

Assessing the effects of a value added tax policy on the wine sectors

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Abstract

International competition in wine markets has granted the agricultural sector and regional development of several Italian areas through new wine producers' strategies that has become more quality oriented. In this respect, Italian wines are of many different types for which the demand increases more than proportionally as income rises and the elasticity of substitution among the different types of wine is not zero and depends on several factors. In this respect, the paper aims to analyse the interindustry interactions between wine products within the production system in order to evaluate if the change in the agriculture Value Added Tax (VAT) can generate a set of effects on composition and quality of wine production. Focusing the analysis on a central area of Italian territory (the region called Marche) the paper organises the statistic data in a bi-regional Social Accounting Matrix (Marche - Rest of the Italy) in order to build a CGE model. This is the suitable tool to manage the variable of the elasticity of substitution between wine product and the prices of other types of wine.

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Keywords: Wine sectors, Fiscal reform, SAM, CGE.

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1 Introduction

The scheme of the Italian taxation concerning the Value Added Tax (VAT) is characterized by two types of rule (IPSOA, 2008): the Special Regime (SR) and the Ordinary Regime (OR). The Special Regime is applied indirectly through the detection of special requirements. One of the prerequisites for admission to SR is the production of a set of goods determined by the law among which the wine produced by agriculture. Opting for the Special Regime, the wine producers can take advantage of a special procedure in determining the allowances to be applied in the determination of the tax debt, which is calculated applying a set of special tax rates established by the Ministry of the Economy.

Such taxation differs according to the typology and the volume of business of taxpayer. The SR is applied if the subjective condition - the kind of the producer - or the objective condition - the type of products that are included in a particular list without considering the juridical form of the subject that is submitted to such regime - exists. In particular, this regime can be applied both to individual or to company subject.

The main feature of SR is the method used to determine the tax amount: the same taxation rates of OR are applied on sales of output while, as for input purchases, their amount is put equal to output and the rates are those indicated in an appropriate ministerial table. The SR in agriculture is not compulsory and the agriculture producer can renounce to it applying OR.

Such waiver is convenient when the producer has a tax credit and asks for reimbursement since SR does not allow reimbursements. The VAT allowance on purchases (art. 34, Dpr 633/72) in the case of SR applied in agriculture, independently from the sales volume and unless OR option, provides for the determination of a lump sum equal to the amount determined applying the compensation rates determined by the Ministry to the taxable base of agricultural output sales. The difference between the ordinary rate and compensation rates represents the taxation rate of the producer. The “ministry” rate provides for a compensation rate for wine equal to 12,5 per cent for all wines except for those defined as “liqueur-like” and alcoholic, with alcoholic volume greater than 22 per cent.

The possibility to apply a special procedure to determine such tax causes distortions in the entire economic system. Thus, it is necessary to verify which would be the general equilibrium effects of the SR abolition. The analysis of such a policy can be made through a computable general equilibrium model (Piggot and Whalley, 1985). The model will be implemented on a numerical basis, denominated Flow Table (TFL) (Fossati, 1991), taken out from a SAM (Social Accounting Matrix) for the Marche region (Ciaschini and Socci, 2003). Since the matrix has to

present a greater degree of detail for wine goods, we need to isolate agricultural from manufacturing producers and then using the production classification based on Nace.Rev.1., we will identify a variety of wine producers that we can identify as wine industries. The classification distinguishes between agriculture and manufacturing producers on the basis of grapes utilized in the production of wine. In the case where own grapes are used, wine is considered as an agricultural product while if purchased wine is used the product will be considered a manufacturing one. Moreover a further distinction will be made within the two categories between white wine and red wine producers.

For this purpose, in the following part we will describe the calculation needed in order to build a numerical base for the evaluation of a VAT policy.

2 From the social accounting matrix to the flow table

In order to implement the CGE model we need to manage the bi regional SAM scheme for Marche for the 1996 that provides the preliminar data base (Socci, 2004). Starting from this structure some data are taken as correct and others are adjusted to be consistent in the process fo generating the benchmark data set (Shoven and Whalley, 1984). Therefore it is useful to provide a different data arrangement in order to obtain more details on wine production and to determine the VAT flows that can be defined the flow table (TFL).

