IMPACT ANALYSIS OF THE COMMON AGRICULTURAL POLICY CHANGES IN ITALY: A TWO SECTORS INPUT-OUTPUT AND MICRO-ECONOMETRIC MODELLING APPROACH

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Abstract
International policies of trade liberalization and European Union enlargement have accelerated in a few years the process of reform of the Common Agricultural Policy (CAP). The rapid change on policy has an important impact on performances of farms and enterprises in the agriculture and agri-industry sectors, methods of organizing production and choices of supply.
In this paper the authors would like to investigate the short run reaction of producers to CAP changes and the medium run modification of the industrial structure in Italy. To simulate impact and transformations following to policy changes, a joint micro-econometric modelling and an input-output framework will be applied.

1. Introduction

Policy and markets changes in recent years, following the World Trade Organisation (WTO) agreements, are generating a significant transformation of the environment of producers with economic effects on their performances and their future decisions of production and investment. This prospective is particularly relevant for farms and enterprises operating in Europe, in the agriculture and agri-industry sectors, where the Common Agricultural Policy (CAP) has already moved toward a sharp change and a reduction of contributions for the coming years. With respect to this fast evolution of the state of the economy the available statistical information is not enough to policy makers to take their decisions, due to the lag of time necessary to produce information through surveys and the subsequent delay of official publication of data. Notwithstanding, in Italy, more statistical estimates are nowadays available at the micro-level on the agricultural sector.

Conscious of the limitation of statistical information, the authors propose a micro-macro simulation approach to integrate the available statistical data in a forecasting model and design a possible scenario.

2. The expected changes in the CAP

The mid term review of the CAP, approved by UE in 2003, has sharply changed the agricultural policy in Europe with a revisions of rules and contributions to farmers. New CAP will be oriented to consumers and tax paying people, with a more open agricultural market. The key elements of the reform are related to:

1. the way are paid contributions, not more related to production but to producers;

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2. a greater relationship to rural development and household incomes;
3. necessity to sustain the quality of food, health care and the environment, in a sustainable development prospective.

From 2004 inside the WTO there have been a sequence of agreements to reduce supports to agriculture in EU and on the "modalities" to reach this objective: more open market; reduced subsides to exportations and to producers. At the end of 2006 there should be a final agreement in the WTO.

3. Data available in Italy for simulations on the agricultural sector

Following the EU Regulations on statistics and after introduction of the European System of Accounts (ESA95) the production of micro-data related to elementary economic units (firms, enterprises, farms, households, etc.) has significantly increased. Basic units, such as households, local kind-of-activity (KAU) units and industries, are statistically defined at an international (United Nations and EU) level creating the conditions to consistent integration of data from different sources (Eurostat, 1996).

At the moment, in Italy, micro-data on the agricultural sector are collected on farms, defined as local KAU, by several periodical surveys:

1. General Census of Agriculture, every ten years;
2. Sample Farm Structure Survey, every two years;
3. Sample Farm Business Survey (REA and RICA-REA), yearly from 1998 (Istat, 2004).

These data are available together with annual macro- and sector estimates from National Accounts Statistics. Particularly useful is the National Input-Output table, renewed after SEC95, to consider the interdependency between industries and the national economy with rest of the world.

4. A micro-macro simulation model

Several international institutions (FAO, WFP, EU, USDA, OECD, etc.) have developed their our methodology of simulation and forecasting, emphasising a specific statistical or econometric instrument with respects to the others. Nevertheless a common tendency over years has been the development toward a mix-approach, combining different instruments and data.

Taking account of this evolution on the simulation approach and the new REA data available in Italy, a micro-macro simulation model has been proposed in this paper. The model proposed, taking account of budget constraints and behavioural functions of micro-economic operators (farms and households) allows economic analysis at three levels of aggregation:

1. first economic effects on households income involved on agricultural production after an exogenous shock;
2. subsequent reactions of agricultural producers and of the overall sector;
3. final short-medium run effect on the whole economy.

