor fuel and products used for heating,[18] but this distinction does not exist in WIOD data; moreover, there is no a strict correspondence between WIOD and ETD products classification. For these reasons some transformations are applied, using the IEA energy balances as additional information when necessary.[19]

The main products that are taxed through the ETD are: petrol used as motor fuel; gas oil, kerosene, liquefied petroleum gas (LPG) and natural gas used as motor fuel as well as for heating; heavy fuel oil (HFO) and coal and coke used for heating; finally electricity. For some of these products a correspondence exists between the ETD classification and the classification used in the WIOD database, as shown in table 1.

Three uses - kerosene (used as motor fuel and heating) and natural gas (used as motor fuel) -are excluded from the analysis for the following reasons. As regards kerosene, it is used as motor fuel basically by the aviation sector that is exempted from the energy component of the tax for competitiveness reasons and is exempted from the CO_2 component of taxation because it is an ETS sector. As regards kerosene used as heating, when consumption is relevant, households rather than economic sectors basically use it. Finally, as regards natural gas used as motor fuel, it is not considered in the analysis because the IEA considers the amount consumed in most countries (except for Bulgaria, France, Germany, Italy, Sweden) as irrelevant, assigning data (IEA, 2012a) a value equal to zero.

As regards LPG, two transformations are needed. Since in WIOD LPG is classified in the category “Other petroleum products” along with other nine energy products[20], it is necessary to desegregate the WIOD category into the different components. This is done using IEA energy balances information that have been used for computing the WIOD category “other petroleum products” (IEA, 2012a). Then, it is necessary to distinguish between LPG used as motor fuel and LPG used for heating. Also in this case the additional information used comes from IEA energy balances: in IEA data (IEA, 2012a) there is a final consumption flow named “road” that records fuels used in road vehicles. For LPG, as for gas oil and petrol, this flow has been split and allocated to all NACE sectors and private consumption in WIOD. Following the same procedure, explained in Genty et al. (2012), it is possible to desegregate, for each WIOD sector, the share of

[18] The same tax rates are applied to heating use and to industrial use of energy products. For simplicity in the text we refer to heating use, although data refer to both categories.
[19] The reason for using IEA data is that the WIOD EA has been compiled mainly using IEA data.
[20] The products classified in the “Other petroeum products” category are LPG, bitumen, ethane, lubricants, non-specified oil products, other kerosene, paraffin waxes, petroleum coke, refinery gas, white spirit.

LPG classified in IEA as “road”, and consider this component as LPG used as motor fuel, while the remaining share of LPG is considered as used for heating. This transformation requires additional information from IEA prices (IEA, 2012b) and from the database Odyssee (Odyssee Mure, 2012).

Finally, the different WIOD products “coal” and “coke” are aggregated in a single product as in the ETD. Table 1 summarizes the correspondences between ETD and WIOD products and the transformation needed. The nine uses of energy products finally analysed are gasoline (motor fuel), diesel (motor fuel), LFO, LPG (motor fuel), LPG (heating), natural gas (heating), HFO (heating), coal and coke (heating), and electricity.

The last transformation needed is the conversion of WIOD energy data in units coherent with the ETD: in the ETD rates on different products are expressed in euro related to different volumetric measures[21]. On the other hand, WIOD energy use tables are expressed in their energy content (TJ). They have indeed to be conveniently transformed with the ETD[22]. Table 2 shows the conversion factors used for each energy product.

Table 1. Correspondence between ETD and WIOD energy products classification

ETD product	WIOD product	Transformation
Petrol (motor fuel)	Gasoline	None
Gas oil (motor fuel)	Diesel	None
Gas oil (heating)	Light fuel oil-LFO	None
Kerosene (motor fuel)	Jetfuel	Excluded
Kerosene (heating)	Other kerosene	Excluded
LPG (motor fuel)	Other petroleum products	Desegregated
LPG (heating)	Other petroleum products	Desegregated
Natural gas (motor fuel)	Natural gas	None
Natural gas (heating)	Natural gas	Excluded
Heavy fuel oil-HFO (heating)	Heavy fuel oil-HFO	None
Coal and coke	Coal	Aggregated
Coal and coke	Coke	Aggregated
Electricity	Electricity	None

Source: own elaboration.

[21] In particular: rates on petrol, gas oil and kerosene are expressed in euro per 1000 litres, rates on LPG are expressed in euro per 1000 kilograms, rates on natural gas, coal and coke are expressed in euro per gigajoule.

