THE AUSTRIAN SAWMILL INDUSTRY -- SOME POSSIBLE FUTURES

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FOREWORD

The objective of the Forest Sector Project at IIASA is to study long-term development alternatives for the forest sector on a global basis. The emphasis in the Project is on issues of major relevance to industrial and governmental policy makers in different regions of the world who are responsible for forestry policy, forest industrial strategy, and related trade policies.

The key elements of structural change in the forest industry are related to a variety of issues concerning demand, supply, and international trade of wood products. Such issues include the development of the global economy and population, new wood products and substitution for wood products, future supply of roundwood and alternative fiber sources, technology development for forestry and industry, pollution regulations, cost competitiveness, tariffs and non-tariff trade barriers, etc. The aim of the Project is to analyze the consequences of future expectations and assumptions concerning such substantive issues.

The research program of the Project includes an aggregated analysis of long-term development of international trade in wood products, and thereby analysis of the development of wood resources, forest industrial production and demand in different world regions. The other main research activity is a detailed analysis of the forest sector in individual countries. Research on these mutually supporting topics is carried out simultaneously in collaboration between IIASA and the collaborating institutions of the Project. This article represents parts of the study concerning long-term development of the Austrian forest sector.

Markku Kallio
Project Leader
Forest Sector Project

ABSTRACT

The Austrian forest industry consumed about 14.5 million m^3/u.b. industrial roundwood in 1980 to compare with a total domestic cutting of 13 million m^3/u.b. The dominating primary manufacturer is the sawmilling industry which in 1980 consumed about 70% of the total industrial wood consumption. About 65% of the sawnwood production is exported.

In this paper, four scenarios are presented for the Austrian saw mills. These scenarios show that future problems such as (i) overcapacity; (ii) insufficient supply of wood raw material and (iii) low profitability -- may arise. These problems could be solved by (1) intensified marketing, (2) intensified domestic cutting, (3) long-term import agreements for wood, and (4) a continued modernization of the industry.

CONTENTS

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INTRODUCTION

A long-term prototype model of a national forest sector has been developed as a part of IIASA's Forest Sector Project. The prototype model consists of two symmetric competing forest sectors (Lönnstedt, 1983a,b). Each sector consists of eight modules: Demand of wood products, product market, forest industry, roundwood market, forest management, inventory of standing volume, construction sector and regulation of the forest sector (Figure 1). The model is intended to be used for long-term policy analysis by decision makers concerned about possible future of the forest sector.

A team of researchers at the Austrian Agricultural University are implementing IIASA's forest sector protoytype model; and at the same time, an advisory group has been established to guide the work and to

Studied country Competing countries

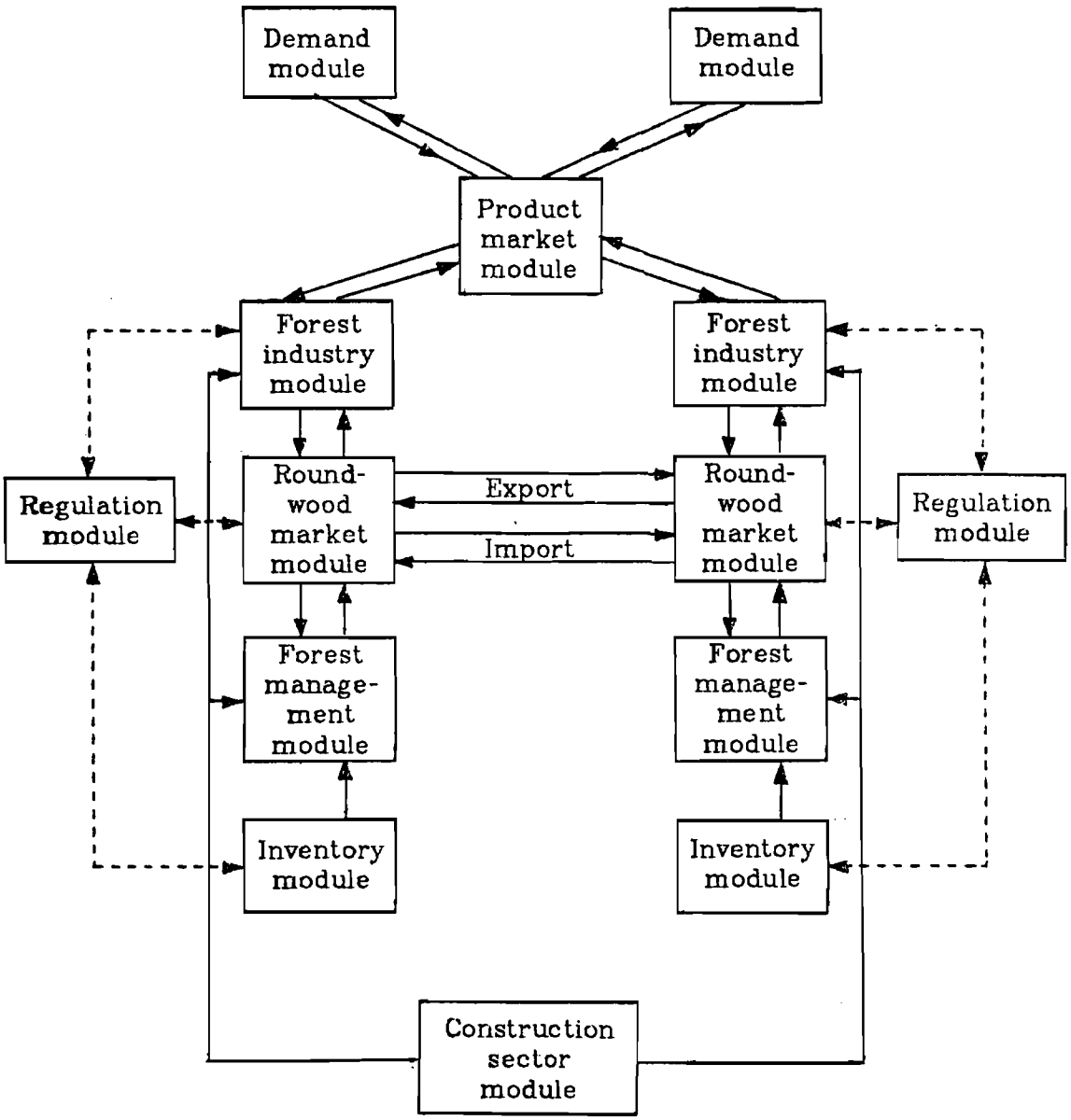

Figure 1. Outline of the prototype model used on the forest sector under investigation and competing forest sectors. The linkage between the modules consists essentially of price and quantity information. From the construction sector module new capacity is received. The regulation module specifies quantitative restrictions (marked by dotted lines). As exogenous variables are GDP, size of population, prices of substitutes, exchange rates, and prices of input factors other than wood and technological development treated.