To simulate the sequence of economic effects and reactions, the model has been divided in three main modules:

1. micro-simulation model of households income involved on agricultural production (accounting module);

2. behavioural model of agricultural producers (econometric module);
3. input-output model to simulate the transmission effect to the rest of the economy (input-output module).

The first module follows the microsimulation literature that study the income-tax effect of policy changes on enterprises and households with models based on accounts and fiscal data (Sutherland, 2001). A main application in Italy has been done to study the money transfers to households, direct taxes and social contributions on employees and retired people (Proto, 1999).
In this paper only households involved on agricultural production has been considered. To better understand the income distribution effects of CAP policy changes to them, they have been classified in typologies that take account of the following characters:

- residence of the farm' holder: North, centre and south;
- household components: one, 2 -3, 4 -5, 6 or more;
- holder sex: male and female;
- economic typology of the holder: only farmer, retired person, off-farm employee, self employed, with capital income.

The total income of households has been calculated as a sum of agricultural and related incomes from farm activities, with off-farm incomes of households components. These households can also benefit from CAP contributions. On this analytical base a series of inequality and relative poverty indicators has been applied to study the effects of policy changes on household income involved in agricultural production.
This module is by construction static, that is there is no consideration of population structure changes over time. Anyway on a short-medium run horizon (one or less than 5 years) this limitation is acceptable. More relevant is the limitation that this kind of models do not consider the reactions of economic agents to policy changes.

To overcome the previous limitation, in the second module the reaction function of agricultural producers to CAP changes has been introduced. An econometric cross-section estimation with REA data has been done of an equation identified with a general to specific approach. The equation relate individual choices of production to a proxy variable of inputs (energy consumption) and main CAP contributions. A dummy variable has been introduce to distinguish large to small farms, that have a statistically significant different economic structure and behavior.
In the same module, the application of the sample estimator of national accounts aggregates from micro-data (weight fixed estimator), allows to calculate the total effect on production of the agricultural sector.

In the third module there is an application of the input-output modeling approach, making use of the symmetric input-output table of the Italian economy, estimated by National Accounts for 2000 year. A two sectors model with the calculation of its reduced form has been the stating point, where an agriculture&agri-industry sector has been distinguished from the rest of the economy. In successive stages the first sector has been subdivided in 4 homogeneous branches (agriculture and animal breeding, forestry, fishing, food and beverages industry) and the total economy in 95 ones following the products and economic activity classification (Nace).
In this module there is the assumption that variations of agricultural production are completely absorbed by final demand (final consumption, gross capital formation and exports) and imports substitution, without any change in market prices. In this way it is possible to verify the overall effect of a variation of agricultural production on the main aggregates of all branches and so the macroeconomic effect of CAP changes.

5. The estimated model and possible scenarios to simulate

To implement the three modules of the simulation model proposed in the previous paragraph for the Italian case a combination of data from Istat has been employed. At the micro level, a data linkage at farm level has been done between information coming from three sources: Census of Agriculture, Sample Farm Structure Survey and Sample Farm Business Survey (REA and RICA-REA). At the macro level, data are from National Accounts. All information relates to 2000 years that is assumed as the starting reference year for the "basic scenario".

In official statistics in 2000 about 2,5 Italian households have a direct management of a farm and so 11.3% of total Italian Households receive directly an income from agricultural activity. Much more households are involved and receive indirectly products and income from this sector, through larger family relationships, proprietorship, profits, rent from land, wages of agricultural employee and income redistribution.

The state of income and its distribution between households involved in agriculture, given the 2000 CAP, is the following:

Tab. 1 - Household income, inequality and poverty indexes. Mean and median values for households typologies (Euro) - year 2000