The TFL in figure 1 is the result of this disaggregation procedure and it represents the right and proper numerical base for the computational model. The TFL maintains the bi-regional and multi-sector structure of the SAM, but there is no symmetry between rows' and columns' holder (Gorla and Senn, 1991). Actually rows refer to markets and columns to operators and the flows are registered with positive or negative signs. To be more precise, incoming flows are negative and outgoings positive, therefore the total of rows and columns is zero. This condition let the implementation of the model being more immediate because it express numerically the market clearing and zero profit assumption².

²All the data needed for the transformation of the SAM in TFL scheme are collected by the Istat (ISTAT, 2008)

Figure 1: The flow table (TFL) for the CGE model (million of lira)

	Agricol	WVA	RWA	indus	machine	WVI	services	FK	D, J	C, I	D, II	C, II	D, III	C, III	D, IV	C, IV	D, V	C, V	D, IMP	C, IMP	GT	PA	RDI	RDM	
Agricol	-668367	25387	16850	1518009	2656	49016	33704	79585	0	0	42821	0	91164	0	259536	0	161853	0	13111	0	0	0	0	-4288657	106218
WVA	73	-342098	0	1153	0	0	96224	0	0	6961	0	14892	0	42402	0	26360	0	2134	0	0	0	0	0	151657	238
RWA	48	-228127	768	0	2	0	64165	0	0	4644	0	9933	0	28278	0	17581	0	1424	0	0	0	0	0	101137	146
indus	727739	61557	31894	-5,9E+07	2687759	95237	25981	8429862	7029886	822431	0	2056595	0	7427058	0	4030238	0	249803	0	0	0	0	0	15,44833	5585352
machine	37108	2383	1059	2540331	-1,5319853	1913	1294	984220	6248875	31459	0	246546	0	1652316	0	672050	0	8199	0	0	0	0	0	0	2910500
WVI	90	4	0	1410	0	0	8506	0	0	8506	0	18200	0	51823	0	32216	0	2608	0	0	0	0	0	165354	298
services	396951	25493	11324	6120193	2236863	31163	13945	445381028	0	1501482	0	3214286	0	9165165	0	5690854	0	460411	0	8530524	0	0	0	69,08233	1075241
FD	2605100	2942	1962	0	0	3895	2398	533425	-1,3E+07	-541762	0	356528	0	1472335	0	4525942	0	1039508	0	2725605	0	0	0	3109131	-1861792
LD	19,9001	28665	19116	5053311	944628	26556	15111	9142891	0	-104170	0	-1567645	0	-8,11635	0	-54,69558	0	-284410	0	0	0	0	0	0	116539
LA	477728	84757	56519	1639276	153464	4841	3300	3465625	0	-300277	0	-359627	0	-2077141	0	-2,697023	0	-450462	0	0	0	0	0	0	0
Otherinc	557899	98980	68004	5468111	518081	16159	11016	12634688	0	-217960	0	-349922	0	-2,367306	0	-2,988658	0	-970381	0	-1,2E+07	0	0	0	0	0
C, I	0	0	0	0	0	0	0	0	0	2866402	-2866402	0	0	0	0	0	0	0	0	0	0	0	0	0	
C, II	0	0	0	0	0	0	0	0	0	6547183	-6547183	0	0	0	0	0	0	0	0	0	0	0	0	0	
C, III	0	0	0	0	0	0	0	0	0	23209581	-23209581	0	0	0	0	0	0	0	0	0	0	0	0	0	
C, IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
C, V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TRF	0	0	0	0	0	0	0	0	0	-1702323	0	-3911461	0	-1,0653499	0	-6713829	0	-857486	0	9337435	0	0	0	0	0
TRI	0	0	0	0	0	0	0	0	0	40468	0	158943	0	553296	0	380463	0	12340	-1,2E+07	3637352	0	5720393	0	1791198	
C, IMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24423733	-24423733	0	0	0	0	
GT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VA, Gs	22382	5672	3792	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VA, Ls	-19942	-5054	-3379	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VA, Ld	9971	2527	1689	17479490	1544235	76	51	16293106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VA, Lc	-11191	-2836	-1896	-1,8E+07	-1,4312397	-170	-114	-14634331	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
IN	-259095	-31041	-20700	3093556	6799	201378	137286	66988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CS	149627	25386	16928	1667019	275963	7822	4587	3141008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BRAP	22311	3785	2524	220041	36109	1032	605	414603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AI	934	-8	-8	1082	-9	-8	-8	-8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
IM	44258	336	606	263707	149122	373	673	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
RDM	589125	4226	7630	6995278	2669506	1471	2862	1773271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
RDI	1177391	8934	16113	18692941	5548364	14655	26430	2719773	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Referring to the TFL columns, the operators are distinguished between 4 industries related to wine products³, 4 industries related to other products⁴, 7 institutional sectors, capital formation, Rest of Italy, Rest of the World. Wine producers are separated according to wine colour and source of grapes, so in the table there are two activities that produce respectively white and red wine from own grapes (WWA e RWA) and other two industries that produce white and red wine from purchased grapes (WWI e RWI).