help with the implementation. A first meeting with the reference group took place at IIASA in March 1983 (Appendix).

The purpose of this paper is to present the results achieved so far in such a way that it will stimulate the discussion about the direction of the work and help the implementation of future results. Up till now, the work has been concentrated on data collection and implementation of the prototype model. The existing version of an Austrian forest sector model is a preliminary one where the intention is that the Austrian research team shall continue on its own to elaborate the model. Compared with the prototype model, no competing forest sector exists which means that prices and export and import of wood products and roundwood are treated as exogenous variables. Also the module "Demand of Forest Industrial Products" is not yet existing. It is replaced by exogenous data taken from from an Austrian study about wood demand and supply from 1980 to 2000 (Oesterreichisches Holzforschungsinstitut, 1981). Many important feedback mechanisms are therefore missing. Another difference is that the structure of the roundwood market module is simplified -- stumpage share is defined as a linear function of industrial gross margin and has been remarkably stable during the last 20 years. No regulation is considered to take place. It is intended that three industrial branches will be represented in the Austrian forest sector model: saw-milling, pulp industry, and wood-based panel industry. At the moment, however, only sawmilling industry is represented in detail in this first version of the model. The other two branches only appear as consumers of roundwood; their consumption also has been taken exogenously.

As in the prototype model, we treated forestry and forest industry (in this case sawmills) as two single blocks, despite the fact that there are more than 200.000 forest owners and more than 2000 sawmills in Austria. As far as facts of the Austrian forest sector are presented here it must be mentioned that the degree of details is kept to a minimum. Only an understanding of this very first form of the model should be reached.

The paper consists of three sections. In the first, some data about the Austrian forest sector are presented. In the second chapter, four policy runs with the model are presented and discussed. The last chapter presents some conclusions based on the model runs.

1. THE AUSTRIAN FOREST SECTOR

1.1 Production of Forest Products

Figure 2 gives an overview of the Austrian production of bulk products such as sawnwood, pulp and wood-based panels. Some conclusions which can be drawn are:

1. The sawnwood production is dominating -- about 65% of the total production (in tons) at the end of the '70s and the beginning of the '80s. Compared with the middle of the '60s, this means a decrease down from about 75%. (Bundesministerium für Land- und Forstwirtschaft 1965-1981).
2. Between the middle of the '60s and the beginning of the '80s, the production of athree bulk products has increased steadily;

sawnwood by 2%, pulp by 3,5% and panels by almost 10% per year (Bundesministerium für Land- und Forstwirtschaft 1965-1981).

3. Sawnwood production is rather large (250%); it is, for example, larger than the Italian, but smaller than the Swedish (60%). Pulp production is almost twice as high as in Italy and only 15% of the Swedish production. Wood based panels show a different picture. The Austrian production is 54% of the Italian and 9% of the Swedish. Compared to Hungary as the nearest neighbor in the East, production figures in Austria are 5 times higher for sawnwood, 14 times for pulp and 4 times for panels (FAO, 1983).

1.2 Trade with forest products

Figure 3 shows how important export is for the Austrian sawmills. Export measured as a share of total sawnwood production corresponds to about 65% (Bundesholzwirtschaftsrat 1980). Main importers of Austrian sawnwood are Italy (approximately 60% of Austrian exports); the Federal Republic of Germany (approximately 17%); and Middle East countries (approximately 9%) (Bundesholzwirtschaftsrat 1970-1980). Export has increased a little more rapid than domestic consumption of sawnwood. From Figure 3, we can also see a clear cyclical behavior. In the beginning of the studied period, the fluctuations in export and domestic consumption counteracts each other. Import of sawnwood to Austria still accounts for quite a small volume, but has undergone a remarkable increase, almost 18% per year for the studied period. Part of the import, mainly from Eastern European countries, is re-exported.