BASIC SCENARIO	Household income		Inequality indexes		Relative poverty index
	median	mean	Variation coefficient	Gini index	Intensity index (%)
Total	7,113	8,935	3.7	0.36	29.1
Areas					
North Italy	7,991	11,611	4.1	0.35	24.5
Centre Italy	7,210	9,295	3.1	0.32	26.2
South Italy	6,649	7,676	2.8	0.36	30.3
Households components					
Single	7,955	10,282	4.3	0.38	23.5
2 - 3	6,577	8,193	3.0	0.35	25.7
4 - 5	5,877	8,585	1.7	0.34	32.2
6 and more components	8,108	7,750	1.0	0.30	35.8
Holder sex					
Male	7,585	9,585	3.2	0.36	31.4
Female	6,367	7,409	3.4	0.35	22.3
Type of household					
Farmer	4,293	8,771	4.2	0.43	31.2
With capital gains	5,827	17,030	2.9	0.30	30.4
Employee	9,334	9,996	2.6	0.28	22.3
Self employed	8,753	11,486	3.2	0.26	29.6
retired person	7,653	8,239	1.7	0.25	23.8

Source: elaboration on REA survey

The mean and median values of income and the inequality and poverty indexes clearly describe the variability and the economic differences that exist in Italy between the reported households typologies. Income ranges from 4,293 Euros (median value) of an agricultural household (the holder is a farmer), to 9,334 Euros (median value) of a household of an holder that is off-farm employed. Variability of income is lower for households of retired holders and numerous families.

The Ordinary Least Square (OLS) estimation of the reaction function of agricultural producers, in the second module, can be summarised in the following way:

Tab. 2 – Multiple regression summary: reaction function of agricultural producers to CAP changes - Year 2000

Exogenous variables	Coefficient	t statics
Intercept	-34,029.0	-3.0584
Dummy on size[1]	176,773.1	8.4787
Energy	40.8	85.7455
CAP contributions on:		
- cultivations	1.4	9.0172
- income	-3.1	-15.5144
- natural disaster	1.9	1.4891
- biological production	1.9	3.9727
- animal breading	7.5	10.0406

Source: elaboration of REA survey.

Notes:
Dependent variable: agricultural production;
Adjusted R^2 = 0.4628;
OLS coefficients significant at 5% level;
F(7, 11.370)=1,401.2 p<0.0000
Number of observations = 11,378;
[1] Size is measured in terms of agricultural production: more (1) or less (0) 50,000 Euro.

The regression results indicate a statistically significant positive influence of CAP contributions on animal breeding, cultivations (sawed and seed crops) and biological agriculture to agricultural production, but a negative influence of income supports. Significant is also the dimension of farms on production decisions and this characteristic have to be considered in the analysis of production behaviour, taking account of the farm structure in Italy: 80% of the 2,6 million farms have less than 5 hectares of Agricultural Area Utilised (AAU) and only few of them have a national or multinational dimension.

The two sectors input-output table of the Italian economy is the following:

Tab. 3 - Input-output table of the Italian economy, 2 branches, million of euro - Year 2000

Homogeneous branches		Homogeneous branches			Final uses				Total use
		Agriculture, animal breeding, forestry and fishing	Others	Total intermediate use	Final consuption	Gross capital formation	Exports	Total final use	
Cod.	Products of	01, 02, 05, 15	10-14, 16-95						
01, 02, 05, 15	Agriculture, animal breeding, forestry and fishing	46,369	27,678	74,047	65,699	603	15,117	81,419	**155,468**
10-14, 16-95	Others	31,441	995,817	1,027,258	813,648	222,050	285,303	1,321,000	**2,348,258**
Total intermediate consumption		**77,810**	**1,023,494**	**1,101,305**	**879,347**	**222,653**	**300,419**	**1,402,420**	**2,503,727**
Value added		52,340	1,047,065	1,099,405					
Production		**130,151**	**2,070,559**	**2,200,710**					
Imports		25,318	277,699	303,017					
Totale supply		**155,468**	**2,348,258**	**2,503,727**					

Source: Istat, National Accounts

The agriculture and agri-industry sector contributes to 6.4% of national production, supplies 6.7% of total intermediate inputs and absorbs 1.5% of the production from the rest of the economy.