[22] The European Commission makes available conversion factors for each energy product (documentation ancillary to the Commission proposal (European Commission 2001a) available at: http://ec.europa.eu/taxation_customs/resources/documents/taxation/presentation_energy_en.pdf)

Table 2. Conversion factors

WIOD Energy Product	WIOD Units	ETD Units	Net Calorific Value (NCV); Density (D) Conversion factor (CF)	Transformation from WIOD to ETD Units
Gasoline (motor fuel)	TJ	1000 kg	CF=NCV (GJ/1000 kg)= 46	Data in 1000 kg=TJ x 1000/46
Diesel (motor fuel)	TJ	1000 l	NCV (GJ/1000 kg)=42.3; D (Kg/m^3)=832 CF=NCV x D/1000=32.8	Data in 1000 l=TJ x 1000/32.8
LFO (heating)	TJ	1000 l	NCV (GJ/1000 kg)=42.3; D (Kg/m^3)=832 CF=NCV x D/1000=32.8	Data in 1000 l=TJ x 1000/32.8
LPG (motor fuel)	TJ	1000 kg	CF=NCV (GJ/1000 kg)= 46	Data in 1000 kg=TJ x 1000/46
LPG (heating)	TJ	1000 kg	CF=NCV (GJ/1000 kg)= 46	Data in 1000 kg=TJ x 1000/46
Natural gas (heating)	TJ	GJ		Data in GJ=TJ x 1000
Heavy fuel oil-HFO	TJ	1000 kg	CF=NCV (GJ/1000 kg)= 40	Data in 1000 kg=TJ x 1000/40
Coal-coke	TJ	GJ		Data in GJ=TJ x 1000
Electricity	TJ	MWh	CF=NCV (GJ/MWh)= 3.6	Data in MWh= TJ x 1000/3.6

Source: own elaboration.

4.2.2. Tax variation compiling

As regards tax variation, a matrix containing the variation in rates is filled in, considering in column the nine energy products analysed, and in row 35 sectors for 41 countries. The variation is assumed to be equal to zero for all the non-European countries. Moreover, as for European countries, when the new minima proposed is lower than the present rate no change in taxation is assumed; this seems to be a realistic assumption: if a country is already charging rates higher than the current minima proposed, there would be no reason for the proposal to cause a decrease in present rates. Anyway, this assumption could be changed in order to see what happens if countries decided to lower the fiscal pressure at the minimum level required by the directive.

The tax rates variation comes from the novelties contained in the proposal. First, the reform would cause an increase in the tax rates in force at present when the minima rates fixed are higher than the present rates. Appendix 3, table A, compares the current minima rates established by the European Council (2003) and the minima rates proposed by the European Commission (2011a).

The second main goal of the reform is to create a price signal coherent with the ETS: this implies particular treatments for some sectors that result in different tax rate variations as follows. The main change introduced is to split the tax into two components, the component related to emissions and the component related to the energy content (Appendix 3, table B shows the new tax rates split into two components). For sectors already belonging to ETS, they are exempted from the component related to CO_2 emissions. Appendix 3, table C lists the sectors covered by the ETS. Moreover, for two of these sectors (sectors "Electricity, gas and water supply" and "Air transport") also an exemption for the energy content component is applied, so that the tax variation is equal to zero. On the other hand, the increase in taxation is greater for some sectors because the reform tries to reduce favoured treatments. In particular, the tax variation would be higher for agriculture and water transport, because of the elimination of previous exemptions for the energy tax component related to emissions. Moreover, the reform also eliminates the favoured treatment for the commercial use of diesel: its enforcement would therefore cause a greater tax variation for the sector "inland transport".

Table 3 summarizes new rates applied to specific sectors.

Table 3. New minima rates applied to specific sectors

WIOD code	WIOD sector	New minima applied (for all energy product)
AtB	Agriculture, Hunting, Forestry and Fishing	Component related to CO^2 emissions
21t22	Pulp, Paper, Paper , Printing and Publishing	Component related to energy content
23	Coke, Refined Petroleum and Nuclear Fuel	Component related to energy content
27t28	Basic Metals and Fabricated Metal	Component related to energy content
E	Electricity, Gas and Water Supply	Zero
60	Inland Transport	Component related to CO^2 emissions (only for gas oil)
61	Water Transport	Component related to CO^2 emissions
62	Air Transport	Zero

Source: own elaboration.

5. EMPIRICAL ANALYSIS

The following section describes the results of the simulation applied for data referred to 2008[23] for all the 27 European countries. First, the analysis shows the variation in prices caused by the reform, considering each energy product separately. Then the total effect on prices is shown. Appendix 4 shows the results of the analysis for those sectors where the total price variation is greater than 1%. The main result that the analysis reveals is that, in general, the reform would not affect prices strongly.