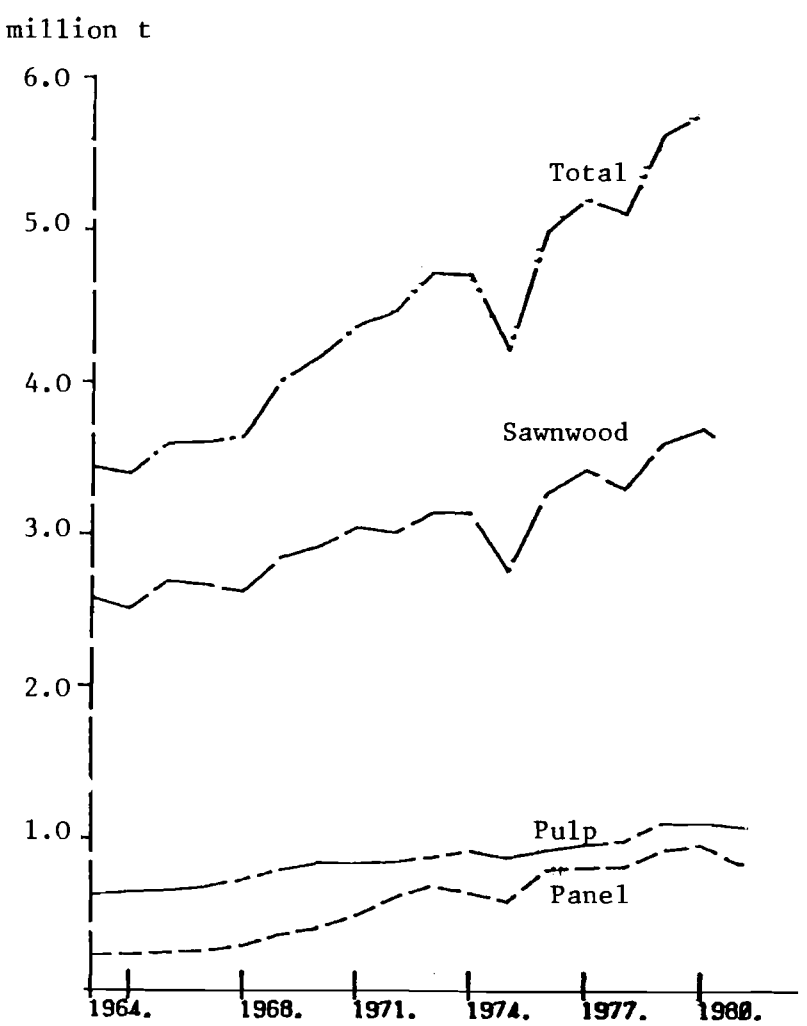

Figure 2. Production in tons per year of sawnwood, pulp, and wood-based panels (fiberboard, plywood and blackboard, particleboard) in Austria 1964-1981. (Source: BHWR, 1980).

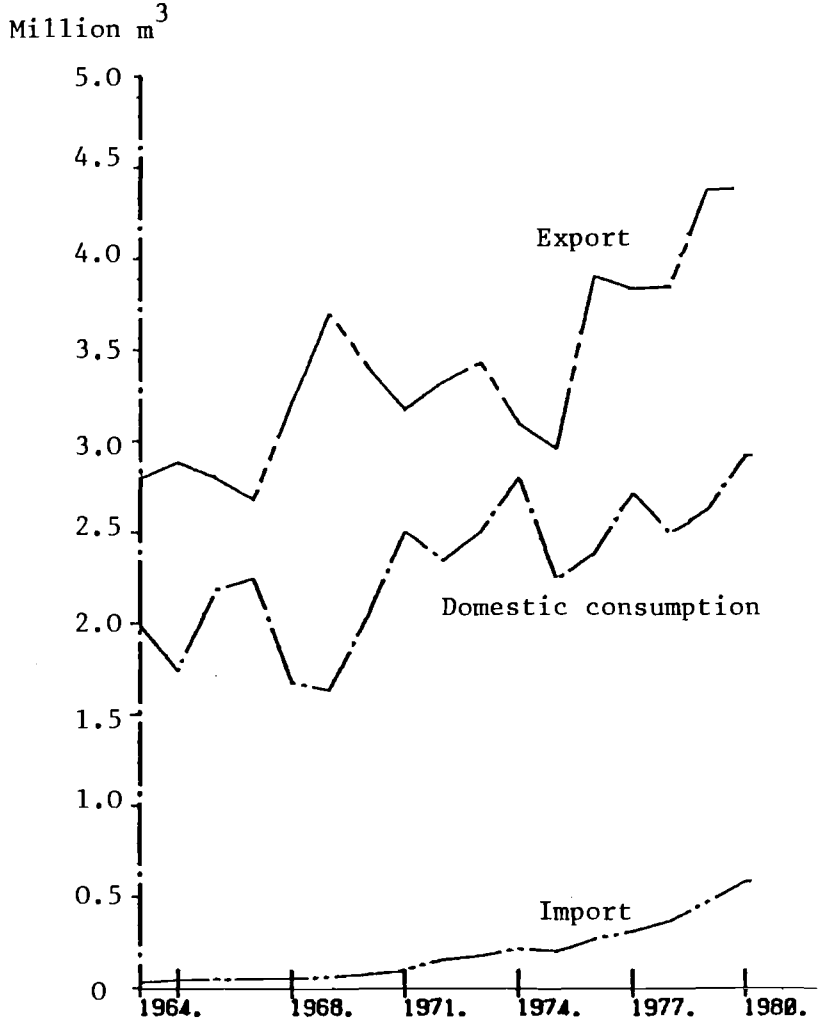

Figure 3. Domestic consumption, export and import in m^3 per year of sawnwood 1964-1980. (Source: BHWR, 1980)

Wood Raw Material

Figure 4 presents the wood raw material base for the Austrian forest industry. Some conclusions are:

1. Removals are less than total increment* (and thus standing volume and increment are increasing). The standing volume has increased from 752 million m^3 o.b. in 1964 to 825 m^3 o.b. in 1980. The forest area in production has slightly decreased (3.125 million ha 1980) and the total forest area slightly increased (3.780 million ha 1980) (Forstliche Bundesversuchsanstalt, 1982).
2. Import of roundwood has increased with almost 9% per year compared with just 1% for removals. In the middle of the '60s, one-twentieth of the total Austrian demand of wood was satisfied through import compared with one-fifth in 1980 (Bundesholzwirtschaftsrat, 1980). Most part of the import comes from Eastern European countries, especially from Czechoslovakia.
3. Export of roundwood has increased by 3% per year (Bundesholzwirtschaftsrat, 1980).
4. Roundwood from non-forest land and re-use of wood is quite stable and amounts to about 2 million m^3 (about 15% of the total domestic consumption of roundwood). (Bundesholzwirtschatsrat, 1980).

* To make the units, comparable increment has been reduced from solid cubic meters o.b. to solid cubic meters u.b. and reduced by losses (all in all a reduction of 20%).

The total Austrian roundwood consumption defined as gross felling plus wood from other sources plus imports minus exports amounted in 1980 to about 18.8 million m^3 u.b. Compared with 1964, (13.7 million m^3 u.b.) this means an annual average increase of about 2% (Figure 5). The industrial share is slightly less than 80% and increasing (Bundesholzwirtschaftsrat, 1980).