The first sector can be disaggregated into more homogeneous branches with respect to products in the following way:

Tab. 4 - Input-output table of the Italian economy, 5 branches, million of euro - Year 2000

Homogeneous branches		Homogeneous branches						Final uses				Total use
		Agriculture and animal breeding	Forestry	Fishing	Food and beverages	Others	Total intermediate use	Final consuption	Gross capital formation	Exports	Total final use	
Cod.	Products of	01	02	05	15	10-14,16-95						
01	Agriculture and animal breeding	4,684	0	0	23,648	4,718	**33,050**	11,559	266	2,953	14,777	**47,827**
02	Forestry	1	4	1	11	777	**794**	209	0	108	317	**1,111**
05	Fishing	0	0	2	62	137	**201**	1,629	29	168	1,825	**2,027**
15	Food and beverages	2,228	0	21	15,707	22,046	**40,003**	52,303	309	11,889	64,500	**104,503**
10-14, 16-95	Others	5,816	62	268	25,295	995,817	**1,027,258**	813,648	222,050	285,303	1,321,000	**2,348,258**
Total intermediate		**12,729**	**66**	**292**	**64,724**	**1,023,495**	**1,101,306**	**879,347**	**222,653**	**300,419**	**1,402,420**	**2,503,726**
Value added		27,152	400	1,066	23,722	1,047,064	1,099,404					
Production		**39,880**	**466**	**1,358**	**88,446**	**2,070,559**	**2,200,710**					
Imports		7,947	645	668	16,058	277,699	**303,017**					
Totale supply		**47,827**	**1,111**	**2,027**	**104,504**	**2,348,258**	**2,503,726**					

Source: Istat, National Accounts

Only agricultural sector (agriculture and animal breeding) absorbs 18.5% of inputs from the rest of the economy to the previous first sector (agriculture and agri-industry sector) and supply 17% of intermediate inputs to it. What is more relevant is that 36.5% of Food and beverages inputs are from the agricultural sector and it follows the both sectors are strongly dependent hitch other.

If the marginal distribution are calculated it is possible to have a better view of the structure of the Italian economy:

Tab. 5 - Input-output table of the Italian economy, 5 branches (%) - Year 2000

Homogeneous branches		Homogeneous branches						Final uses				Total use
		Agriculture and animal breeding	Forestry	Fishing	Food and beverages	Others	Total intermediate use	Final consuption	Gross capital formation	Exports	Total final use	
Cod.	Products of	01	02	05	15	10-14,16-95						
01	Agriculture and animal breeding	9.8	0.0	0.0	49.4	9.9	69.1	24.2	0.6	6.2	30.9	**100.0**
02	Forestry	0.1	0.3	0.1	1.0	70.0	71.5	18.9	0.0	9.7	28.5	**100.0**
05	Fishing	0.0	0.0	0.1	3.1	6.8	9.9	80.4	1.4	8.3	90.1	**100.0**
15	Food and beverages	2.1	0.0	0.0	15.0	21.1	38.3	50.0	0.3	11.4	61.7	**100.0**
10-14, 16-95	Others	0.2	0.0	0.0	1.1	42.4	43.7	34.6	9.5	12.1	56.3	**100.0**
Total intermediate consuption		**0.5**	**0.0**	**0.0**	**2.6**	**40.9**	**44.0**	**35.1**	**8.9**	**12.0**	**56.0**	**100.0**
Value added		2.5	0.0	0.1	2.2	95.2	100.0					
Production		**1.8**	**0.0**	**0.1**	**4.0**	**94.1**	**100.0**					
Imports		2.6	0.2	0.2	5.3	91.6	100.0					
Totale supply		**1.9**	**0.0**	**0.1**	**4.2**	**93.8**	**100.0**					

Homogeneous branches		Homogeneous branches						Final uses				Total use
		Agriculture and animal breeding	Forestry	Fishing	Food and beverages	Others	Total intermediate use	Final consuption	Gross capital formation	Exports	Total final use	
Cod.	Products of	01	02	05	15	10-14,16-95						
01	Agriculture and animal breeding	9.8	0.0	0.0	22.6	0.2	1.3	1.3	0.1	1.0	1.1	1.9
02	Forestry	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
05	Fishing	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.1
15	Food and beverages	4.7	0.0	1.0	15.0	0.9	1.6	5.9	0.1	4.0	4.6	4.2
10-14, 16-95	Others	12.2	5.6	13.2	24.2	42.4	41.0	92.5	99.7	95.0	94.2	93.8
Total intermediate consuption		**26.6**	**5.9**	**14.4**	**61.9**	**43.6**	**44.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Value added		56.8	36.0	52.6	22.7	44.6	43.9					
Production		**83.4**	**42.0**	**67.0**	**84.6**	**88.2**	**87.9**					
Imports		16.6	58.0	33.0	15.4	11.8	12.1					
Totale supply		**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**					

