TRENDS FOR GROSS SALEABLE PRODUCT IN THE FORESTRY SECTOR: AN ANALYSIS OF THE DIFFERENCES IN SOME ITALIAN REGIONS OF THE MEDITERRANEAN AREA

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ABSTRACT

The aim of the research is to analyse the trends of a significant economic variable, the Gross Saleable Production in the forestry sector (expressed both at current and constant prices), by comparing it at a regional and average national level and by paying attention to the categories used in ISTAT (Italian Institute of Statistics) publications for the disaggregation of raw timber and non-wood products. For the purpose a descriptive technique of the regional and national trends, which allows to pick out the distinctive features of Gross Saleable Production development in the considered period (1980-1993), has been used. This methodology, the so-called "Shift-and-Share Analysis" of the Anglo-Saxon literature, allows to look into the growth of a sector in a certain period, in the present case in some italian regions lying in the Mediterranean basin. Through this analysis not only has it been possible to check in what degree the trend of regional Gross Saleable Production is different from the national one, but also which components (structure and growth effect) have mainly contributed to determine such regional-national differences. The information obtained from the application of this method to the forestry sector, not without theoretical limits, can provide useful indications, patticularly as a starting point for further investigation.

RÉSUMÉ

Le but de cet étude est d'analiser, pour ce qui concerne le secteur forestier, l'évolution d'un indice économique significatif comme la production brute commercialisable, en comparant les données de chaque région méridionale italienne avec la moyenne nationale et en considérant certaines catégories dans lesquelles on peut subdiviser le bois brut et d'autres produits forestiers. Dans ce but on a préferé employer une technique descriptive des dynamiques régionales et nationales qui permet de déterminer les caractéristiques du mouvement de la production brute commercialisable dans une période considérée (1980-1993). Dans la littérature anglo-saxonne cette technique d'analyse est nommée "Shift and Share Analysis" et, en ce cas, cherche à connaître le processus de croissance du secteur dans certaines régions de l'Italie du Sud pendant une période de temps (14 ans). Par cette méthode on n'a pas seulement réussi à évaluer les differences entre le mouvement de la production brute commercialisable régionale et celui là national, mais on a aussi compris la contribution des facteurs structurals ed de croissance à déterminer cet écart. Malgré des défauts, cet étude peut etre considéré une très intéressante prémisse à d'ultérieurs approfondissements.

The analysis of agro-forestry land and in particular of agricultural systems, has always represented a very important field of research for most Italian agricultural economists.

This study aims at interpreting the variations in the Gross Saleable Product (GSP) of the forestry sector, divided into the main sub-sectors of production, referred to uniform areas from the coltural system point of view in the period 1980-1993. Nevertheless the problems related to the available territorial disaggregation, that is the regional level by ISTAT (Italian Institute of Statistics), do not allow to carry out a punctual analysis because regions include many diversified situations. The research has been carried out on the whole Italian territory, but in this paper, considering the main theme of the conference, only the results of some regions with typically Mediterranean climatic features (Liguria, Toscana, Lazio, Campania, Puglia, Calabria, Sicilia and Sardegna) will be examined. The "Shift and Share Analysis" technique has been chosen because already applied to the agricultural sector (see References) and, more generally, in regional economics in order to study the growth process of the whole economic system or of a specific branch of activity. The peculiarities of this analysis will be examined in detail in the following section where its qualities and limits will be pointed out, in order to evaluate properly the reliability of the results obtained. The GSP of the forestry sector, according to ISTAT data, has been characterized, in the studied period, by moderate growth trends, at least when expressed at constant prices. The timber use in the last decades has been slightly fluctuating, either upwards or downwards without affecting the national requirements, which are at present very high (46 millions cubic metres, 16 millions of which concern raw wood). This situation has brought Italy to become one of the main importing countries in the world: actually the increased needs of the whole forestry system have been satisfied by a more and more massive recourse to importation, both for raw wood and for processed wood, because of the bad structural condition of forestry properties and other sub-sectors (timber use enterprises and sawmills). The high degree of land fragmentation come out from the last Agricultural Census (average farm surfaces equal to 3 hectares), the marginal weight of industrial roundwood forests for quality production, the predominance of coppice (3,600,000 hectares, correspondent to 53% of the whole forestry surface), often

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situated in areas which are difficult to reach, the relevant weight of products with a low unit value, only represent some of the grounds that have made an efficient use of national forestry patrimony difficult. Therefore the constant increase of the forestry surface in the last decades has not turned into a corresponding development of the economic activities in the sector, except for the alpine regions and some specialised crops (e.g. poplar-growing).

