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**HISTORICAL TRENDS IN FOREST PRODUCTS
MARKETS IN EUROPE**

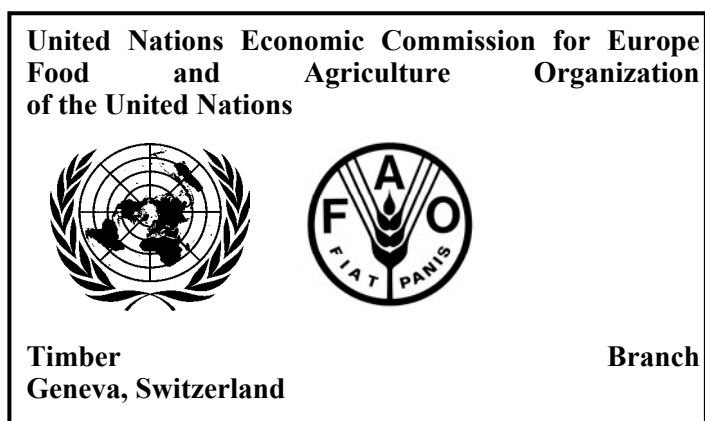
A study implemented in the framework of the European Forest Sector Outlook Study (EFSOS)

*by
Birger Solberg*



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Abstract

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SUMMARY

This study has the following main objectives: (i) to analyse the historical trends in forest products markets using international statistics (long-term timber databases) as well as other sources for Europe by countries and sub-regions; (ii) to identify major changes/"jumps" and describe the forces that have shaped these developments; (iii) to compare and contrast these trends between countries/sub-regions and over different time periods; and (iv) to review and compare these trends to the outlook study projections presented in ETTS (European Timber Trade Studies) IV and V. Most of the effort has been directed towards points i, ii, and iii.

The study is based on a qualitative analysis of historical data, most of which are shown in figures 1a-8d. No statistical testing of the hypotheses has been done. Nearly all of the statistical data used in the analysis are collected from FAOSTAT, IMF (International Monetary Fund), or the database of EFSOS. The analysis concentrates on international statistics for the following products: Industrial roundwood, sawnwood, wood-based panels, pulp, and paper and paperboard, following the forest products definitions of FAOSTAT.

One should be careful in drawing firm conclusions based on a rather limited study like this. Nevertheless, it seems that the following conclusions are justifiable:

1. The main historical trends in consumption and production of forest industry products in Europe are similar, and seem to follow major macroeconomic variables related to economic growth at the global and regional scale.
2. Major changes/"jumps" have occurred in the European forest products markets during the last four decades. The magnitude of these "jumps" varies considerably between countries and regions, according to how other related sectors of the economy have been simultaneously affected and to the ability of the respective economies to "absorb" sudden changes.
3. The main reasons for these "jumps" seem to be the institutional/political changes in eastern Europe and the former USSR in the late 1980s, oil market policy and price changes connected to OPEC, and changes in the general economic growth at the regional and global level.
4. Other factors like storm fellings in Europe, increased environmental regulations on forestry and forest industries, regulation of timber and forest product markets, policy changes in North America related to environmental protection, e.g. the spotted owl issue, and the US-Canada lumber dispute, etc, have also influenced the international markets for forest products, but their impacts seem to have been more modest than the impacts of points 1-3 and also more difficult to identify (because they may counterbalance each other).
5. Prices have been important in smoothing out the adjustment of the forest products markets, and have had stronger relative fluctuations than the changes in production/consumption volumes.
6. The outlook study projections presented in ETTS IV and V for western Europe have been rather accurate for the 10-years period regarding sawnwood and paper production and consumption, and within the confidence levels caused by the uncertainty in the forecasts of exogenous variables like future economic growth and elasticity estimates. The sawnwood projections do not, however, cover the strong cyclical movements within the 10-year periods very well. It has not been possible to go into deeper analyses of the accuracy of the ETTS projections. More detailed analysis needs to be done on that, focusing on the accuracy of the outlook study projections and the reasons where and why these projections were or were not correct, and giving recommendations for improvements of the methodologies to be used in future outlook study projections in Europe.

1 INTRODUCTION

1.1 Background

As part of the European Forest Sector Outlook Study (EFSOS), it was considered that an interesting task would be to collate and analyse information about historical trends in forest products markets in Europe, identify major changes/"jumps" and the main reasons for their occurrence, and compare ETTS IV and V projections with historical trends.

Such a study should give a better understanding of what has happened in the past in the forest sector and contribute to improved knowledge about the order and magnitudes of change one might expect in the coming decades. In addition, the study may give hypotheses of value for future, more comprehensive analyses.