Income and Costs

The economy and the cash flow are interesting to study when it comes to making a judgement about how prosperous a sector is. In the following, we will try to give some data for the sawmills (Figure 6). The incomes for sawmills consist of income from sold sawnwood and sold residues. Using domestic prices for sawnwood and adding income for sold residues the latter correspond to about 7% of the total income (Bundesholzwirtschaftsrat, 1980; Bundesministerium für Land- und Forstwirtschaft, 1965-1981). One can suspect that this "extra" income is a quite important cash flow generator for the sawmills. Cost of logging including transportation to forest street is about 30% of the delivery price of sawlogs (Frauendorfer, 1974-1981). The stumpage share has been remarkably stable over time. Multiplying domestic sawlog prices with conversion quotients gives an estimate of the wood raw material cost for the sawmill of about 60-70% per sold m^3 sawnwood including sold residues. This leaves only about 30-40% for other costs and profit. If we assume that gross margin as a share of total income per sold m^3 sawnwood corresponds to 5-15% depending on the business cycle this leaves 15-35% for processing costs and costs for other input factors than wood

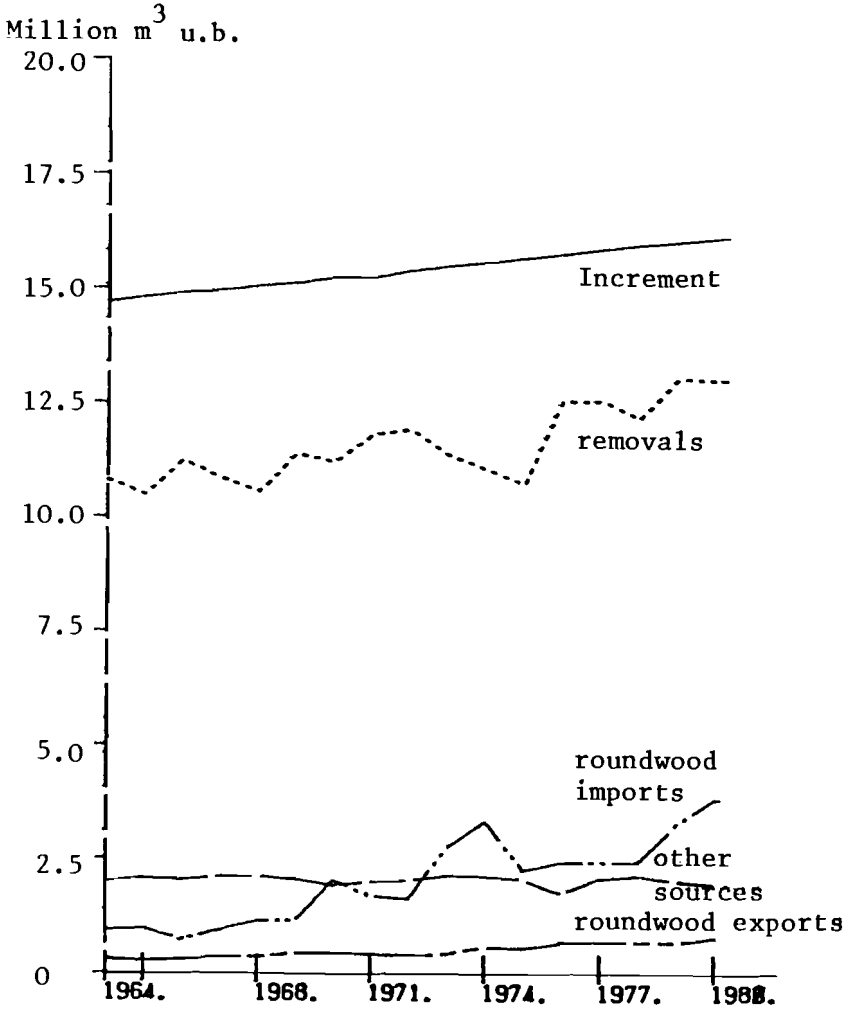

Figure 4. Total inrement, removals, import and export of roundwood and wood from non-forest land in m^3 per yer 1964-1980. (Source: BHWR, 1980; FBVA, 1982)