METHODOLOGICAL APPROACH

This research deals with the analysis of the GSP trends in the forestry sector in a fixed period, by comparing the increase trends concerning single regions with the national average. A descriptive technique of regional and national trends, called "Shift and Share Analysis" in the Anglo-Saxon literature, has been used. The forestry GSP has been disaggregated into four sub-sectors: it allows to investigate the growth process of the whole economic system or of a particular branch, by identifying in the meantime some causal factors associated with GSP changes. This analysis enables to disaggregate the absolute variation of a particular phenomenon (in the case study at regional level) into different components. The overall regional growth is divided into three different effects: a) national growth effect; b) structure effect, c) regional growth effect.
Forestry GSP of a sub-sector at regional level is assumed as a starting point:
gr = GSP growth rate in the "r" region;
g = GSP growth rate in the whole Italian forestry sector;
gir = GSP growth rate in the sub-sector "i" of the "r" region;
gi = GSP growth rate in the sub-sector "i" of the whole Italian forestry sector;
$w\ °ir$ = weight of the sub-sector "i" in the GSP of the "r" region at the starting time;
$w\ °i$ = weight of the sub-sector "i" in the GSP of the whole Italian forestry sector.
Bringing "g" to the first member:

$$gr - g = \sum_i (w\ °ir - w\ °i)\ gi + \sum_i (gir - gi)\ w\ °ir$$

where:
$gr - g$, represents the differential growth (Δ G) of the "r" region in comparison with the whole national forestry sector one. It can be grouped into two components:

$\sum_i (w\ °ir - w\ °i)\ gi$ regional structure component (c)

$\sum_i (gir - gi)\ w\ °ir$ regional growth component (g)

Shift and Share Analysis assigns a precise meaning to the above-mentioned components;
the first one represents the contribute given by the region to the growth of forestry GSP;
the second component is a part of the regional growth due to the particular sectorial structure of the region; it depends upon the different weights that the sub-sectors have at a regional and national level.
Finally, the third component represents the regional growth due to the favourable or unfavourable conditions of the different sub-sectors in the region.
In conclusion the first component, "national growth effect", shows how much the phenomenon would have developed in the region if it had kept, in the considered period, the same growth rate at a national level.
The second component, "structure effect" (c), measures how much the regional growth differential would have been, supposing all the regional sub-sectors had developed at the same rate as the national ones. In that case, the growth differential would be caused by the different weight percentages of the sub-sectors which compose the whole sector as regional level, compared to the same sub-sector at national level.
The third component "growth effect" (g), measures (in terms of annual average rate) the difference between the real regional growth rate, and the one under the assumption that the regional and national growth were equal.
This version of the analysis is the most used, although in the past years some authors have introduced several modifications. One of these, according to Balestrieri Terrasi (1982), consists in carrying out the analysis by means of both current and constant prices data.
Actually it would not be necessary to deflate current values in Shift and Share Analysis, because the absolute changes occurred over the period are not as important as the relative ones occurred in an area in comparison with other regions. But the use of the analysis only at constant prices could conceal the possible modifications occurred in the relative prices of different commodities and/or in the various regions, which are very significant to determine both the structural and differential component in the growth process of regional production. The choice to carry out the analysis at current and at constant prices and to compare the results obtained, enables to point out the real function of prices. Shift and Share Analysis over the years has undergone criticism on several grounds, especially because of the results variableness in consequence of the sectorial disaggregation used in the application. In fact, some authors have remarked that when the disaggregation level rises, the structural component increases as well, while the regional growth component decreases. The explanation for this trend is that both the components vary when the number of sub-sectors rise and precisely, the differential component tends to vanish, while the structural one tends to be equal to the overall

