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FACTORS OF DEVELOPMENT OF THE HARVESTING FIRMS IN SUCEAVA, ROMANIA

The paper proposes an empirical analysis of the demand and supply as they appear trough the auctions for standing timber organised by the Forest Directorate Suceava, a regional branch of the National Forest Administration located in the Northern part of Romania.
The results confirm that there is a trend of territorial concentration of large firms, which are able to influence the decisions of the small-size agents. On the other hand, the capacities for harvesting activities are over-sized compared with the annual resource available at the level of the Forest Directorates. Second, the evolution of demand and supply before, during and after the storm event which occurred in 2002 shows how the entrepreneurs reacted to different supply context. It appears that after the storm period the demand is much more fragmented and small-sized, and the competition is very strong. Compared with the situation before the storm, the number of firms is 25% higher, while the supply is reduced by 50%. We advance some hypotheses to explain whey the number of firms did not decrease with the decreasing of the timber supply and why the sector is facing apparently irrational economic choice, e.g. harvesting economic inefficient tracks.
Finally, the paper helps to identify some key fields for the further development of the research.
JEL: Q3, Q21, Q28

Introduction

The changes that the forest sector faced in Romania since 1990 completely modified the trade relationship and the timber market system. New forms of ownership appeared on forestland, and private firms started to operate in whole wood processing chain. Nevertheless, along the last decade the timber market was characterised by the position of the National Forest Administration (NFA) as main supplier of timber for industrial purposes.
The State intervention on timber market aimed to regulate this quasi-monopole; to enhance sustainable forest management; to enhance profitability and economic efficiency of the management of the public forests; to allocate resource (the timber

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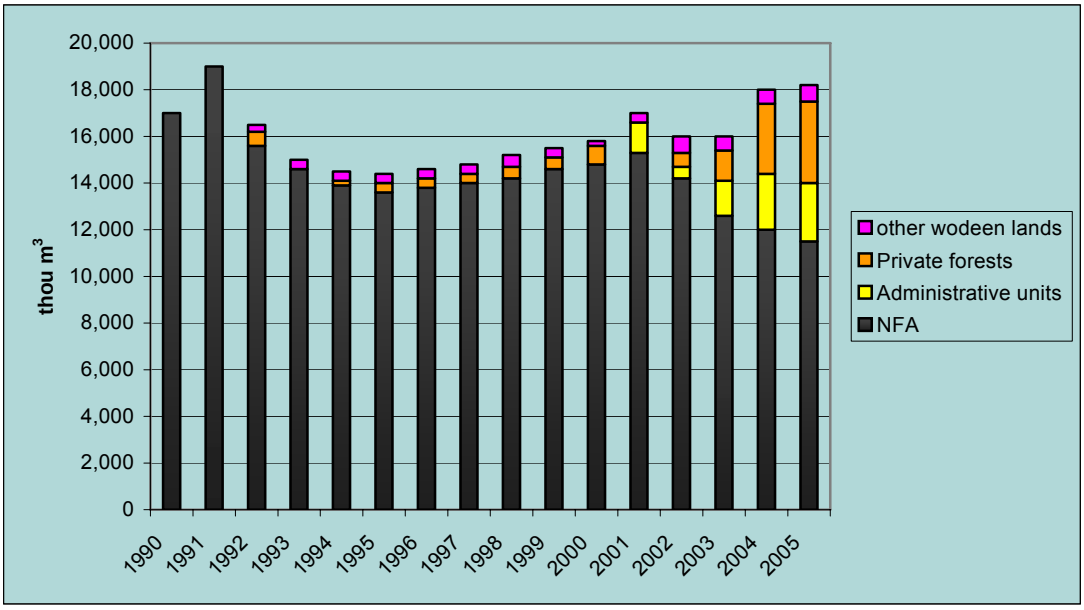
quantities) towards different categories of utilisation, e.g. industrial purposes, rural population needs, or housing for people in social assistance. A mixture of public policies and instruments are regulating now the allocation of timber resource.

Figure 1

Decreasing Volume of Timber Submitted to Auction



Source: Governmental regulations dealing with the annual allowable cut, 1990-2005.

The timber auction is compulsory when selling timber from public forests managed by the NFA (70% of Romanian forests) and from forests belonging to the municipalities (communes, towns, or 13%). It appears thus that a critical point on the raw material procurement for the whole wood processing chain is represented by the timber selling stage. The timber sales quantities, modalities and the consequent wood contracting procedures influence in a high extent the entrepreneurship, the physical development of production capacities, and the time investment horizon of the firms (Nichiforel and Bouriaud, 2004). The employment in rural area is affected directly, as far as forest harvesting operations are extensive labour users in rural area, and the harvesting is done mainly by small sized local enterprise.