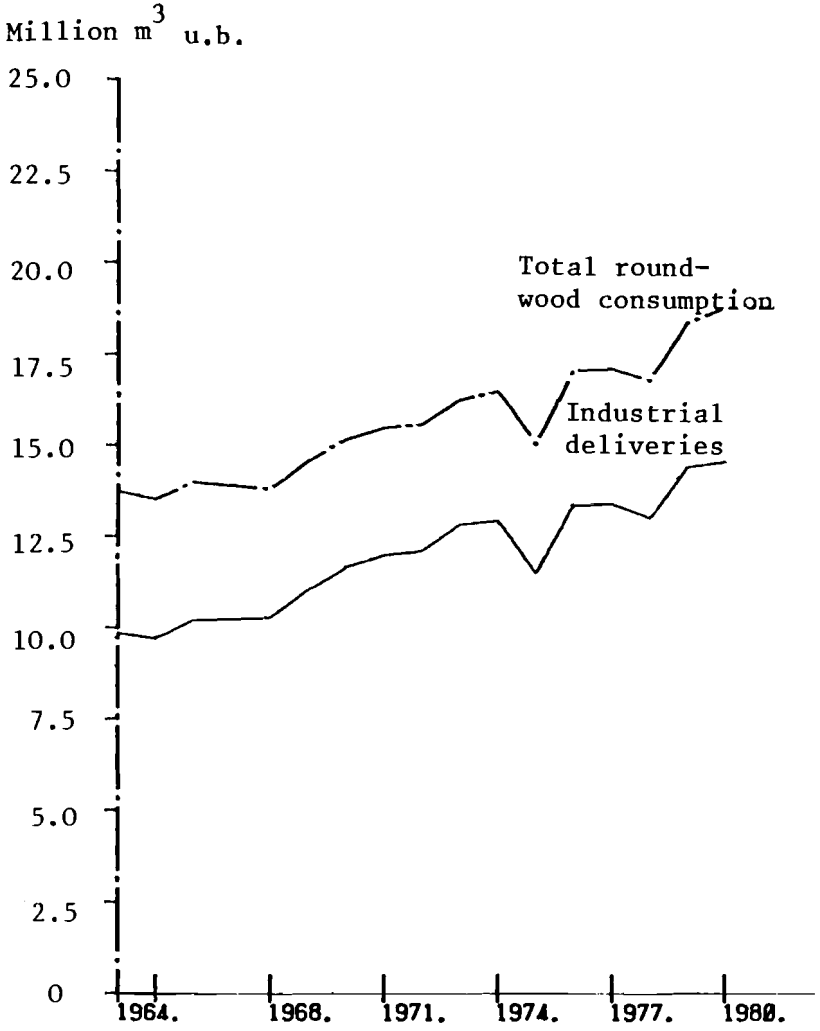

Figure 5. Total roundwood consumption and deliveries to the industry in m^3 per year 1964-1980. (Source: BHWR, 1980)

(compare with Deringer, 1980 and 1981).

It is difficult to get data about the cash flow of the sawmills. But let us give an example. If gross profit per sold m^3 sawnwood including income from sold residues 1980 was about 300 shilling; interest rates, taxes and dividends could have amounted to less than 100 shilling. To the remaining 200 shilling, new loans should be added, repayment of old loans should be subtracted. Usually this means a net increase. But if we just multiply our 200 shilling with the sold volume in 1980, this gives about 1.3 billion shilling for investments inside and outside the sector Bodner (1981) estimates almost the same figure.

2. SCENARIOS FOR THE AUSTRIAN SAWMILL INDUSTRY

Some concerns about the Austrian forest sector and perhaps especially for the export oriented sawmill sector as it was expressed during the reference meeting were: 1) The future wood raw material base for the industry; 2) Cost competitiveness. The concern for the wood raw material base is explained by an increasing industrial capacity based on import. What will happen if there is a drop in the import in the future? Cost competitiveness has among other things to do with the price development compared with the factor cost development in Austria relative to competing countries as Finland and Sweden. One way to tackle those problems could be through financial means. The business is idea to increase investments in forest industry and forestry. in order to get more modern equipment and increased productivity. Investments in silvicultural activities will affect the future domestic wood raw material base.

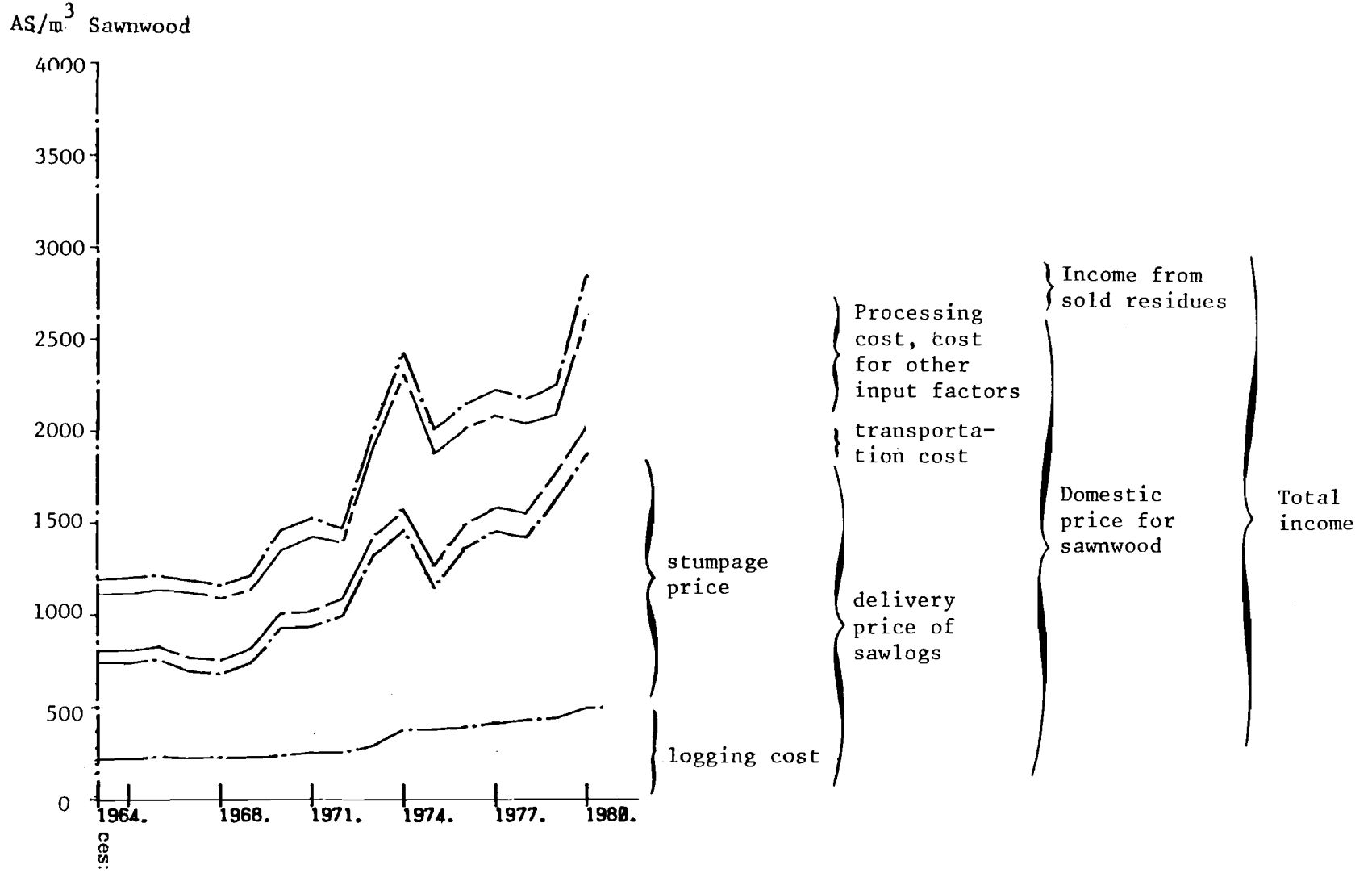

Figure 6. Calculated income and cost structure for Austrian sawmills (Sources: BHWR, 1980; BMLF, 1965-1981; Deringer, 1980 and 1981).