sliding. Therefore, a satisfactory disaggregation level and an as full as possible homogenization of the considered sub-sectors growth rates are needed, in order to obtain a sufficient reliability of the results. Nevertheless, this problem is not very hard in the agricultural applications because it is not so indispensable to get a high level of disaggregation in this sector, even though there is always a minimum value (as to number of sub-sectors) below which the risk the results are misrepresented is far higher. The geographical and temporal disaggregation can also influence directly the results: in fact as for the first factor, from a higher to a lower level of territorial disaggregation, if the latter included sub-sectors with different growth rates, the analysis would not allow to isolate the effects due to the considered components. The second factor can affect the results, because during the period the structure of the sub-sectors can change; given that the first version of the analysis takes into consideration the weights of the sub-sectors at the starting time (w^0), it would be proper to carry out two analyses using alternatively the starting point and the final point (w^1), and then to average the results obtained.
This procedure has been followed by the authors even in this research.
Another criticism aroused against the analysis concerns the underestimate of the real value of the structural component. This error would not derive from factors linked to the sub-sectors, but from interrelations with other sectors of the economic system having high or low growth rates, which involve dragging or slowing down problems.
In these circumstances the analysis relates these phenomena to the growth component while they should be more properly ascribed to the structural weakness of the region. Since the sectorial interrelationships are not so close, the application of this method to the agricultural sector should not produce significant errors. In the light of what has been said, many researchers question themselves on if and to what extent the approach provided by Shift and Share Analysis can be considered valid. Some of these state that the Shift and Share Analysis cannot be considered as a useful analytic framework for regional surveys and that differences between national and regional growth rates are not stable. Other authors maintain that it provides a rational way to identify the causes of the differences in the growth rates among the regions. Apart from these attacks on the technique, according to which SSA is to be considered merely a descriptive tool, this analysis has at least a quality, that is the possibility to use a big amount of data, by isolating structure and growth components. So the analysis of economic variables, expressed in terms of differential average growth rates, makes the inter-regional and inter-temporal comparisons possible and enables to lead the study in direction of the possible causes which have determined the results. Finally, as Balestrieri noted (1982), regional policy could represent another field of application for SSA, either as a guideline for legislative interventions or in order to evaluate the effects of a certain policy in an established period. In fact the more an intervention policy succeeds in increasing the value of the differential and of structural component (whereas the circumstances require so), the more effective it is.

Analysis of the results

Overall Gross Saleable Product (GSP) growth differentials (ΔG)

As stated in the previous section, the results derive from the average made on two Shift and Share Analysis where the base year has been varied from the starting one (1980) to the final one (1993), in order to pay attention to the possible structural transformations over the period. Furthermore, the data used in the analysis have been obtained from the average on a three-year period (1980-81-82 and 1991-92-93), in order to mitigate possible distorsions caused by particularly favourable years. The results of the analysis, discussed in this section and in the following ones, are briefly summarized in the tables and in the figure (**tables 1-9** and **figure 1**).
Among the examined regions, only Liguria and Sicilia show an overall negative value, both at current and constant prices.
As for Liguria, at constant prices (1987) the total result is highly negative (– 28.0%), with fuelwood as the worst sub-sector (– 23.6%), while the others are close to zero. At current prices the overall trend is even more unsatisfactory (– 56.4%), shared among the sub-sectors in the following way: – 37.1% fuelwood, – 16.3% industrial roundwood and finally – 1.9% non-wood products and – 1.1% charcoal.
Sicilian regional trend (at 1987 prices) is negative (– 10.9%), but disaggregating the datum remarkable variations in the values for the sub-sectors can be noticed; in fact, for fuelwood and charcoal the value is negative (– 11.3% and – 12.2% respectively), while for industrial roundwood and non-wood products ΔG is positive (+ 6.7% and + 5.9%).
At current prices the situation is different, since the only positive value (+ 23,5%) concerns non-wood products, while fuelwood (– 28.1%), industrial roundwood (– 5.7%) and charcoal (– 7.8%) are negative; total ΔG is equal to – 18.1%.
In Toscana ΔG is equal to + 54.9% at 1987 prices, distributed among the main sub-sectors as follows: fuelwood with a significant weight (+ 37.4%) and industrial roundwood with a more modest contribution (+ 17.4%).