Source: Istat, National Accounts

49.4% of agricultural production goes to food and beverages sector and 16.3% of total agricultural resources comes from abroad. Direct exports are only 6.2% but indirect exports trough Food and beverages sector increase to 11.4% (1% plus 5% of total national exports).

From the previous table it is possible to calculate the matrix of technical coefficients of the Italian economy and from this the inverse (I-A) matrix for simulation as standard Leontief open model.

Tab. 6 - Matrix of technical coefficient of the Italian economy - Year 2000

Homogeneous branches		Homogeneous branches				
		Agriculture and animal breeding	Forestry	Fishing	Food and beverages industry	Others
Cod.	Products of	01	02	05	15	10-14,16-95
01	Agriculture and animal breeding	0.10	0.00	0.00	0.23	0.00
02	Forestry	0.00	0.00	0.00	0.00	0.00
05	Fishing	0.00	0.00	0.00	0.00	0.00
15	Food and beverages industry	0.05	0.00	0.01	0.15	0.01
10-14,16-95	Others	0.12	0.06	0.13	0.24	0.42

Source: Istat, National Accounts

As expected it is higher the technical coefficient of food and beverages industry with respect to agriculture and animal breading compared to the other branches. The technical coefficient of the

agricultural branch with respect to the rest of the economy is higher the coefficient with respect the agricultural itself.

With the previous estimated model it is possible to analyse the impact and short-medium run consequences on income distribution and production in the Italian economy.

To simplify we assume for the "simulated scenario" a 50% cut of all CAP contribution to farmers on cultivations and animal breeding. This is a reasonable shift of policy in the near future, following WTO and EU recent agreements in relation to European agriculture support.

6. Impact analysis of policy changes

The first impact effect of the policy changes, assumed in the "simulated scenario", is on income distribution between households:

Tab. 7 - Household income, inequality and poverty indexes: Variations with respect to the basic scenario (%) - Year 2000

SIMULATED SCENARIO	Household income		Inequality indexes		Relative poverty index
	Median	Mean	Variation coefficient	Gini index	Intensity index (%)
Total	-3.4	-3.2	1.2	0.01	3.4
Areas of Italy					
North	-1.6	-4.4	1.9	0.06	2.0
Centre	-4.8	-3.1	1.8	0.06	1.5
South	-1.6	-2.5	1.4	0.14	2.3
Households componets					
Single	0.0	-4.1	0.1	0.02	0.9
2 - 3	-2.6	-2.7	1.8	0.03	5.0
4 - 5	0.0	-3.0	0.4	0.03	2.8
6 and more components	-3.2	-2.7	-0.1	0.47	1.8
Holder sex					
Male	-2.5	-3.5	1.3	0.00	3.0
Female	-0.8	-2.7	-7.0	0.04	1.4
Type of household					
Farmer	-1.9	-6.5	5.4	0.11	3.1
With capital income	0.0	-7.0	-1.3	0.01	1.6
Off-farm employee	0.0	-1.2	-0.2	0.03	1.2
Self employed	-0.9	-3.0	-6.4	0.00	2.1
Retired person	0.0	-2.0	-1.8	0.06	4.5

Source: elaboration on REA survey

Median and mean income of households involved in agricultural production reduces of more than 3%, inequality increases and relative poverty increase. The effect is stronger on strictly agricultural households (-6.5% of mean income) and produce a high increase of their variability (+5.4% of the variation coefficient).