Facts about the Romanian Forest Sector

Forest Ownership. The forest ownership structure was one third public, one third communal forests and one third private before the World War II and 100% public during the communist period. The restitution process started in 1990 and the forest ownership was 95% public to 5% private from 1993 to 2000. The second restitution law led to ownership structure with 70% state, 13% communes, 8% forest communities, 1% different institutions (churches, schools) and 8% private individuals. The maximum size of private forests is 10 hectares. Only half of the

forests hold by individuals are more than one hectare, the average being 1,56 ha. Most of the timber, produced in private forests, is for self-consumption.
The main timber suppliers in this ownership context remain the National Forest Administration, which manages 4443700 ha public forests, and the communal forests, which represent around 740000ha, from which 440000 ha are managed through contract by the NFA.
Forest Economy. The forest contribution to the GDP (sylviculture, logging and primary wood processing industries) accounted constantly the latest ten years for 2.4%. Timber industries, including furniture, represented during the latest ten years around 5.6% of the manufacturing industry in term of production, and 12% in term of employees. The total number of employees in forest sector in 2001 represented 5% of national labour force, furniture included.
The wood processing industry in Romania is developed in a classical wood-chain concept (logging – primary timber processing – furniture), oriented rather towards external trade than towards internal consumption. The index of intermediate consumption shows that the intensity of relationship between wood processing industry and furniture is three times higher than the intensity of relationship between the wood processing industry and the construction branch, or trade. There is a need to remark the lack of concentration of forest industry and, in the same time, the low density of trade relationship, with few purchasers, few intermediaries and one or few suppliers for raw material.

Table 1

Number of Companies from Forest Sector, in 1990 and 2002

	1990	2002	From which		
			Large	Medium	Small
Wood processing industry	107	5235	65	245	4925
Furniture	114	2965	180	1225	1560
Pulp and paper	23	434	26	119	289
Total	244	8634	271	1589	6774

Source: National Institute for Statistics, 2003.

The engine of the forest sector is the furniture industry, which was the first branch to recover in 1998 the 1990' production level. The furniture industry is strongly export-oriented. Between the years 1992 and 2002, the furniture industry annual export accounted for 70 to 86% of the value of production, and represented between 5 and 10% of the total Romanian exports. In 2003 only the furniture industry and the wood housing industry accounted for 4.8% of the total Romanian exports (Bouriaud et al., 2004).
The export regulation presents importance to understand the evolution of forest sector. Before 1989 all exports were planned and executed by a state enterprise specialized in this activity. From 1990 to 1997 it was not possible to export any rough material (logs for pulp or roundwood). Only the export of processed forest products (e.g. lumber) was allowed, on the basis of a quota system. Difficult to implement and to control, this system was replaced in 1998 by a license system, the license being required "only for statistical purposes". This opened the external market for all forest enterprises. The value of exports of wood processing industry almost doubled in only three years: from 127 million euro in 1998 to 249 million

euro in 2001. The same evolution was for the turnover, from 288 million euro in 1998 to 485 million euro in 2001 (an increase of 70%).

Forest Resource. Romania has valuable and diverse forest resources (coniferous, broadleaves, poplar) which may satisfy the forest industry needs (Table 2). After 1990 the annual allowable quota, which is established by the Government, was between 14.4 and 19.0 million m^3. With two exceptions (1996 and 2002) the annual harvests did not reach the allowed level.

Table 2

Harvested Wood Volume (Thousand m^3 – Gross Volume)

	1996	1997	1998	1999	2000	2001	2002
Harvested wood volume	14803	14509	12642	13718	14285	13410	13039
Coniferous	5751	5836	5195	5564	5346	4915	4983
Beech	4266	4263	3635	4115	4509	4260	3786
Oak	1658	1489	1276	1358	1333	1288	1295
Various hard wood species	1876	1757	1491	1588	1731	1673	1582
Various soft wood species	1252	1164	1045	1093	1366	1274	1390

Source: National Forest Administration, www.rosilva.ro, National Statistical Accounts.

The main technical restriction on harvesting comes from the accessibility of forest stands. The density of forest roads is 6.1 m/ha, which situates Romania among the latest ranked European countries. Thus, only 65% of Romanian forests are economically and technically accessible. There are 2.2 million ha of forests where the harvesting is not possible because of lack of forest roads. The forest road issue is addressed within the externally financed Forestry Development Project, launched in March 2003.

Characteristics of the Forest Resource in the Forest Directorates Suceava

Forests cover in Suceava county 444612 ha, representing half of the county total area and 7% of the total national forest area. The forest area per inhabitant is in Suceava county 0.61 ha, while the national amount is 0.28 ha per inhabitant. The structure of the ownership is dominated by state and communal ownership. Thus:

- 367441 ha (83% of Suceava forests) are public ownership managed by the NFA;
- 44.483 ha (10%) are in the communal ownership, mostly managed also by the NF;
- 27.286 ha (6%) are private forests of individuals;
- 5.402 ha (1%) are private forests of other entities (churches, forest communities).