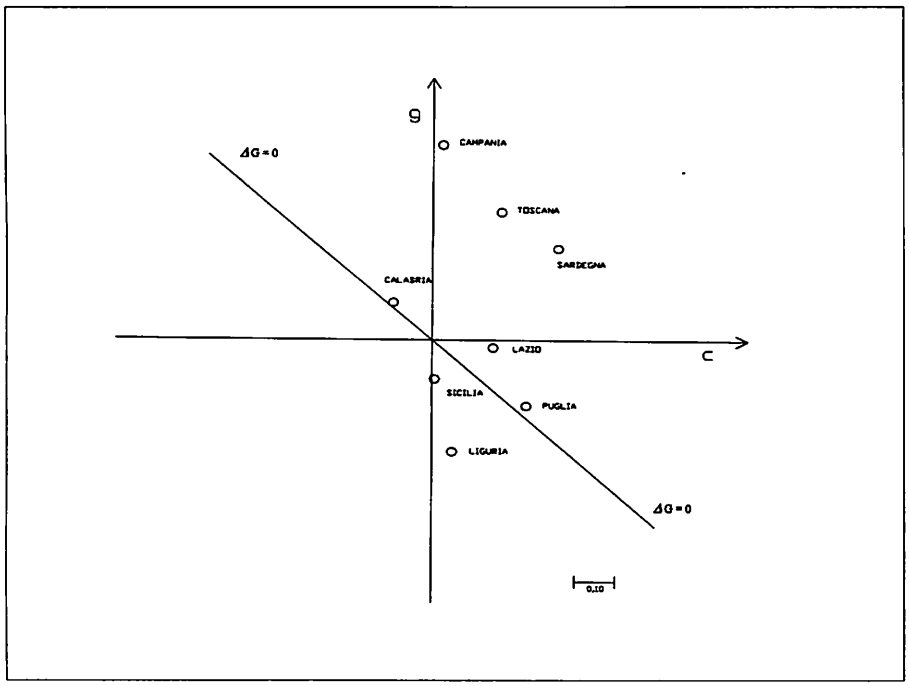

Figure 1 - Regional distribution of growth component (g) and structure component (c).

At current prices, the regional growth trend, compared with the national one, is still higher (+ 108.2%), thanks to the fuelwood sub-sector which has + 101.4%.
The analysis at constant prices in Lazio has pointed out an overall growth (ΔG) equal to + 12.7%; in detail, fuelwood and industrial roundwood prove to be in good conditions (respectively + 7.9% and + 5.6%) and, on the contrary, charcoal and non-wood products have a negative value (– 0.6% and – 0.2% respectively).
At current prices the total growth is much higher (+ 24.3%), with different situations inside the various sub-sectors: the most remarkable result is + 41.7% for fuelwood, followed by the negative value of industrial roundwood (– 15.0%).
The highest positive value for ΔG (at 1987 prices) is in Campania (+ 60.3%), mainly provided by fuelwood (+ 50.3%) and by industrial roundwood (+ 12.6%); on the contrary, the other two sub-sectors contribute to lower total growth, since they have given negative results, even though they are not very meaningful in absolute terms (– 2.4% and – 0.2% respectively for charcoal and non-wood products).
At current prices the overall growth is equal to + 113.3%; most of this result is due to fuelwood (+ 99.5%), followed by industrial roundwood (+ 17.4%), while charcoal and non-wood products show negative values (– 2.2% and – 1.4%).
In Puglia the analysis at constant prices leads to a satisfactory result, although it is not very high in absolute value (+ 3.7%). The disaggregation into sub-sectors, in order to examine their trends, has indicated that the situation is good only for industrial roundwood (+ 14.8%), while the other products present negative results (fuelwood – 9.3%, charcoal – 1.4%). In the analysis at current prices it can be noticed that ΔG is slightly different, but at sub-sector level there are substantial changes as to the weights of each contribution: industrial roundwood value is now negative (– 12.3%), in contrast with the positive result at constant prices and a reverse situation can be found in the case of fuelwood (at constant prices – 9.3% and at current prices + 20.6%).
In Calabria (+ 1.6% at 1987 prices and + 4.9% at current prices) ΔG has nearly the same value as in Puglia, but going into details it can be brought into evidence that industrial roundwood by itself is able to determine the regional positive result with + 7.7% at 1987 prices and + 25.1% at current prices.
Sardegna has obtained the second positive ΔG (at constant prices + 58,1%), due to the following distribution among the sub-sectors: industrial roundwood shows a remarkable growth compared with the same sub-sector at national level (+ 33.9%), while the ones concerning fuelwood and non-wood products are less strong and finally charcoal has a value very close to zero (+ 0.1%).In the analysis at current prices of the regional forestry sector the most important differences are represented by a more resolute growth for fuelwood and non-wood products (+ 49.2% and + 43.8%), while the weight of charcoal is rather marginal (– 0.1%).