From this background four different long-term scenarios for the Austrian forest sector are presented in the text to follow. The first one is based on exogenous data and assumptions that historical trends will continue (exogenous data were taken from Oesterreichisches Holzforschungsinstitut, 1981). In the second scenario sawlog import is assumed to decrease dramatically. In the third scenario the Austrian factor costs develop more rapid than the sawnwood prices. In the fourth and last scenario the financial condition for the forest sector is improved by decreased taxes.

In the basic scenario domestic consumption and import of sawnwood is expected to increase up till the end of this century with about 0.5% per year. The prospects for the export is assumed to be slightly better: 1.4% per year. However, import of sawlogs is expected to drop with 1.3% per year as an average. This may cause some problems for supplying the sawmills with wood raw material. Export of sawlogs is expected to remain almost unchanged (Oesterreichisches Holzforschungsinstitut, 1981).

We have assumed that the historical trends will continue for the development of prices, factor costs and productivity. Prices of sawnwood and imported sawlogs are in the model as an average increasing with 4.2% per year. Factor costs are assumed to be increasing with 8.7% per year as an average. Productivity and efficiency in use of other input factors other than labor and wood is assumed to increase by 4.5% per year as an average. This gives an inflation rate of about 4% per year. Consumption of wood for pulp, wood-based panels and fuelwood is assumed to increase with 0.5% per year.

2.1 A Reference Scenario

Figure 7 shows the historical development until 1980 and from then on a scenario based on the model and made assumptions. Two main observations can be made: 1) The model scenario generates a decade with excess supply starting from the beginning of the 1980's; 2) Starting from the same time, there is a downward trend for the gross margin. The main explanation for this model scenario with excess supply is assumptions about: a) reduced demand increase for sawnwood from more than 2% per year to less than 1%; and b) delay in adaptation of the sawmilling capacity. Preparation, decision and building time for the new sawmilling capacity is put to three years in the model. This means that a decision taken for increasing capacity when the market situation looked good may be realized when the situation has changed. The life time of the sawmilling capacity is put to 20 years in the model.

The utilization of the sawmilling capacity is in reality rather flexible. It is easier than for the pulp and paper industry to change the utilization of the capacity through varying the working hours per day. Small sawmills can also, if they are connected to a farm or some other operation be put aside or brought into use when the market is good. The model capacity should be looked at as potential capacity. The actual production is therefore much closer to actual demand.

One reason for the decreasing gross margin in the model is the increasing export share of total production. Domestic and export prices are assumed to be the same in the model. However, the transportation and insurance costs are in the model higher for export sale than for domestic sale. Another reason is that decreased investment means a

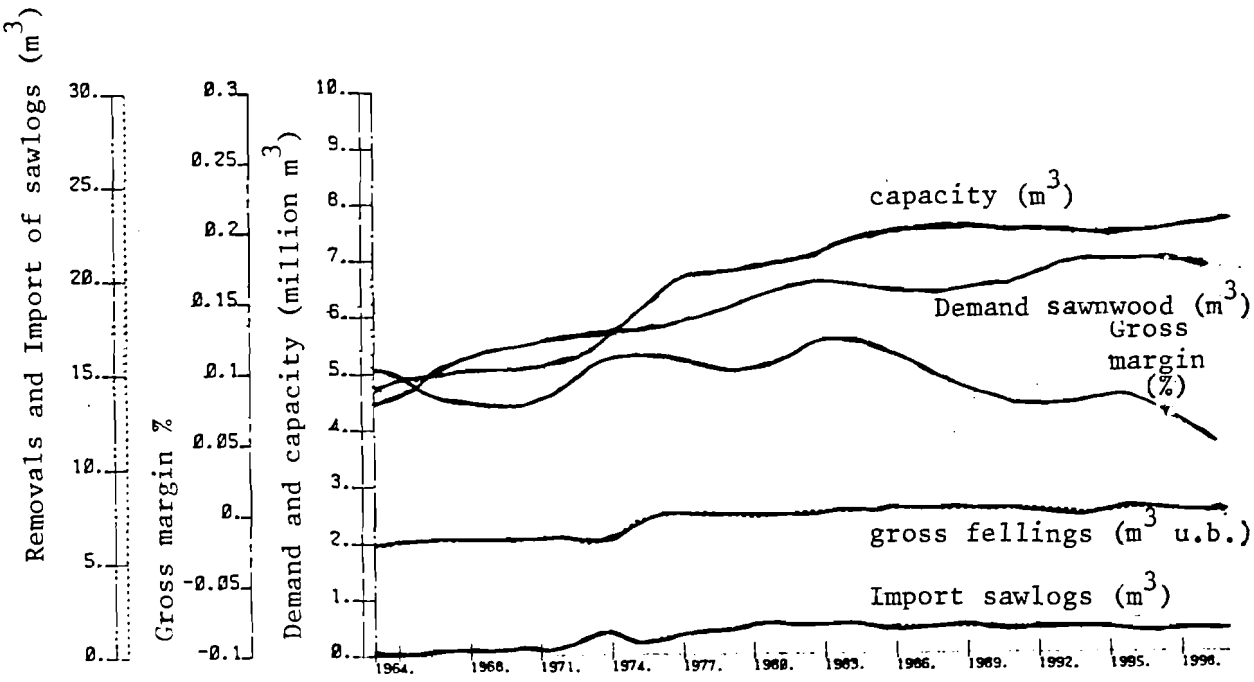

Figure 7. A reference scenario for the Austrian forest sector.

slower introduction of new capacity which will affect processing cost per m^3 sawnwood. However, this effect will be marginal because of the small share for processing cost compared with costs for input factors such as sawlogs.