[23] The year 2008 has been chosen for two main reasons. First, it is one of the last years available in data. Second, for 2008 we dispose of data on energy use, referred to Italy, desegregated depending on the purpose of the energy products use. This permits a check of the transformations applied to the WIOD EA.

For some energy products, in particular gasoline, LPG and electricity, the reform would leave prices almost unchanged. For gasoline and electricity, the main reason is that generally countries are charging rates that are already higher than the present minima rates required under the ETD, so that the reform would not actually cause an increase in tax rates. As regards LPG, the quantity consumed is low compared with other energy products, and this explains why the higher rates proposed for LPG would not affect prices significantly.

Table 4. Effect of the proposed minima tax rates on price (percentage variation)

Sector	Country	Main energy product price variation	Total price variation
Inland Transport	BEL	4.33 (Diesel)	4.34
	BGR	1.79 (Diesel)	2.15
	CYP	2.65 (Diesel)	2.65
	ESP	3.49 (Diesel)	3.50
	EST	2.01 (Diesel)	2.01
	FIN	1.48 (Diesel)	1.48
	FRA	2.59 (Diesel)	2.59
	GBR	1.10 (Diesel)	1.10
	IRL	1.70 (Diesel)	1.70
	ITA	1.41 (Diesel)	1.43
	LUX	3.29 (Diesel)	3.31
	LVA	2.47 (Diesel)	2.58
	POL	1.10 (Diesel)	1.14
	PRT	5.85 (Diesel)	5.85
	ROM	1.01 (Diesel)	1.02
Water Transport	CYP	1.62 (Lfo)	2.06
	ESP	1.76 (Lfo)	1.92
	GBR	1.42 (Lfo)	1.53
	LTU	1.71 (Lfo)	2.21
	LVA	3.13 (Lfo)	3.14
	MLT	0.83 (Lfo)	1.18
	PRT	1.02 (Lfo)	1.25
	ROM	1.00 (Lfo)	1.07
Chemicals	ROM	1.15 (Natgas)	1.32
Other Non-Metallic Mineral	BGR	0.55 (Natgas)	1.15
	EST	1.68 (Natgas)	1.78
Mining and Quarrying	CZE	1.69 (Coal Coke)	1.72
	DEU	1.10 (Coal Coke)	1.12
	ROM	0.87 (Coal Coke)	1.12
	SVK	0.89 (Coal Coke)	1.07

Source: own elaboration.

As regards the other energy products considered (diesel, LFO, natural gas, HFO, coal and coke) few sectors would see an increase in prices greater than 1%. The most affected sector would be “Inland transport”. In 6 European countries (Finland, Ireland, Italy, Poland, Romania, UK) the final price of this sector would increase between 1 and 2%; in 6 countries (Bulgaria, Cyprus, Estonia, France, Latvia, Sweden) the price increase would be between 2 and 3%. and in Belgium, Luxemburg, Portugal and Spain greater then

3%. This increase in prices would be mainly due to the stronger taxation of diesel and to the elimination of the favoured treatment of their commercial use. Another sector where prices would increase is " water transport", in particular for Cyprus, Ireland, Latvia, Lithuania, Malta, Netherland, Portugal, Romania, Spain, UK. In this case the main change affecting prices would be the increase in taxation for LFO and HFO, largely used by this sector. Finally, prices would lightly change also for "chemicals and chemical products", "other non-metallic minerals", and "mining and quarrying", mainly due to the increased tax rates applied to natural gas, coal and coke.

In conclusion, only few Europeans countries would not be affected (for Austria, Denmark, Greece, Hungary, Slovenia prices variation is near zero) the main result is that the reform would cause only light increases in prices, except for the "inland transport" sector where, even so, price variation never exceeds the 5%. Table 4 shows the results described so far.

6. FINAL REMARKS

The work is focused on European Energy Taxation Directive (ETD), the environmental taxation applied to energy products used by industrial sectors and by households. In 2011, the European Commission proposes a new version of the ETD (European Commission, 2011a). The aim of the new proposal is to promote energy efficiency and consumption of more environmentally friendly products. The target is also to coordinate the environmental taxation with the Emission Trading Mechanism (ETS), the other market mechanism introduced by the Community in 2005, to establish a comprehensive and consistent CO_2 price signal beyond the EU ETS.

The aim of this work is to analyse the effect that the ETD reform would have if implemented, in particular on the level of prices in the European countries. The framework chosen is the input output analysis, a useful instrument because it can take into account not only the direct effect of changes in the taxation rates, but also the indirect effect caused by increases in the price of inputs. The main finding is that the new energy tax regime will have a really low impact on prices. Since prices are not strongly affected by the reform, there will be no problem for competitiveness and distributional implication. On the other hand this will imply a low capability of this reform to improve consumption and production in terms of environmental pressures.