Regional analysis of "growth effect" and "structure effect"

The SSA technique enables to determine the simultaneous effects due not only to the different structures of sub-sectors at regional and national levels (structure effect), but also to the different growth rate between the regional and national average (growth effect), taking into account the overall GSP variations in a determined time period (1980-1993). As for the "structure effect", it is worth noting that only one region, Calabria, has a negative value (– 18.5% at current prices and – 9.5% at constant prices), showing that the structure of the four sub-sectors is such as to make the forestry sector unable to take advantage of the national growth trend. On the contrary, the other regions have structural positive values, even though they highly differ: such values range in fact from + 63.4% of Sardegna to + 2.5% of Sicilia as to current prices and from + 30.8% (Sardegna) to + 0.6% (Sicilia) as to constant prices. Generally the structural component of a sector is related to its capability of ad-

justing its own structure to the market demand, so it could be strange to discover positive values in the examined areas which, for the majority, have remarkable problems with regard to this component; but it is also worthsaying that the overall GSP of the forestry sector includes sub-sectors data, such as non-wood products which would show how many diversified commodities (with different situations each) exist inside them, if it were possible to disaggregate. "Growth effect" measures differences between the actual regional growth rate and the hypothetical one in case the GSP should adjust itself to follow the national trend.
Liguria, Lazio, Puglia and Sicilia have negative values, both at constant and current prices, while Toscana, Campania, Calabria and Sardegna have positive values.
Terrasi Balestrieri (1982) resumed a preceding classification of Martellato's (1977) and adapted it to the agricultural sector. It is based upon the possible different combinations of the values assumed by the two components "g" and "c" and allows to carry out a classification of regions, according to the scheme reported in **table 9**. When a region falls under class 1 and 4, interpretation is easy because both the components are positive in 1 and negative in 4; in classes 2 and 3 the "growth effect" is positive, showing that a region has a good composition of sub-sectors but it is not competitive at all (negative "growth component"), probably not because of sectorial internal deficiencies, but in consequence of the competition of other productive sectors.
Finally, the structural component is negative in class 5 and 6, while the growth component is positive in both classes; it could be the case of economically less-developed regions in the economic system, which cannot adjust their structure to market demand although they can be particularly competitive at that very moment.
Sardegna comes under class 1 at both constant and current prices, Toscana and Campania under class 1a, Lazio and Puglia class 2, Liguria and Sicilia under class 3 and Calabria class 6; class 4, 4a and 5 are not represented by any region included in the research. Sardegna, Toscana and Campania are the only regions where both the effects are positive, but the only difference between them is that the structural component prevails against the growth one in Sardegna, while the inverse situation occurs in Toscana and Campania. Lazio, Puglia, Liguria and Sicilia belong to class 2 and 3, with a positive structure effect and a negative regional growth effect; but the first component (structure) has a value, in absolute terms, higher than the second one (growth) in Lazio and Puglia and lower in Liguria and Sicilia (where the structure is not far from zero, being 9.2% and 4.9% in Liguria, 2.4% and 0.6% in Sicilia).
Finally, Calabria falls under class 6, with a negative structure effect; the second component is on the contrary positive and has an absolute value higher than the former.

Sectorial disaggregation of "structure effect" and "growth effect"

Once the two components have been analysed in the whole forestry sector, the relative weight assumed by each sub-sector to determine the values regarding "g" and "c" must be examined. The sectorial disaggregation of the studied index (GSP), that is the homogenization of the single sub-sector, enables in fact to obtain more and more reliable results. In this study, forestry GSP has been sectioned into four sub-sectors – according to ISTAT Forestry Statistics Yearbook – including industrial roundwood, fuelwood, charcoal and non-wood products. This subdivision is not certainly highly disaggregated, since items like industrial roundwood and non-wood products include products with a highly diversified unit-value, such as sawlogs, veneer wood, wood for particle boards, wood pulp, wood for fencing, timber for tannin, etc. for the first sub-sector and mushrooms, pine-seeds, chestnuts, acorns, cork, gum, resin, etc. for the second one. Furthermore, problems due to data reliability are to be pointed out: in fact statistical enquiry of non-wood products, carried out by ISTAT, is especially made difficult by the prevalence of household consumption (mushrooms, pine-seeds, chestnuts, etc.), supply dispersion (acorns) and the lack of a controllable market. The results of sectorial disaggregation within the single regions are commented upon in the following paragraphs.