The markets are represented by the rows of the TFL and they refers to the output generation (the 8 industries) and the value added distribution, or alternatively, primary factor market. Value added in fact is distinguished among wages and salaries (dependent employee incomes) (LD), self employee incomes (LA), other incomes (OtherInc.) and indirect taxes (IIN). Payroll taxes (CS), embodied in LD and LA, and have been taken out and registered in a separate row because actually they represent an incoming flow for the Government, while LD and LA remunerations are immediately assigned to private households. Afterwards, in the phase of secondary income distribution, the government will finally transfer payroll taxes revenue to households as pensions. From the aggregate IIN the values VAT has been taken out in order to show the formation of deductible and non-deductible tax. In the table the agricultural producers which have opted for the SR (s) are distinguished to those who have chosen the OR. In both cases the debt VAT (d) and the credit VAT (c) are separated. The table is evaluated in producers' prices which include VAT.

Once the production and the value added flows have been calculated and arranged according to the computational model, the rest of the table shows the income circular flow for the whole region. The institutional sectors are represented by 5 subsector for households ranged in income classes, one representative sector for enterprises (C_Imp) and central government (PA). Each sector is represented by a column for initial endowments (D) and a column for final consumers (C). Initial endowments for households are given by incomes and transfers (TrF and TrI). It can be interpreted as the consumer budget constrain, in fact it represents the limit level of expenditure for the consumer to purchase goods and services.

Government endowments consist on direct taxes revenues (IRAP, ID e AI) and social contributions (CS), which are all registered in separate rows. Government expenditure mostly refers to transfers to private households and enterprises. A column and a row imputed to capital formation (FK), which mean savings (positive or negative) complete the block of secondary income flows. The table closes with columns and rows referring to net lending/borrowing with the rest of Italy (RDI)

³White Wine Agriculture, Red Wine Agriculture, White Wine Industry, Red Wine Industry.

⁴Agriculture, Industry, Machine and Car and Services.

and with the Rest of the World (RDM)⁵.

3 The CGE framework: technical aspects and assumptions

The data base allows implementing the static general equilibrium model. It has a disaggregate representation of 7 industries which produce an homogeneous good; one sector producing investment goods and 5 household consumption sectors ordered by income classes. As an application of Walrasian general equilibrium system (Arrow and Debreu, 1954) it is featured as a system of equations describing production decisions, consumers behaviour, capital accumulation, income constrains and relationship with the rest of the world⁶.

Starting from production functions it is worth to underline that all industries operate in perfect competition on both factors and outputs market. Domestic output can be described as a two stage nested constant-elasticity-of-substitution (CES) production function (Fiorillo and Socci, 2003). In the first stage domestic output in each sector Y_i derives from the combination of intermediate goods and total value added (eq.1).

$$Y_i = \left(V_i^{\frac{\sigma-1}{\sigma}} + B_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \quad (1)$$

where the elasticity of substitution between intermediate consumption B_i and value added V_i is supposed to be zero ($\sigma = 0$).