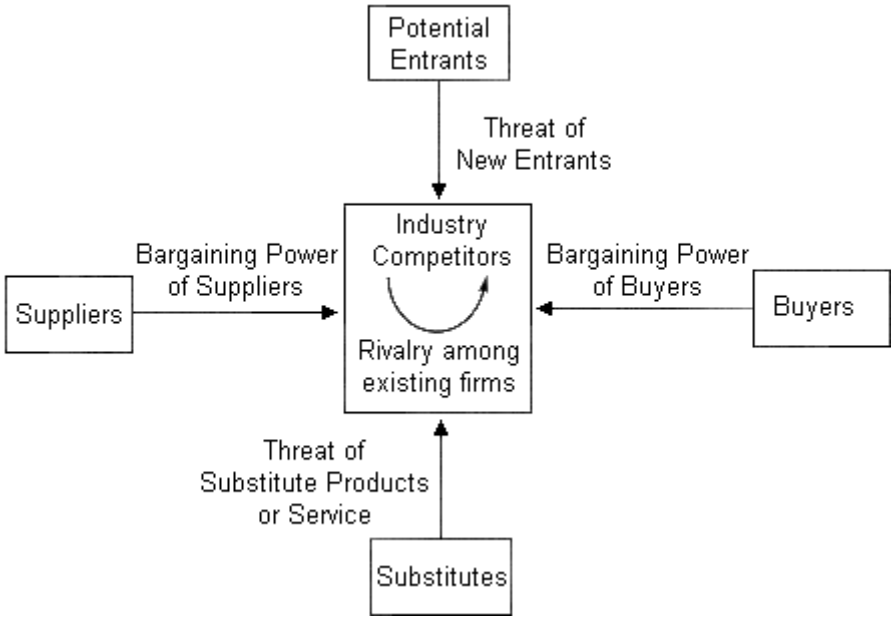
Consequent to this ownership structure, the timber supply is strongly regulated and subject at 93% to the auction procedures. The annual possibility, according to the forest management plans, is 1273400 m^3, from which 777700 m^3 represent final cuttings, 354400 m^3 thinning, and 141300 m^3 sanitation cuttings. According to the governmental regulation (Ministry Order 624/6.09.2004), the annual allowed cut for 2004 was 1360000 m^3. The governmental regulation stipulates that the timber would be sold to the economic agents (936000 m^3), delivered to the local population (304000 m^3) and given as counterpart for the construction of forest roads (120000 m^3). The final cuttings products are normally dominant on the timber supply structure, while the accidental cuttings and thinning account for 10 to 20%

of the volume sold. They were offered often as packages, to make the firms more interested in them.
Natural hazards affect also the timber supply structure. In the night of 6th to 7th March 2002 a storm produced windfalls accounting for 5.4 million m^3. The Forest Directorate Suceava had to cancel the auction which had taken place a day before (on 5th March) and to organise a new one. This time the accidental cuttings represent the majority of supply (table 2). The volume of 5.6 million windfalls was harvested at 2.3 million m^3 in 2002, 2.5 million m^3 in 2003, and 0.6 million m^3 in 2004. Thus during the years 2002 and 2003 the quantities of timber auctioned were at least doubled compared with the normal situation. To balance the extra supply in Suceava County the NFA decided to stop or reduce cuttings in all other forest directorates, which affected all the small and medium-sized enterprises (SMEs) with harvesting activities from around the country.

Method and Techniques

The method of the study is based on the hypothesis that the raw material procurement is the most important production factor. Harvesting operations are labour-extensive and seasonal; usually, establishing a harvesting firm does not require heavy investments in the Romanian context. Therefore, subsequent hypotheses are that at the present technological stage the harvesting activities do not require high qualified employees, and they are supplied with sufficient low costs labour in rural area; and that the harvesting operations resulted in no difficulties to sell products. This is supported by the fact that large companies with foreign capital which are processing timber did not involve themselves in the harvesting operations, preferring to buy it from the contractors. The exception is the Schweighofer company which won long-term contracts for harvesting 200000 m^3 in 2003 and others 50 000 m^3 in 2004 (Tobescu, 2003).
In the five forces model of Porter, the forest enterprise with harvesting operation has a stronger pressure from timber suppliers than from any other side. The pressure comes from the fact that the timber supply is hold by a quasi-monopoly, but also because the timber supply is strongly regulated by the State.
Rivalry among existing firms is important too, but in a different degree for SMEs than for large companies. Empirical evidence says that in each forest directorates (territorial units of the NFA) there are few large companies (usually one to four) which are operating each within a precise area. Theoretically, the situation of "geographically" dependant timber procurement seems to not match with the way of selling timber by auction. However, there are many explanations for why that happens: harvesting a tract is a more successful operation if there are enough roads in the area, if they are repaired, if the local forest officers are also cooperating persons, if there are trustfully local contractors to assure the timber guarding against theft, if the sawmill is easy to reach and so on. When compete for a tract, the firm would better consider a tract from the area where it is usually operating than a tract situated at hundred km, where the firm has any local connections. Thus, the most efficient rule of game for the large firms is to "share" the territory from which the timber is coming instead competing each other. Of course, there are exceptions from the rule; it might happen on the "borders" of the area where the firm locates the activities.