Liguria

The fuelwood sub-sector is quite considerable having a negative regional growth effect (– 49.8%) and a substantially satisfactory structure effect (+ 12.7%).
On the contrary, non-wood products are hardly important as to regional growth effect but have a remarkable weight as to structure effect (– 1.8%). For the structure component some differences have been noticed at current and constant prices: while as for 1987 prices industrial roundwood is greatly contributing (+ 3.8%) to the overall positive effect thanks to a composition of sub-sectors such as to prevail against the national one in quantitative terms, at current prices it has a rather negative value (– 1.6%). For the opposite reason, fuelwood decreases from + 12.7% at current prices to + 1.7% at constant prices.

Toscana

With regard to regional growth effect, fuelwood has a very positive value at current prices (+ 64.1%), which confirms its importance in this region. Only non-wood products, among the sub-sectors, have obtained a negative value (– 0.5%), even though industrial roundwood and charcoal are scarcely considerable too (respectively + 11.9% and + 0.3%).

Table 1 ***Liguria***
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	-14.7%	-1.6%	-16.3%	-7.0%	3.8%	-3.2%
Fuelwood	-49.8%	12.7%	-37.1%	-25.3%	1.7%	-23.6%
Charcoal	-1.1%	0.0%	-1.1%	-0.5%	-0.2%	-0.7%
Non-wood products	-0.1%	-1.8%	-1.9%	-0.1%	-0.4%	-0.5%
Total	-65.7%	9.3%	-56.4%	-32.9%	4.9%	-28.0%

Table 2 ***Toscana***
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	11.9%	-5.1%	6.8%	5.8%	11.6%	17.4%
Fuelwood	64.1%	37.3%	101.4%	32.4%	5.0%	37.4%
Charcoal	0.3%	0.1%	0.4%	0.1%	0.2%	0.3%
Non-wood products	-0.5%	0.1%	-0.4%	-0.2%	0.0%	-0.2%
Total	75.8%	32.4%	108.2%	38.1%	16.8%	54.9%

Table 3 ***Lazio***
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	-10.3%	-4.7%	-15.0%	-5.1%	-10.7%	5.6%
Fuelwood	6.9%	34.8%	41.7%	3.2%	4.7%	7.9%
Charcoal	-1.0%	-0.0%	-1.0%	-0.5%	-0.1%	-0.6%
Non-wood products	0.3%	-1.7%	-1.4%	0.1%	-0.3%	-0.2%
Total	-4.1%	28.4%	24.3%	-2.3%	15.0%	12.7%

Table 4 ***Campania***
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	18.8%	-1.4%	17.4%	9.5%	3.1%	12.6%
Fuelwood	91.9%	7.6%	99.5%	49.3%	1.0%	50.3%
Charcoal	-1.9%	-0.3%	-2.2%	-1.0%	-1.4%	-2.4%
Non-wood products	0.2%	-1.6%	-1.4%	0.1%	-0.3%	-0.2%
Total	109.0%	4.3%	113.3%	57.9%	2.4%	60.3%

Table 5 *Puglia*
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	-4.9%	-7.4%	-12.3%	-2.0%	16.8%	14.8%
Fuelwood	-32.4%	53.0%	20.6%	-16.5%	7.2%	-9.3%
Charcoal	-1.3%	-0.1%	-1.4%	-0.7%	-0.7%	-1.4%
Non-wood products	-0.2%	-1.4%	-1.6%	-0.1%	-0.3%	-0.4%
Total	-38.8%	44.1%	5.3%	-19.3%	23.0%	3.7%

Table 6 *Calabria*
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	23.3%	1.8%	25.1%	11.8%	-4.1%	7.7%
Fuelwood	-2.5%	-18.3%	-20.8%	-2.0%	-2.5%	-4.5%
Charcoal	2.4%	-0.5%	1.9%	1.2%	-2.6%	-1.4%
Non-wood products	0.2%	-1.5%	-1.3%	0.1%	-0.3%	-0.2%
Total	23.4%	-18.5%	4.9%	11.1%	-9.5%	1.6%

Table 7 *Sicilia*
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	-2.4%	-3.3%	-5.7%	-0.8%	7.5%	6.7%
Fuelwood	-18.4%	-9.7%	-28.1%	-10.0%	-1.3%	-11.3%
Charcoal	-5.9%	-1.9%	-7.8%	-3.2%	-9.0%	-12.2%
Non-wood products	6.2%	17.3%	23.5%	2.5%	3.4%	5.9%
Total	-20.5%	2.4%	-18.1%	-11.5%	0.6%	-10.9%

Table 8 *Sardegna*
Shift and Share Analysis of Gross Saleable Production (GSP) in the forestry sector for the period 1980-82/1991-93.