The reaction of national producers that receive cut CAP contribution, in the second module, cause a general reduction of production in the agricultural sector (01 – agriculture and animal breeding homogeneous branch) of 9.76%. To start, the impact effect on national production is -0.18%. A farther consequence is the reduction of inputs demands from farmers to other farmers and to the national producers in the others sectors:

Tab. 8 - Second impact effect of 9.76% reduction of agricultural production (5 branches)

Homogeneous branches		Agriculture and animal breeding reduction	
		01	
Cod.	Products of	milion euro	%
01	Agriculture and animal breeding	-549.33	-1.15
02	Forestry	-0.10	-0.01
05	Fishing	0.00	0.00
15	Food and beverages industry	-261.37	-0.25
10-14,16-9	Others	-682.12	-0.03
Total output		**-1,492.92**	**-0.06**

Source: elaboration on REA survey and National accounts

Agricultural production reduce of a further 1.15% while national production of 0.06%. A subsequence effect is the reduction of input demand of the reduced sectors:

Tab. 9 - Third and cumulated impact effect of the reduction of agricultural production (5 branches)

Homogeneous branches		Homogeneous branches reductions					Third effect		Cumulated effect	
		Agriculture and animal breeding	Forestry	Fishing	Food and beverages	Others	Total intermediate use reduction	%	Total intermediate use reduction	%
Cod.	Products of	01	02	05	15	10-14,16-95				
01	Agriculture and animal breeding	-64.5	0.0	0.0	-69.9	-1.6	**-136.0**	-1.15	**-5,362.8**	-11.21
02	Forestry	0.0	0.0	0.0	0.0	-0.3	**-0.3**	-0.01	**-0.4**	-0.04
05	Fishing	0.0	0.0	0.0	-0.2	0.0	**-0.2**	0.00	**-0.2**	-0.01
15	Food and beverages	-30.7	0.0	0.0	-46.4	-7.3	**-84.4**	-0.25	**-345.7**	-0.33
10-14,16-9	Others	-80.1	0.0	0.0	-74.7	-328.1	**-482.9**	-0.03	**-1,165.1**	-0.05
Total intermediate consuption		**-175.3**	**0.0**	**0.0**	**-191.3**	**-337.2**	**-703.8**	**-0.06**	**-6,874.2**	**-0.27**

Source: elaboration on REA survey and National accounts

The process of national production reduction and substitution with imports of agricultural products not available from national supply can be calculate as a solution of the 95 branches input-output model, with the simplify assumption that final demand of the non agricultural branches does not change.

7. macroeconomic effects of policy changes

The total impact effect of 50% reduction of CAP contribution in Italy will be the following:

Tab. 10 - Impact effect of 50% cut of the CAP contribution to italian agricultural production (5 branches)

Homogeneous branches		Output		Output variation after CAP cut
		Year 2000	Simulated scenario	%
Cod.	Products of	milion euro		
01	Agriculture and animal breeding	58,811.7	52,130.3	**-11.36**
02	Forestry	1,331.1	1,330.0	**-0.08**
05	Fishing	2,084.1	2,083.7	**-0.02**
15	Food and beverages industry	116,472.4	115,990.7	**-0.41**
10-14,16-9	Others	2,626,822.6	2,624,679.6	**-0.08**
Total output		**2,805,521.9**	**2,796,214.3**	**-0.33**

Source: elaboration on REA survey and National accounts

The total impact on the Italian economy is greater then the starting impact on households involved on agricultural production and producers reported in the previous paragraph. The agricultural production reduces of -11.36%, food and beverages industry of -0.41% and the rest of the economy of -0.08%. Total national production reduces of -0.33%, while imports increases of +5.8%.

Finally, it is possible to verify the branches with a relevant reduction of production after policy change.

Tab. 11 - Total impact effect of 50% cut of the CAP contribution to italian agricultural production (95 branches)