Figure 2
Five Forces Model of Porter: Harvesting Firms are Subject of Pressures by Supply



Source: http://www.valuebasedmanagement.net/methods_porter_five_forces.html.

Regarding the SMEs, their situation is completely different. In a sample of around 2000 companies with limited liability and others doing harvesting operations, 40% of them are doing only harvesting and trade of timber cut, the others are going into processing as well (National Institute of Statistics, 2003). They are dependent on the larger companies for selling harvested timber, but they supply also timber for the local population. They have even fewer possibilities to change the area where they are located the greater the competition between them is. Some forestry experts agreed that it is really difficult for SMEs to survive on the market, and that it happens so for part of them through different strategies: avoid tax payment; operate on the black and grey labour market; free-ride the opportunities offered by harvesting in a tract located next to a tract harvested by a large company, which is able to ensure the protection against timber thefts. Empirical research is needed to prove such anecdotic reporting.

Results of the Analyse on Timber Demand and Supply

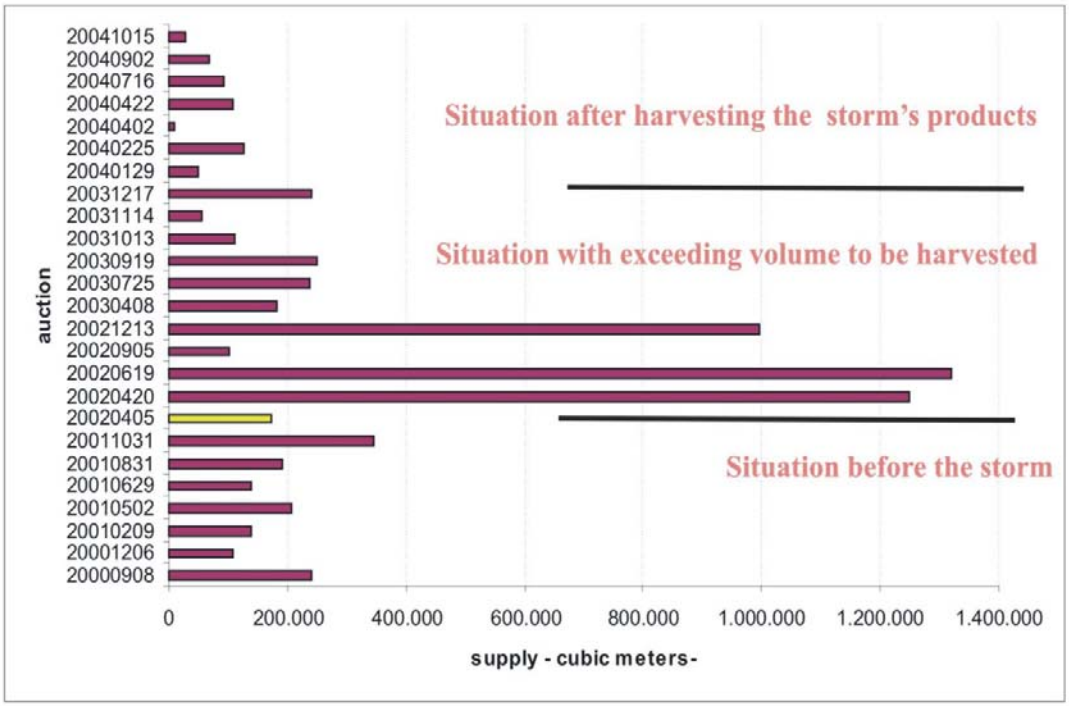
The Suceava timber market was already subject of research in 1994-1996, when the Harvard Institute for International Development studied the Suceava auction system (Milescu and Marocico, 1995). In 2003 the IRIS Center of the University of Maryland commissioned a new study for the World Bank on the same area. A Working Paper is dedicated to the detection of collusion in the timber auctions in Suceava and in Neamt County (Saphores et al., 2004).
The present study proceeds to a structural analysis of the demand and supply at the level of the Forest Directorate Suceava. We analyzed data from a number of 25

auctions organized by the local branch of the NFA between September 2000 and October 2004. First we compared the demand and supply in terms of volumes of timber available, then we analysed the number of firms participating on each auction, the quantities auctioned, and, finally, the volumes remained unsold after the auction (the exceeding supply). We analyzed only structural factors of demand and supply, namely quantities, number of firms and their capacities of harvesting. We did not emphasize the price aspect, or the aspect of profitability of the timber sales for the producer, which were the object of previous studies (Nichiforel and Horodnic, 2002).