Sub-Sector	GSP at current prices			GSP at constant prices		
	growth g	*structure c*	*differential* ΔG	*growth g*	*structure c*	*differential* ΔG
Industrial roundwood	32.1%	-8.0%	24.1%	15.7%	18.2%	33.9%
Fuelwood	22.2%	27.0%	49.2%	12.3%	3.6%	15.9%
Charcoal	-0.2%	0.1%	-0.1%	-0.1%	0.2%	0.1%
Non-wood products	-0.6%	44.4%	43.8%	-0.5%	8.7%	8.2%
Total	53.5%	63.5%	117.0%	27.4%	30.7%	58.1%

Table 9 ***Regional classification according to the components*** **c** ***and*** **g.**

i if	$c \geq 0$	$g \geq 0$	and	$\|c\| > \|g\|$
1a if	$c \geq 0$	$g \geq 0$	and	$\|c\| < \|g\|$
2 if	$c > 0$	$g > 0$	and	$\|c\| \geq \|g\|$
3 if	$c > 0$	$g > 0$	and	$\|c\| < \|g\|$
4 if	$c \leq 0$	$g \leq 0$	and	$\|c\| > \|g\|$
4a if	$c \leq 0$	$g \leq 0$	and	$\|c\| < \|g\|$
5 if	$c < 0$	$g < 0$	and	$\|c\| > \|g\|$
6 if	$c < 0$	$g < 0$	and	$\|c\| \leq \|g\|$

Fuelwood has quite an important structure effect as well (+ 37.3%), while industrial roundwood has a negative value (– 5.1%). At constant prices, the structure component of fuelwood undergoes a strong reduction (from + 37.3% to + 5.0%), meaning that the sub-sector growth is mainly due to prices rather than to quantities. At the same time a sign change in the structural component of industrial rounwood can be pointed out: it goes from – 5.1% to + 11.6%, showing a better composition of this sub-sector in quantitative terms.

Lazio

As for growth effect at a regional level, industrial roundwood (with – 10.3% compared to the national average) negatively affects the whole regional forestry sector, despite the considerable contribution of fuelwood (in absolute value). On the contrary, as far as structure effect is concerned, the fuelwood sub-sector succeeds in balancing the negative effect value of industrial roundwood thanks to a very positive value (+ 34.8% and – 4.7% respectively). Non-wood products is an important sub-sector, even though with some structural deficiencies (– 1.7%). At 1987 prices the trend of the regional growth component is equal to the one at current prices; as to structure effect fuelwood decreases (+ 4.7%), while industrial roundwood has quite a satisfactory result from a quantitative point of view (+ 10.7%).

Campania

With regard to regional growth effect at current prices, fuelwood is here, like in Toscana, a very important sub-sector (+ 91.9% compared to the national average). On the contrary, charcoal is the only one which has a negative result (– 1.9%). As for the structural component, fuelwood has a positive value, even if its contribution is not extremely relevant (+ 7.6%); the other sub-sectors have negative results, but not such as to prevail against the absolute value of fuelwood. At 1987 prices the positions of fuelwood and industrial roundwood are reversed, showing the first a considerable decrease (it goes down to + 1.0%) and the latter a relevant improvement from a structural point of view (+ 3.1%). Furthermore, charcoal falls from – 0.3% at current prices to – 1.4% at constant prices, considerably worsening its structural situation.

Puglia

At current prices it shows some deficiencies with regard to the regional growth component, balanced however by a good structural level. Fuelwood (– 32.4%) is the sub-sector which, as to the first component (regional growth) negatively affects the whole sector, while industrial roundwood, with just – 4.9%, does not play a relevant role, as well as charcoal and non-wood products, whose results are, respectively, – 1.3% and – 0.2%. Structure effect is highly positive, exclusively thanks to fuelwood (+ 53.0%); the rest of the sector shows some structural problems, especially with regard to industrial roundwood (– 7.4%) rather than to the other sub-sectors (– 1.4% non-wood products and – 0.1% charcoal).
The same may be noticed in the regional growth component at 1987 prices, while the results of the analysis at current prices have sensibly changed: in fact for the structural component the high positive value (+ 23.0%) is mainly given by industrial roundwood (+ 16.8%), meaning that the GSP trend of the sub-sector is very negatively affected by prices.