Codes	Homogeneous branches	Output variation after CAP cut
	Products of	%
01	Agriculture and animal breeding	-11.59
02	Forestry and logging products	-0.07
05	Fish and other fishing products	-0.02
10.11	Coal, oil and natural gas, accessories services	-0.20
12,13,14	Ores and minerals	-0.08
15	Food products, beverages	-0.41
16	Tabacco industry	0.00
17	Textile articles	-0.01
18	Wearing apparel and furs	0.00
19	Leather and leather products	0.00
20	Products of wood, cork, straw and plaiting materials	-0.03
21	Paper and paper products	-0.09
22	Publishing and printing	-0.07
23	Coke oven products; refined petroleum products	-0.20
24	Chemical products; man-made fibres	-0.26
25	Rubber and plastics products	-0.07
26	Other minerals non-metallic products	-0.08
27	Metal and alloy	-0.03
28	Fabricated metal products, except machinery and equipment	-0.03
29	Metal products, machinery and equipment	-0.02
30	Office, accounting and computing machinery	-0.01
31	Electrical machinery and apparatus	-0.03
32	Radio, television and communication equipment and apparatus	-0.01
33	Medical appliances, precision and optical instruments, watches and clocks	-0.01
34.35	Transport equipment	-0.02
36	Furniture and other manufactoring products	-0.01
37	Recycling materials	-0.03
40	Electricity distribution services; gas and water distribution services through mains	-0.20
41	Water transport services	-0.62
45	Construction services	-0.02
50	Trade, motor vehicle and motorcycle repair services	-0.07
51	Wholesale trade except motor vehicle and motorcycle	-0.19
52	Retail trade except motor vehicle and motorcycle	-0.11
55	Hotels and restaurants	-0.02
60	Land transport services	-0.17
61	Carriage by sea	-0.05
62	Air transport services	-0.06
63	Supporting and auxiliary transport services	-0.08
64	Postal and telecommunications services	-0.06
65.67	Financial intermediation, excluded insurance and auxiliary services	-0.18
66	Insurance and pension fund, excluded compulsory social security	-0.09
70	Property services	-0.02
71	Rent machinery	-0.08
72	Computers and services	-0.09
73	Research and development services	-0.07
74	Professional services	-0.09
75	Public administration and other services to the community as a whole; compulsory social security services	0.00
80	Education services	0.00
85	Health and social services	-0.01
90	Sewage and refuse disposal, sanitation and other environmental protection services	-0.18
91.92	Recreational, cultural and sporting services	-0.06
93.95	Domestic services	0.00
Total output		**-0.33**

Source: elaboration on REA survey and National accounts

Relevant effects are on water transport services (-0.62%) and on food and beverages industries (-0.41%). The other affected branches are: transport services; sewage and refuse disposal, sanitation and other environmental protection services; chemical products; electricity and gas distribution services; professional services; wholesale and retail trade; other services.

8. Conclusions

The simulation model of the European Common Agricultural Policy (CAP) presented in this paper allows to analyse the consequences of policy changes and to forecast, on quantitative base the future scenario for Italian economy. The results demonstrate the potentiality of analysis of the mix approach adopted for the model: effects on households incomes, distribution and production have been studied from the micro (households and farms) to the macro (Italian economy) moving through economic sectors (homogeneous branches).
A cut of 50% of CAP contributions to farmers on their cultivations and animal breeding produces a relevant effect on the agricultural sector but also on the total economy and imports. The macro effect on Italian economy is relevant but not dramatic due to the structure and the specialisation of the Italian economy: services and industry are nowadays the first sectors. Anyway, this is not the final effect of policy changes: furthers long run changes could be generated by investments and structural changes of national producers. Black and informal economy is also high in this sector (from National Accounts estimates) and the effects on this part of the economy could not be forecasted with a simulation on official data. Finally, more relevant effects could be considered if a greater detail in terms of products will be available in the future: some chemical products (fertilizers, insecticide, etc.), machinery and equipment (tractors, machinery for harvesting, pickers, farm machinery, etc.) and specific services to agriculture. Also some agriculture and agri-industry "filiera" (sugar, durum wheat, tobacco, olive oil, industrial crops, milk, etc.) are more affected and then the others and the aggregate analysis does not allow to see it. A further deeper analysis should be done on the dimension of produces to a better consideration of their behavioural functions.
In conclusion a reason to use simulated data is that to integrate official statistics to complete information necessary for policy evaluation. Lags and costs necessary to produce statistical data, are limitations that make inefficient the information with respect to final use, when this is the base to check the effects of previous decisions and to take further ones under uncertainty conditions.

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