The Figure 3 presents the situation of supply, putting in evidence the situation before the storm, during the exceeding volume of windfalls, and after the harvesting of this volume. The yellow bar (auction 20020405) represents the auction which took place a day before the storm and which was cancelled before the contracts were signed. The supply is lower after the storm than before that.

Figure 3

The Supply for Analysed Auctions



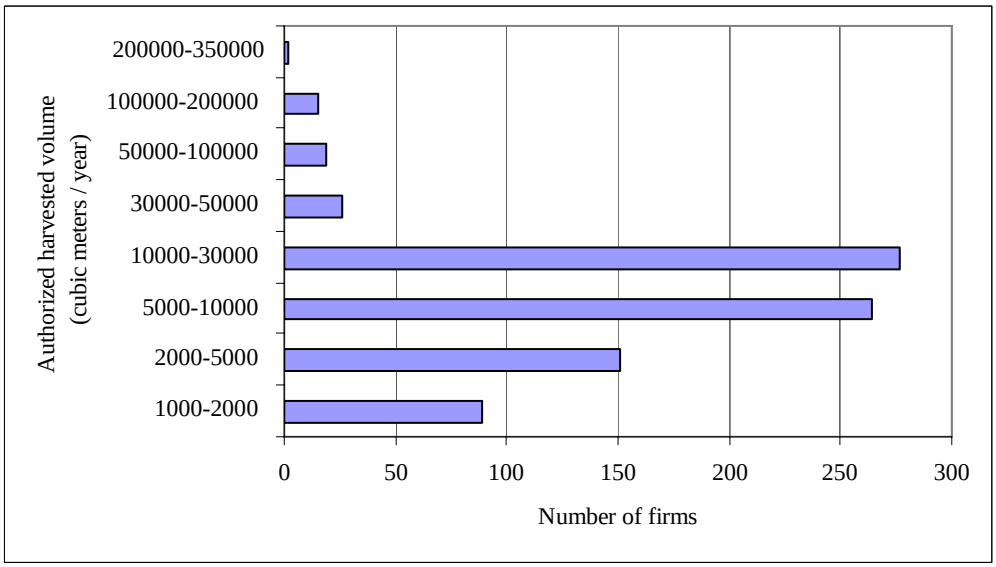
Source: Forest Directorate Suceava

The demand is expressed as the total volume for which the firms are authorised. The authorised volume represents the physical and legal capacity of activity. Physical, because the firm is authorised to a certain volume after proving that he has the technical and human resources for annually harvest a certain volume. The volume authorised is then related with the physical production capacity of the firm. Legal, because in any case, the firm can not auction more than the volume for

which it was authorised. The volume authorised is one of the legal limit of the firm participation to the auction.
Figure 4 presents the structure of demand as number of firms authorised to harvest a certain volume per year. In 2003 there are 15 firms which have the possibility to harvest annually between 100000 and 200000 m^3. Two firms can harvest even 350000 m^3 annually. However, 60% of the firms (or around 500 firms) recorded by the Forest Directorate Suceava can harvest annually less than 30000 m^3. The interesting point here is that the total authorised volume for the firms recorded by the Forest Directorate Suceava is 10,8 million m^3, which is the equivalent of the volume of wood available for industrial purposes at the national level! This statement leads to the conclusion that the demand for industrial timber is important, as far as the harvesting capacities are exceeding by far the supply. The factor varies from four (the high supply caused by the windfalls) to ten.