2.2 A Scenario with Decreasing Import of Wood

The assumptions for this scenario is the same as for the reference scenario except for a substantial decrease in import of sawlogs after 1984. In this scenario the situation with excess supply will be followed by a situation with *excess demand* due to the lack of wood raw material (Figure 8). The sawmills will in this case have to decrease their capacity down to a level that fits the domestic gross felling volume. This will

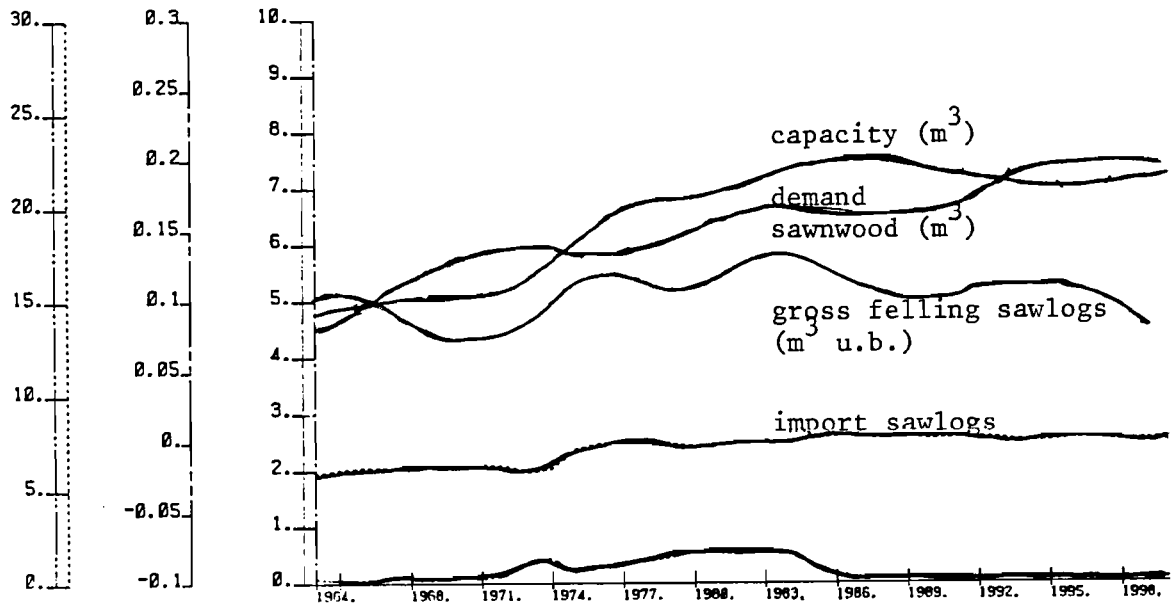

Figure 8. A scenario with substantial decrease of sawlogs.

especially affect rural communities because of the local importance of the sawmill sector. Export markets for sawnwood must be given up or the import of sawnwood increased.

2.3 A Scenario with Quick Factor Cost Increase

In the reference scenario, the total variable cost for producing one cubic meter sawnwood increased with about the same rate as the product price. The assumption in this scenario is that the factor costs after 1984 increases with about 9.7% per year instead of about 8.7% as in the reference scenario. The price is as in the reference scenario. Of course, the result will be a declining trend for the profit. As can be seen from Figure 9, this is exactly what happens in the model. The decrease in

sawmilling capacity in the model has this time economical reasons and is not caused by the availability of wood raw material. (We assume the same import development for sawlogs as in the reference scenario.) It is not profitable to invest in new sawmilling capacity compared with other investment alternatives. New sawmilling technology will be introduced at a slower rate in Austria than in other countries. As pointed out earlier, this negative development will partly be reinforced through the negative impact of the few or lacking investments will have on the productivity development and thus also on the development of the processing cost. Another negative influence, also already mentioned, is increasing unemployment in rural communities.

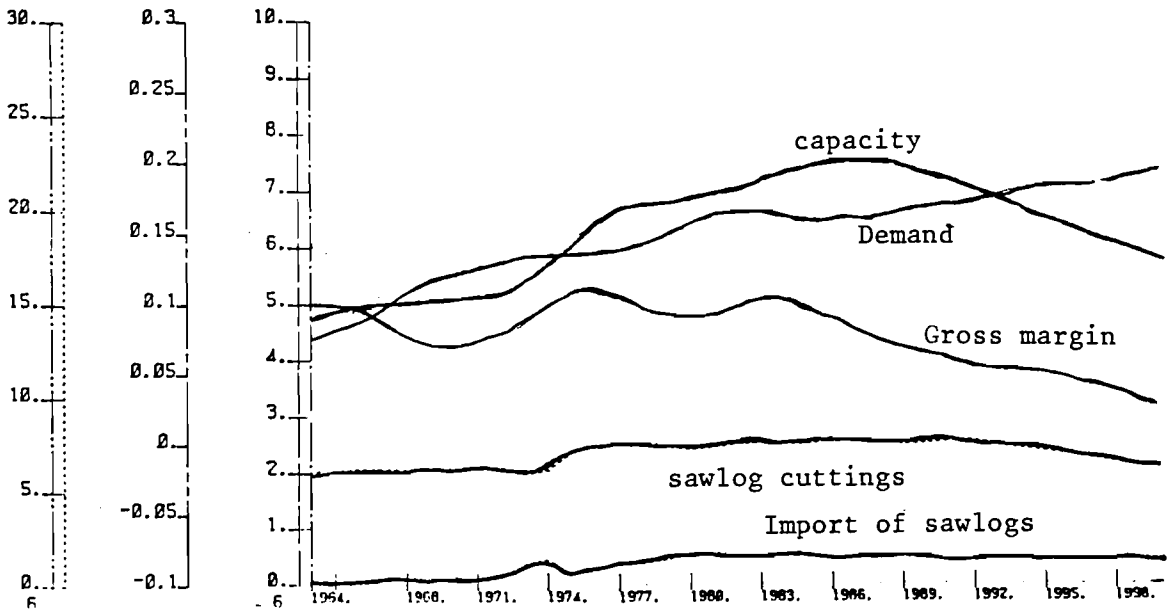

Figure 9. A scenario with "quick" factor cost development.