Calabria

The industrial roundwood sub-sector provides a strong contribution to the overall result of the national growth component (+ 4.9%), equal to + 23.3% for the regional growth effect and to + 1.8% for the structural effect. The latter proves to be highly negative (– 18.5%) in consequence of the bad results of the other sub-sectors, which are diversified among them (– 18.3% fuelwood, – 1.5% non-wood products, – 0.5% charcoal). At constant prices this component shows only negative values, and particularly the industrial roundwood sub-sector has definitely worsened its structural situation in quantitative terms.
As for the regional growth component, the sub-sectorial composition is the same as the one at current prices.

Sicilia

The regional growth effect is rather negative for each sub-sector examined, with the only exception of non-wood products; fuelwood is the sub-sector which has the worst result, equal to – 18.4%, representing most of the overall value of the forestry sector (– 20.5%); from the structural point of view, the analysis has pointed out, on average, quite a good situation, but this is only thanks to the result of non-wood products (+ 17.3%) which balance the negative value found for fuelwood (– 9.7%), industrial roundwood (– 3.3%) and charcoal (– 1.9%).
At 1987 prices some substantial differences have been noticed: for the structural component, they concern mainly the good result of the industrial roundwood, which make the total value for the sector positive (+ 0.6%), together with the non-wood products sub-sector (+ 3.4%).

Sardegna

The regional growth component is clearly positive (+ 53.5%), especially in relation to the results gained by industrial roundwood (+ 32.1%) and fuelwood (+ 22.2%); on the contrary, charcoal and non-wood products hold a marginal position in the economy of the sector (respectively – 0.2% and – 0.6%). As for the structural component, the relative weight of the sub-sectors is noticeably different: in fact the value is very high for non-wood products (+ 44.4%), which are followed by fuelwood (+ 27.0%), while the industrial roundwood subsector is not very well structured (– 8.0%). At constant prices it has been found that the leading sub-sector is industrial roundwood (+ 18.2%) for the structural effect, pointing out a good situation in quantitative terms, unlike at current prices. Besides, the contribution provided by non-wood products is noteworthy (+ 8.7%), followed from afar by fuelwood (+ 3.6%).

Conclusions

The application of the Shift and Share Analysis has allowed an assessment of the changes in forestry Gross Saleable Product occurred in some Italian regions in a specific period of time (1980-1993). In detail, firstly the trends of regional forestry GSP have been studied and compared with the national one, then the total growth increment has been separated into two components, *g* and *c* (growth and structure effect), whose contribution to the overall trend has been analysed. Summarizing the results of the study, almost every region examined showed positive values for ΔG, with the exception of Liguria and Sicilia, both at current and at constant prices. The isolation of *g* and *c* components from ΔG value, either at sectorial or at sub-sector level, enabled to point out some distinctive features for each region, the most significant of which are here reported. With regard to the structure effect, the only negative value has been noticed in Calabria; in the other regions, even if with a wide range whose superior and inferior extremes are represented respectively by Sardegna and Sicilia (for the latter however the result is not satisfactory), the structural situation can be defined good to a certain extent. The regional growth component (at current and at constant prices) shows a minus sign in Lazio, Liguria, Puglia and Sicilia and a plus sign in the remaining regions. The results obtained by disaggregating the forestry sector into four main sub-sectors (industrial roundwood, fuelwood, charcoal and non-wood products), already commented upon in the preceding paragraph, on the one hand provide a possible insight into the present condition of these regional sub-sectors and on the other give an impulse for some remarks concerning the explanatory capacity of SSA. The methodological validity is growing with the level of geographical disaggregation and therefore the separation into four sub-sectors, according to the available ISTAT data, has probably brought about a distorsion of the results, especially those regarding industrial roundwood and non-wood products, partially hiding the links between the values of the two components and the causes which have determined them.

The analysis, which can suggest the application of forestry policies able to rectify the above mentioned structural anomalies, could be useful provided that the base situation is analysed by statistical data with a sufficient degree of reliability.

In regions such as Sicilia, placed at the bottom of the regional classification in spite of the good potentialities of structural improvement in the forestry sector as for orography, marginality of inland agriculture, manpower availability and the big amount of financial resources assigned to the sector, the serious problems pointed out by this application of SSA could be mitigated or solved by acting, on the ground of the indications provided by this study, on the various sub-sectors of the forestry system. This study should be regarded only as a starting point for further refinements which aim at investigating the cause-effect relationships, in order to overcome the present limitations inherent to this technique of analysis. ●

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