Figure 4

Number of Firms Authorized for a Certain Volume per Year

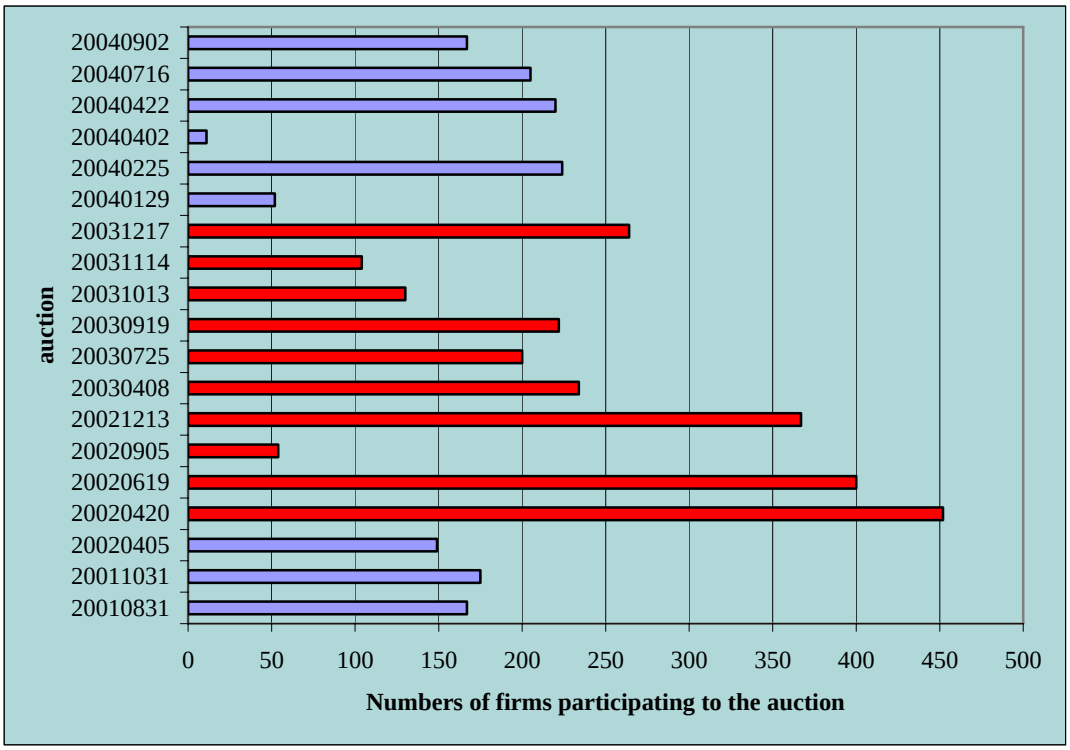


Source: Forest Directorate Suceava.

The relationship between demand and supply was analysed as number of firms attempting the auction procedures (Figure 5). The participation means only that the firm attempted the auction procedure, not that the firm auctioned or gained a forest tract. While before the storm the number of firms participating in the auction was comprised between 130 and 160, on the storm products their number sharply increased (from the 128 to the auction which was cancelled to 450 for the first auction on storm products). Their number remains higher than before for the latest three auctions hold this year (2004), knowing that the supply was only half of that before the storm. The increasing number of firms is due partly to the creation of new firms for harvesting, and partly to the arrival of the firms from others counties.

Figure 5

Number of Firms Attempting the Auctions



Source: Forest Directorate Suceava

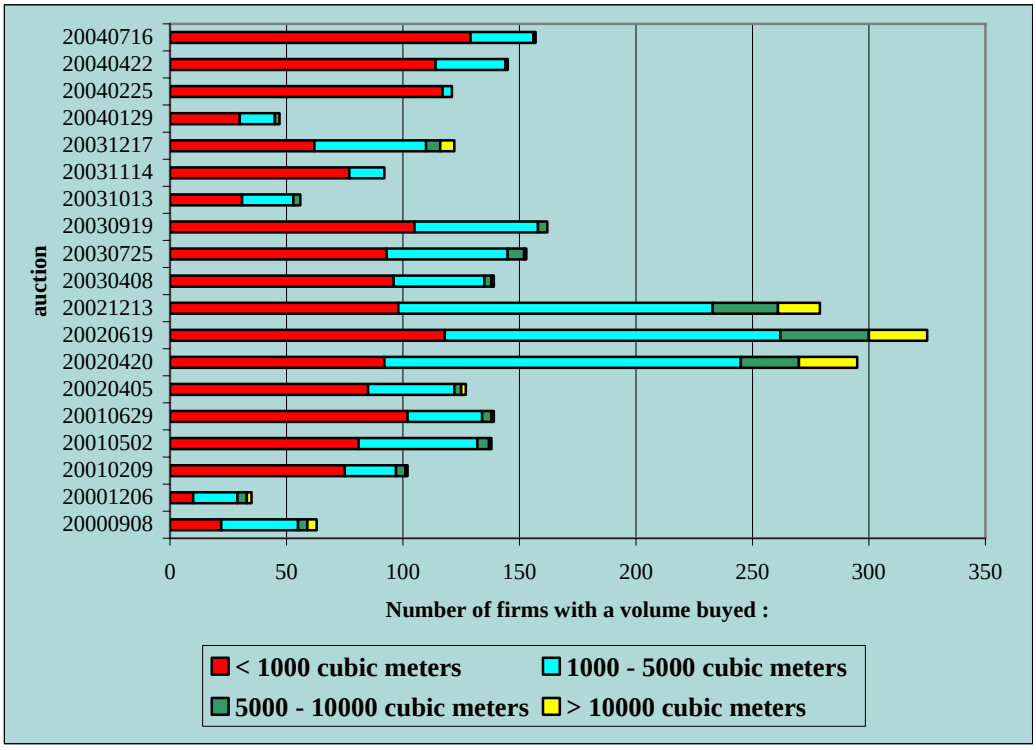
In entering the auction process, the firms can win one or several tracts, accumulating thus a certain amount of timber. The timber is bought on stand, and enters in the firm ownership once the firm pays the price. Figure 6 shows how many firms auctioned a certain quantity of timber, which is the total volume of tracts that the firm won in the auction procedures. Only 30 firms bought between 1000 and 5000 m^3 in the auctions organised during the latest year. In the period with storm products, their number was much higher, between 50 and 150. Figure 6 shows that the majority of the firms auctioned after the storm period less than 1000 m^3. Their number was 130 at the latest auction analysed (July 2004), or twice compared with the period before the storm. The high number of transactions per firm inferior to 1000 m^3 indicates that: 1) these firms are very small size, 2) the firms, irrespective to their size, are still working on the volumes bought in the previous years. However, when putting together figure 5 and 6, it appears as much plausible the idea that the small quantities of transactions per firms are due to the small size of firms, not to their over-occupation with timber harvesting from the previous years. Therefore, the structure of demand after the storm period seems to be much more fragmented and small-sized than before.