2.4 A Scenario with Improved Cash Flow

In this scenario, more money is available for investments in new sawmilling capacity and for forestry activities. This is achieved by decreased taxes. In the model, the result of an increase of the cash flow is increased investments and sawmilling capacity. Compared with the reference scenario the period of excess supply will be prolonged and therefore the situation is even worse As Figure 10 shows, a slight improvement in the gross profit level is possible to trace through a rapid installation of new equipment. The capacity cannot be increased without an increase at the market side and increased wood raw material supply at the same time. The effect of increased silvicultural activities, which in the model follows due to increased cash for forest management, is not seen because it will take generations before this materialize in increased increment and cuttings.

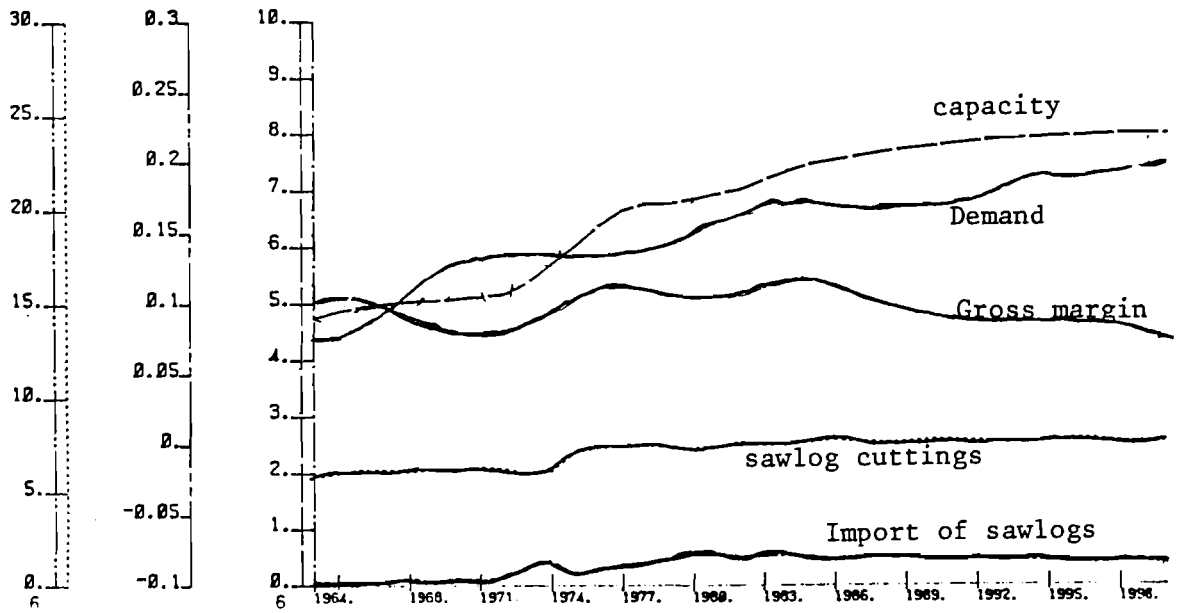

Figure 10. A scenario with improved cash flow.

3. CONCLUSIONS

More or less all the model runs identify the following problems for the Austrian sawmills:

1) excess supply

2) shortage of wood

3) uncertainty about the development of the profit level

What will actually happen, no one can predict. The model can just generate different scenarios -- scenarios that are the logical consequence of the model structure and made assumptions.

One reason for the "overshoot" of sawmilling capacity in the model during the 1980's is the assumption about a slower increase of sawnwood consumption than the historical one. The effect of this can be counterbalanced through a more *intense marketing* with the intention of increasing the market shares. This policy can be followed by the whole sector or by individual companies. Austria is well located for central, eastern and western European markets compared with, for example, Finland and Sweden. It is easier for the Austrian sawmills to keep in touch with its customers and adopt its products.

This marketing strategy is offensive and it assumes that the sawmills can be supplied with sawlogs. More wood could – from a physical point of view -- be made available through increased domestic *cuttings*,

which is possible if we look at the increment, and *import* of sawlogs. The cutting behavior of the forest owners can be affected by economic means for example through a combination of charges and rewards. The uncertainty about the future development of sawlog imports is more difficult to master. One possibility is long-term agreements or joint ventures. In a long-term perspective, it is possible to increase the production of the Austrian forest area. Different *silvicultural* activities could be subsidized or stimulated through favorable loans.

In the long run, however, it is necessary for the Austrian forest sector to be competitive. The scenarios have shown how sensitive the sawmills are on this point. The factor cost development is out of the hands of the sawmills. Arguments that could be used by managers for getting a governmental understanding for the necessity of achieving a cost development which fits into the price development of sawnwood are contributions of the sector to balance of payment, to employment opportunities and to the rural development. An offensive strategy for the sawmills to continue is to keep its *modernness* and always be on the edge of efficiency since this will also affect variable cost per cubic meter sawnwood. This has usually gone hand-in-hand with centralization because of economies of scale. The conflict with rural interests is obvious. Another drawback is decreased flexibility when it comes to capacity utilization. The government has of course several economic and financial measures to stimulate (or hamper) private initiative for modernization if this is found to be necessary. The last scenario, however, shows that one must be careful not to choose too general measures.

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APPENDIX

The following are members of the advisory group present at the first meeting at IIASA:

Kommerzialrat Dipl.-Ing. Wolfgang TEISCHINGER (sawmilling Industry)

Kommerzialrat Dr. Gottfried STEPSKI-DOLIWA (pulp and paper industry)

Baurat h.c. Dipl.-Ing. Dr. Eduard WALLNER (Wood-processing industry)

Dr. Leopold GOESS (Forestry)

Dr. Karl SEDELMAIER (Secretary of the Austrian Council of Forest Industries)

The Austrian project group consists of

Peter Glück

Hans Jöbstle

Peter Schwarzbauer

Hubert Sterba

They are all from the Agricultural University of Vienna (Universität für Bodenkultur).