The work was initiated in autumn 2001, but was delayed because of problems in getting statistics good enough for making comparisons over time, products, and sub-regions/countries.

1.2 Objectives and outline of the report

As specified in the terms of reference, the study should have the following main objectives:

1. To analyse the historical trends for forest products markets using international statistics (long-term timber databases) as well as other sources for Europe by countries and sub-regions.
2. To identify major changes/"jumps" and describe the forces that have shaped these developments (e.g. in terms of developments in technology, policies within and outside the forestry sector, institutional, political and legal arrangements, social changes, etc.).
3. To compare and contrast these trends between countries/sub-regions and over different time periods.
4. To review and compare these trends to the outlook study projections presented in ETTS IV and V.

It was agreed that the study should devote most of its efforts to points 1, 2 and 3, and that point 4 should be covered as well as possible given the data, time and other resources available for the study. It was also agreed that the work should be of a qualitative nature – i.e. that no statistical/econometric tests would be done.

The report is structured as follows: Chapter 2 describes methodology, data sources, and definitions used. Chapter 3 presents and discusses the main findings; and chapter 4 provides an overall discussion and the main conclusions of the study. The study is largely based on historical statistics shown in the figures at the end of the report.

2. METHODOLOGY

2.1 Some theoretical aspects

The production and consumption of wood and forest industry products in various countries are a result of complex interactions in time and space between many factors affecting demand and supply of these products. Solberg et al. (1996) gives a detailed overview of these factors and lists them as follows:

1. The current state of forest resources and forest industries' capacities
2. Population growth
3. Economic growth
4. Technological development and substitution between various types of products
5. Institutional and policy aspects, including trade
6. Relative prices.

It is important to realize that these factors interact with each other and influence both demand and supply of wood and forest industry products.

Factors 1 and 2 are self-explanatory. The third factor, economic growth, affects demand for forest products through growth in income, changes in the composition of the demand, and changes in the structure of economic activity. Economic growth also affects supply, mainly through changes in the demand for environmental and amenity services such as biodiversity, recreation and carbon sequestration. On the one side there are constraints on forest management, which will tend to decrease wood supply, but on the other side there are possibilities for increasing the demand of environmentally friendly forest products based on a renewable resource.

The fourth mentioned factor, technological change, has resulted in changes in the quantity and type of forest products that are produced and consumed, and changes in the quantity and type of raw material that is used to produce them. Through substitution, often of newly developed wood products for traditional wood products, but also of other materials for wood-based products, technological change has reduced the demand for wood. By developing new products that are complementary to wood or wood products (e.g various types of composites), technological change may increase the demand for wood. Similarly, through increasing processing efficiency, and the ability to economically utilize recovered fibre and previously unusable wood material, technology also has extended wood supplies.

The fifth factor - the institutional framework (including ownership rights, national and international policies, trade regulations, policies within and outside the forest sector, voluntary certification schemes, etc) - is important in determining the development of demand for forest products and the management of forests, as well as the supply and demand for forest industry products. This framework is an intricate web of interrelated information networks and organizations, and is made up of a complex of laws, customs, regulations, standards and the knowledge of how things are done.

Prices – or more correctly, relative prices – play an important role as they are the factors which make demand equal supply for given periods of time and thus make markets function. Prices of wood raw material, forest products, and products which are substitutes (or complementary to wood) are important factors in the short-term (say year to year) consumption and production decisions. Prices are equally important in the longer term as an indicator of expected return on investments (including R&D investments leading to technological change), and as indicators of the possible need to develop and implement policies. Consequently, through their effects on investments and policies, prices at a given point in time influence the future development of several of the demand/supply factors listed above. But likewise, the prices at one point in time are a function of the previous development of these factors. Therefore, the development of the relative prices gives information on the total impacts of all these demand/supply factors.

The importance of price as a mechanism in adjusting supply and demand often seems to be underestimated. Before analysing the various datasets, it may be appropriate to emphasize through an example how strong this mechanism can be in adjusting both the consumption and the production of wood products. Thus¹, assuming increased timber scarcity means assuming a decrease in timber supply, which in turn implies (other factors being equal) increased timber prices. Rising timber prices induce responses both in supply and demand. The supply responses may include:

- Logging in areas which were previously uneconomical to log
- Increased management intensity to grow more wood per area
- Reduction in timber rotations
- Increased plantation areas.

The demand responses of a price increase may include:

- Changes in trade flows
- Greater use of capital and labour (or recycled paper) in processing facilities to substitute these inputs for timber and economize on wood consumption
- Incorporate higher levels of technology per unit of product to substitute technology for wood
- Increased use of substitute materials for wood products
- Cultural changes to substitute new ways of living for old ones requiring more wood
- Less income to spend on goods in general, and thus also on forest industry products.