A second conclusion of these figures supports the idea already formulated that the extra supply provided by the storm product attracted firms from outside the

Suceava County, and these firms coming in were usually of medium and large size (over 1000 m^3 capacity per year). We expect that these firms would leave the area of Forest Directorates Suceava when they will finish to harvest the tracts bought in the latest two years.

Figure 6

The Number of Firms Buying Certain Amount of Timber



Source: Forest Directorate Suceava

The situation of auctions show also the fact that in some cases, e.g. auction from 06.12.2000, the number of firm participating to the auction and of firms buying timber is very small, which confirms opinions presented in the literature (Dragoi, 2000) that there is a territorial concentration of large firms, which are able to influence the decisions of the small-size agents (tendency to "oligopsony" situation).

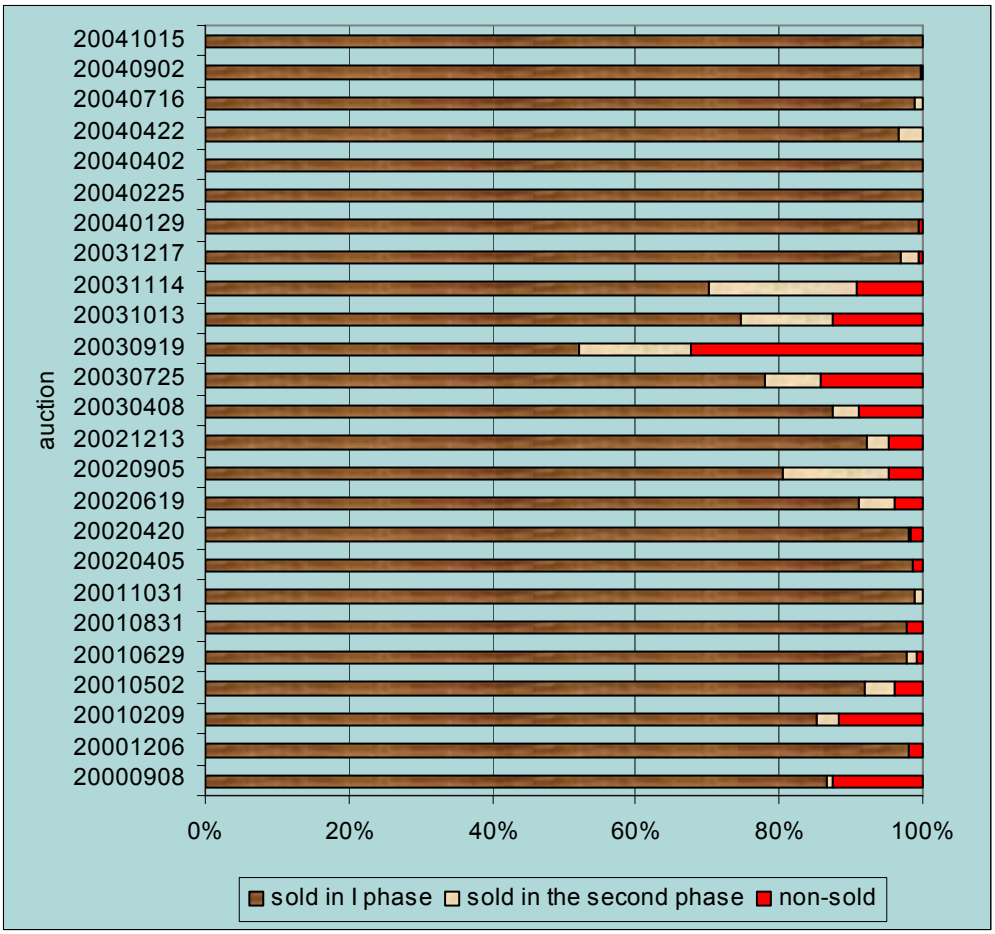
Finally, the relationship between the demand and supply is analyzed in term of residual supply (what remains unsold after the auction procedures). The system of auctions involves that the volumes remained unsold in the first phase must be auctioned again in the auction in a second phase, organised only few days after the first phase. The two phases are considered to be part of the same auction. Only after the two phases the timber remained is considered "unsold".