In the second step, value added per each sector is generated by combining primary factors, labour L_i and capital K_i (eq.2). The elasticity of substitution among them (η_B) is kept equal to zero.

$$V_i = \left(L_i^{\frac{\eta_V-1}{\eta_V}} + K_i^{\frac{\eta_V-1}{\eta_V}} \right)^{\frac{\eta_V}{\eta_V-1}} \quad (2)$$

where the aggregate labour L_i is supposed to be composed by dependent employee LD_i and self employee LA_i (eq.3). The elasticity of substitution (η_L) in this case is supposed to be equal to one.

$$L_i = \left(LD_i^{\frac{\eta_L-1}{\eta_L}} + LA_i^{\frac{\eta_L-1}{\eta_L}} \right)^{\frac{\eta_L}{\eta_L-1}} \quad (3)$$

⁵The flows from and to the Rest of the World are net of import taxes.

⁶The presentation of various function follows the layout of module MPSGE for GAMS that divides the system in various blocks. The blocks are those of production, that of interregional commerce, the households demands, and government demand.

In the same way intermediate goods are combined considering an elasticity of substitution (η_B) equal to zero among all outputs except wine products (eq.4).

$$B_i = \left(\sum_j X_{ji}^{\frac{\eta_B-1}{\eta_B}} \right)^{\frac{\eta_B}{\eta_B-1}} \quad (4)$$

where X_{ji} represent the intermediate good j used for the production of i good.

As to intermediate and final demand, elasticity of substitution among wine of the same colour is higher (100) with respect to wine of different colour (40).

Special attention must be directed at this point to the taxation: VAT and net indirect taxes are calculated on the output price while the actual social benefits and IRAP, that is a regional tax, are determined on the factors' price.

Total industry output value O_i is finally determined adding the value of imports (M_i) to the domestic output value (Y_i), according to the Armington's hypothesis (1969) of non perfect substitution between domestic and imported goods (eq.5).

$$O_i = \left(Y_i^{\frac{\eta_{i,e}-1}{\eta_{i,e}}} + M_i^{\frac{\eta_{i,e}-1}{\eta_{i,e}}} \right)^{\frac{\eta_{i,e}}{\eta_{i,e}-1}} \quad (5)$$

With reference to wine output, the elasticity of substitution between domestic output and imports for the Rest of Italy ($\eta_i=100$) is supposed to be higher than the elasticity between domestic output and the Rest of the World ($\eta_e=10$).

Regarding the welfare levels, the 5 households classes show a demand for the 7 industries, future consumption (savings) and decide the transfers amounts to firms and households. The households endowments are given by labour compensation, untaxed capital incomes of companies⁷, transfers from other sectors and external balance. From the model implementation perspective in fact, the consumers' utility function is treated as if it was a production function of a composite good wealth whose inputs are private consumptions, savings and transfers. Such composite good is purchased using endowments. A similar procedure has been followed to define the behavioural functions of firms as to savings distributes dividends and taxes. Incomes of firms are given by capital incomes and transfers; these incomes constitute profits which are split into non distributed profits, transfers to households and transfers to other firms (dividends). On these profits firms pay a tax called IRPEG and other taxes⁸.

⁷In National accounts small firms are included in the households sector.

⁸The firm sector is given by financial and non financial firms, that is companies (public and private), quasi-corporation, credit institution and insurances. Also in this case firms are seen as consumers of a composite good "profit" (V) generated by savings and distributed dividends, this composite good is purchased using capitals and transfers received as endowments.

Savings follow a kaldorian hypothesis according which, households have a lower saving propensity than firms and consume a share of their income; firms do not consume and either save or distribute dividends.

Government expenditure is given by collective consumption and transfers to households and firms. It is financed through taxes, operating surplus of government, public savings and transfers, including the Rest of the World. Referring to VAT, the tax debit and credit calculated both in SR and in OR have been considered separately. The model is solved for relative prices and quantities, the price index has been chosen as numeraire so that all changes can be interpreted as real changes.

4 Simulation results and conclusion

The results obtained under the scenario of a change of the VAT system focused on the impact of the abolition of SR at national level both on the major economic indicators and on those tied to wine production. The model has been calibrated on the flow table and the simulation has been performed as a percent changes with respect to the benchmark given by the economy represented in the SAM. It is a common use in all CGE models that all data in the benchmark are valued by a unit price vector (Kehoe and Kehoe, 1994). The general equilibrium solutions are then compared with the benchmark values⁹.