The result suggests further possible analyses. One possible extension could be to analyse the effects of energy taxation on the basis of different policy scenarios: for example, considering today's important problems in economic recovery it is realistic to assume that the European countries that are applying a tax system harder than the minimum rates required by the Community may decide to reduce the tax burden. A second possible extension could focus on the "inland transport" sector. The proposal was blocked by the Parliament due to worries related to the effect of the increased taxation in terms of competition, and actually the reform would lead to a price increase for the transport sector. However, the analysis reveals that the price increase would be slight. Furthermore, the reform aims at influencing the pattern of production and consumption, also through a change in prices. It would be interesting to include in the analysis the possibility of substitution among production inputs and see what change in prices (and therefore what level of taxation) creates an incentive to use alternative fuels.

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Appendices

Appendix 1. Counties considered

European Countries	Denmark	Ireland	Poland	UK	Indonesia	Taiwan
	Estonia	Italy	Portugal	**Non-European Countries**	India	United States
Austria	Finland	Latvia	Romania		Japan	Rest of the World
Belgium	France	Lithuania	Slovak Republic	Australia	Korea	
Bulgaria	Germany	Luxemburg	Slovenia	Brazil	Mexico	
Cyprus	Greece	Malta	Spain	Canada	Russia	
Czech Republic	Hungary	Netherland	Sweden	China	Turkey	

Source: own elaboration.

Appendix 2. Sectors considered

Sector number	WIOD code	Sector	Sector number	WIOD code	Sector
1	AtB	Agriculture, Hunting, Forestry and Fishing	19	50	Sale, Maintenance and Repair of Motor Vehicles
2	C	Mining and Quarrying	20	51	Wholesale Trade and Commission TraDE
3	15t16	Food, Beverages and Tobacco	21	52	Retail Trade, Except of Motor Vehicles and Motorcycles
4	17t18	Textiles and Textile Products	22	H	Hotels and Restaurants
5	19	Leather, Leather and Footwear	23	60	Inland Transport
6	20	Wood and Products of Wood and Cork	24	61	Water Transport
7	21t22	Pulp, Paper, Paper , Printing and Publishing	25	62	Air Transport
8	23	Coke, Refined Petroleum and Nuclear Fuel	26	63	Other Supporting and Auxiliary Transport Activities
9	24	Chemicals and Chemical Products	27	64	Post and Telecommunications
10	25	Rubber and Plastics	28	J	Financial Intermediation
11	26	Other Non-Metallic Mineral	29	70	Real Estate Activities
12	27t28	Basic Metals and Fabricated Metal	30	71t74	Renting of M&Eq and Other Business Activities
13	29	Machinery, Nec	31	L	Public Admin and Defence; Compulsory Social Security
14	30t33	Electrical and Optical Equipment	32	M	Education
15	34t35	Transport Equipment	33	N	Health and Social Work
16	36t37	Manufacturing, Nec; Recycling	34	O	Other Community, Social and Personal Services
17	E	Electricity, Gas and Water Supply	35	P	Private Households with Employed Persons
18	F	Construction			

Source: own elaboration.

Appendix 3. Actual and proposed environmental tax regimes

Table A) Comparison between the current minima rates established by the European Council (2003) and the minima rates proposed by the Commission (EC, 2011)

Motor fuels	Current minima	Minima proposed in ETD reform
Petrol (€ per 1000 l)	**359**	**360**
Gas oil (€ per 1000 l)	**330**	**390**
Kerosene (€ per 1000 l)	**330**	**392**
LPG (€ per 1000 kg)	**125**	**500**
Natural gas (€ per GJ)	**2.6**	**10.7**
Heating fuels and motor fuels for industrial use		
Gas oil (€ per 1000 l)	**21**	**57.37**
Heavy fuel oil (€ per 1000 kg)	**15**	**67.84**
Kerosene (€ per 1000 l)	**0**	**56.27**
LPG (€ per 1000 kg)	**0**	**64.86**
Natural gas (€ per GJ)	**0.15**	**1.27**
Coal and coke (€ per GJ)	**0.15**	**2.04**
Electricity *(€ per MWh)*	**0.5**	**0.54**

Source: European Commission, 2011a.