Figure 7 shows a trend which is the logical consequence of the disequilibrium between the demand and supply at the level of the Suceava County. Before the storm a quantity of timber representing between 3 and 15% of the total volume

remained usually unsold. In 2003 the unsold quantities were higher, because the firms were concentrating on harvesting what they bought already in 2002. Nevertheless, once the exceeding volume was evacuated from the forests, the unsold volume disappeared. In all auctions organised in 2004, the whole volume was sold, and often (four cases on seven) all the timber was sold from the first phase of the auction.

Figure 7

The Evolution of Timber Remained Unsold at the Auctions



Source: Forest Directorate Suceava

Why this fact must be a concern for the firm development? Because in a normal timber market the unsold volume represents the part of supply which is not profitable for the agent to harvest, because of too high costs of harvesting (located in a remote area; on the slope; no forest roads; technical difficulties, etc.), or because of too low quality of timber (too thin; too damaged by the windfall; subject to diseases and pest; not interesting on the market, etc.). In a normal situation this unsold timber was cut with financial loses by the timber supplier (the NFA).

Logically, these financial loses would be now on the private agents side. This factor, which cooperates with the decreased supply and increased competition, may suggests that a strong fight for survival was launched amongst the firms with harvesting activities located in the area managed by the Forest Directorate Suceava. The fact that all the timber is sold proves that:

- there is a great competition amongst firms, because their number increased by 25% compared to the situation existing two years before, while the supply decreased by 50%;
- this competition leads to a strategy which has nothing in common with that of obtaining profit. The firms behaviour now is to keep their access on the raw material procurement, and to keep their people and machineries on work, and do not stop their harvesting activities because the track they accessed are not economically profitable.

Conclusions

The results of the analysis of the demand and supply at the level of the Forest Directorate Suceava confirm that there is a trend of territorial concentration of large firms, which are able to influence the decisions of the small-size agents. More research is needed to clarify the relationship between the first chain of wood processing industry, which is the harvesting, and the wood processors; and to clarify the networking amongst the firms from the wood processing industry. Does the net separation between the harvesting activities (forest contractors) and the primary wood processors represent an economic efficient situation? Is this situation reflecting an economic utilisation of resources to reduce the transaction costs? These are generally acknowledged amongst large firm that the harvesting activities involves high transaction costs, particularly when is about aggregating supply from small tracts.

Second, the evolution of demand and supply before, during and after the storm event was an opportunity to study the reaction of entrepreneurs to different supply context. It appears that after the storm period the demand is much more fragmented and small-sized. The extra supply provided by the storm product attracted firms from outside the Suceava County, and these firms coming in were usually of medium and large size (over 1000 m^3 capacity per year). The present study launches the hypothesis of territorial dependency of firms with harvesting activities, but this requires further investigation, which can be done through enquires on a representative sample.

Third, some conclusions come out from the high competition which leads to apparently irrational choice of harvesting economic inefficient tracts instead renounce of harvesting activities. Several hypotheses may be formulated to explain behaviour in contradiction with the basic principles of economics that the agent's utility function is to obtain profit. One of the hypotheses relays on the lack of information: the entrepreneurs did not have the possibility to anticipate and to realise that the raw material available may have so large fluctuations on short run. Then, they participated in the auctions and they bought tracts because they did not have information on what would be the raw material flow in the next years (lack of strategic perspective). A second hypothesis considers that the activity in the forest sector is part of the rural entrepreneurs' risk portfolio. In the rural area those

starting business in the last decade did not specialised themselves in one area, but usually had at the same time a small mill, a shop, a restaurant or hotel, some farming activities, processing milk products, etc. In a “risk aversion attitude”, the harvesting activities are kept as an “open option”, despite the fact that this potentially lowers the general profit and enhances difficulties to control the money flow and the directions of the internal compensation. Finally, the hypothesis of false zero profit should be acknowledged too. The anecdotic evidence or statements exists on the small firms’ possibilities to improve their profit in eluding tax, using the black labour, practicing the illegal cutting or illegal timber processing, payments of bribes, etc. Again, research is needed to clarify these hypotheses. It might be possible that in the next two years the number of firms would decrease, as well as the level of competition. Nevertheless, it is still interesting to clarify which were the managers’ motivations when deciding to continue or not an activity, for which the raw material was drastically diminishing.

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