The simulation is based on the scenario characterized by the abolition of the special VAT regime for agriculture producers. In Table 1 we can observe the effects on the most relevant economic aggregates considered in the model given in percent changes from the benchmark values. Under the simulated scenario, the demand made by the five households sectors¹⁰ (C) for “agriculture produced” wine exhibits a slow down, both for “agriculture produced” white wine (WWA) and “agriculture produced” red wine (RWA). This effect can be due to the increase in prices of the red and white wine (P) which determines a price change and a subsequent substitution effect. Moreover, a slow down in total output is also observed in the correspondent activities (Q). The abolition of the SR is assumed also in the rest of the Italy where higher tax rates imply higher price changes. We then observe import reductions of “agriculture produced” wine both from the

⁹Since we are determining a walrasian general economic equilibrium, market clearing conditions are represented by the zero profits and income constraints condition (zero column sums). In the case of the benchmark the conditions are fulfilled since the row sums of SAM must be zero. Moreover, we keep account of the behaviour of the agents according the description given in the previous section by means of the demand and the production functions.

¹⁰Consumers are classified according to income.

Table 1: The Effects on main aggregates in different scenarios

	Agriculture	WWA	RWA	Industry	Machine	WWI	RWI	Services
C_I	0,07%	-56,50%	-59,30%	0,07%	0,07%	45,80%	48,10%	0,07%
C_II	0,10%	-56,50%	-59,30%	0,10%	0,10%	45,90%	48,20%	0,10%
C_III	0,09%	-56,50%	-59,30%	0,09%	0,09%	45,80%	48,10%	0,09%
C_IV	0,03%	-56,50%	-59,40%	0,03%	0,03%	45,70%	48,00%	0,03%
C_V	-0,02%	-56,50%	-59,40%	-0,02%	-0,02%	45,60%	47,90%	-0,02%
PI	0,40%	1,30%	1,40%	0,02%	0,02%	0,10%	0,10%	-0,01%
QI	-0,08%	-14,30%	-12,50%	0,07%	0,06%	12,10%	12,00%	0,10%
MRDI	-0,40%	-77,00%	-74,50%	0,04%	0,05%	21,00%	22,80%	0,05%
MRDM	0,20%	-4,90%	-4,90%	-0,01%	-0,01%	12,60%	13,30%	0,02%
Q	-0,10%	-15,80%	-16,70%	0,05%	0,04%	12,40%	13,00%	0,10%
P	0,40%	1,30%	1,40%	0,03%	0,04%	0,10%	0,10%	0,00%

rest of Italy and, to a smaller extent, from the Rest of the World. Regarding “manufacture produced” wine an opposite sign effect can be observed because of the substitution effect. Final demand for “manufacture produced” white and red wine (WWI and RWI) grows while an import increase is observed, import “manufactured wine” coming from the Rest of Italy grows more than the one of the Rest of the World.

The special italian VAT law that allows producers in agriculture sectors to adopt the SR for the determination of the VAT debt generates a special fiscal advantage for those producers who have an high sales level and relatively low input costs since the deductible VAT can be determined on the sales. In many cases, wine producers can be considered as manufactures which produce luxury goods, so that this benefit could be hardly justified.

The abolition of the SR or the adoption of a targeting mechanism could be considered convenient in order to identify which type of outputs could benefit from this regime. The adoption of a maximum sales level represents a first step in this direction. The repeated prorogation of the preexisting regulations is in fact allowing advantages also to producers that have a producing organization which can be assimilated to manufactures.

In fact, the simulation experiment shows the quantitative effects of the SR abolition in a general equilibrium framework. The substitution of “agriculture produced” with “manufacture produced” wine is due to the induced price change. Such substitution changes the composition of the Marche wine production and import: in the region of Marche all agricultural wine typologies decrease, the one

produced by the region and the ones produced by the Rest of Italy and the Rest of the World: the highest effect is on the Rest of the Italy import of agricultural wine. On the contrary, all “manufactured wine” typologies increase and the greatest increase is for the Rest of Italy. Since the Marche region is characterised by a wine of top quality level produced by several small agricultural firms, it may lead to a substitution with a lower quality wine coming from other Italian regions.

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