Table B) New minima rates split in two components

Motor fuels	Component related to energy content	Component related to CO_2 emissions	Minima proposed in the ETD reform
	(a)	(b)	(a)+(b)
Petrol (€ per 1000 l)	314	46	360
Gas oil (€ per 1000 l)	337.9	52.1	390
LPG (€ per 1000 kg)	442	58	500
Heating fuels and motor fuels for industrial use			
Gas oil (€ per 1000 l)	5.28	52.1	57.37
Heavy fuel oil (€ per 1000 kg)	61.84	6	67.84
LPG (€ per 1000 kg)	6.9	58	64.86
Natural gas (€ per GJ)	0.15	1.12	1.27
Coal and coke (€ per GJ)	0.15	1.89	2.04

Source: European Commission, 2011a.

Table C) Sectors subject to the ETS

Activities (European Parliament and Council, 2003)	WIOD sector
Energy activities	
Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations)	Electricity, Gas and Water Supply
Mineral oil refineries	Coke, Refined Petroleum and Nuclear Fuel
Coke ovens	
Production and processing of ferrous metals	Basic Metals and Fabricated Metal
Metal ore (including sulphide ore) roasting or sintering installations	
Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2,5 tonnes per hour	
Mineral industry	
Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day	
Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day	
Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m3 and with a setting density per kiln exceeding 300 kg/m3	
Other activities	Pulp, Paper, Paper , Printing and Publishing
Industrial plants for the production of	
(a) pulp from timber or other fibrous materials	
(b) paper and board with a production capacity exceeding 20 tonnes per day	
Aviation[*]	Air Transport
Flights which depart from or arrive in an aerodrome situated in the territory of a Member State to which the Treaty applies.	

[*] European Parliament and Council, 2008.

Source: own elaboration.

Appendix 4. Simulations results

Effect of increased rates on prices (percentage variations)

Country	Sector	Gasoline	Diesel	LFO	LPG motor	LPG heating	Natgas	HFO	CoalCoke	Electr	Tot
BEL	Inland Transport	0.00	4.33	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.34
BGR	Other Non-Metallic Mineral	0.00	0.00	0.01	0.04	0.02	0.55	0.02	0.51	0.00	1.15
BGR	Inland Transport	0.00	1.79	0.03	0.00	0.00	0.33	0.00	0.00	0.00	2.15
CYP	Inland Transport	0.00	2.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65
CYP	Water Transport	0.00	0.00	1.62	0.00	0.01	0.00	0.44	0.00	0.00	2.06
CZE	Mining and Quarrying	0.00	0.00	0.00	0.00	0.00	0.02	0.01	1.69	0.00	1.72
DEU	Mining and Quarrying	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.10	0.00	1.12
ESP	Inland Transport	0.00	3.49	0.00	0.00	0.00	0.01	0.00	0.00	0.00	3.50
ESP	Water Transport	0.00	0.00	1.76	0.00	0.00	0.00	0.16	0.00	0.00	1.92
EST	Other Non-Metallic Mineral	0.00	0.00	0.00	0.00	0.00	0.08	0.01	1.68	0.00	1.78
EST	Inland Transport	0.00	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01
FIN	Inland Transport	0.00	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48
FRA	Inland Transport	0.00	2.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.59
GBR	Inland Transport	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10
GBR	Water Transport	0.00	0.00	1.42	0.00	0.00	0.00	0.10	0.00	0.00	1.53
IRL	Inland Transport	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
ITA	Inland Transport	0.00	1.41	0.00	0.00	0.00	0.02	0.00	0.00	0.00	1.43
LTU	Water Transport	0.00	0.00	1.71	0.00	0.01	0.00	0.49	0.00	0.00	2.21
LUX	Inland Transport	0.00	3.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.31
LVA	Inland Transport	0.00	2.47	0.11	0.00	0.00	0.00	0.00	0.00	0.00	2.58
LVA	Water Transport	0.00	0.00	3.13	0.00	0.00	0.00	0.00	0.00	0.00	3.14
MLT	Water Transport	0.00	0.00	0.83	0.00	0.00	0.00	0.34	0.00	0.00	1.18
POL	Inland Transport	0.00	1.10	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1.14
PRT	Inland Transport	0.00	5.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.85
PRT	Water Transport	0.00	0.00	1.02	0.00	0.00	0.00	0.22	0.00	0.00	1.25
ROM	Mining and Quarrying	0.00	0.02	0.00	0.00	0.00	0.21	0.01	0.87	0.00	1.12
ROM	Chemicals	0.00	0.01	0.00	0.00	0.00	1.15	0.00	0.16	0.00	1.32
ROM	Inland Transport	0.00	1.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.02
ROM	Water Transport	0.00	0.00	1.00	0.00	0.08	0.00	0.00	0.00	0.00	1.07
SVK	Mining and Quarrying	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.89	0.00	1.07