2.2 Hypotheses

Based on section 2.1 as well as a preliminary analysis and presentation at an EFSOS meeting in Geneva in January 2002, the following were put forward as initial working hypotheses:

- The historical trends in consumption and production of forest industry products in Europe are characterized by a long-term steady increase (ignoring cyclical movements)
- Major changes/“jumps” have occurred in the forest products markets during the last four decades
- The main reasons for these “jumps” could be many, as outlined in section 2.1

¹ The example is taken from Solberg et al. (1996:71-72), which builds on Binkley (1994).

- Prices have been important in smoothing out the adjustment of the forest products markets
- The outlook study projections presented in ETTS IV and V are burdened with considerable uncertainty.

2.3 Method, data, and definitions used

The study is based on a qualitative analysis of historical data, most of which are shown in figures 1a-8d. No statistical testing of hypotheses is done.

Nearly all of the statistical data used in the analysis are collected from FAOSTAT, IMF (International Monetary Fund), or the database of EFSOS. The analysis concentrates on international statistics for the following products: Industrial roundwood, sawnwood, wood-based panels, pulp, and paper and paperboard. The forest products definitions of FAOSTAT are as follows:

Other industrial roundwood

Industrial roundwood (wood in the rough) other than sawlogs, veneer logs or pulpwood. It includes roundwood that will be used for poles, piling, posts, fencing, pitprops tanning, distillation and match blocks, etc. It is reported in cubic metres solid volume underbark (i.e. excluding bark).

Sawnwood

Wood that has been produced from both domestic and imported roundwood, either by sawing lengthways or by a profile-chipping process and that, with a few exceptions, exceeds 5 mm in thickness. It includes planks, beams, joists, boards, rafters, scantlings, laths, boxboards and "lumber", etc., in the following forms: unplanned, planed, finger-jointed, etc. It excludes sleepers, wooden flooring, mouldings (sawnwood continuously shaped along any of its edges or faces, like tongued, grooved, rebated, V-jointed, beaded, moulded, rounded or the like) and sawnwood produced by resawing previously sawn pieces. It is reported in cubic metres solid volume.

Wood-based panels

This product category is an aggregate comprising veneer sheets, plywood, particle board, and fibreboard. It is reported in cubic metres solid volume.

Wood pulp

Fibrous material prepared from pulpwood, wood chips, particles or residues by mechanical and/or chemical process for further manufacture into paper, paperboard, fibreboard or other cellulose products. It is an aggregate comprising mechanical wood pulp; semi-chemical wood pulp; chemical wood pulp; and dissolving wood pulp. It is reported in metric tonnes air-dry weight (i.e. with a 10% moisture content).

Paper and paperboard

The paper and paperboard category is an aggregate category. It represents the sum of graphic papers, sanitary and household papers, packaging materials and other paper and paperboard. Products in this category are generally manufactured in strips or rolls of a width exceeding 15 cm (36 cm for HS 48.13 and 48.19) or in rectangular sheets with one side exceeding 36 cm and the other exceeding 15 cm in the unfolded state. It excludes manufactured paper products such as boxes, cartons, books and magazines, etc. It is reported in metric tonnes.

In the historical statistics used, the term "consumption" means "apparent consumption" - i.e. production minus export plus import. Changes in stock are not included.

Regarding regions, the following definitions are used:

EU/EFTA – subregion of Europe:

Austria	Iceland	Portugal
Belgium	Ireland	Spain
Denmark	Italy	Sweden
Finland	Liechtenstein	Switzerland
France	Luxembourg	United Kingdom
Germany	Netherlands	
Greece	Norway	

Central East European Countries (CEEC) – subregion of Europe:

Albania	Hungary	Slovenia
Bosnia-Herzegovina	Poland	The former Yugoslav Republic of Macedonia
Bulgaria	Romania	
Croatia	Serbia and Montenegro	
Czech Republic	Slovak Republic	

Commonwealth of Independent States (CIS) :

Armenia	Kazakhstan	Tajikistan
Azerbaijan	Kyrgyzstan	Turkmenistan
Belarus	Republic of Moldova	Ukraine
Georgia	Russian Federation	Uzbekistan

the former USSR

CIS		
Lithuania	Estonia	Latvia

North America:

Canada	United States of America
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To prevent “drowning” in detail, it has been necessary to concentrate the study to a few regions, and mainly the following have been used: the former USSR, CEEC, and EU/EFTA. They are assumed to give a consistent coverage of the main regional changes in the European forest products markets during the last 4 decades.

3 RESULTS AND DISCUSSIONS

3.1 Identification of historical trends and “jumps” in forest products markets

Industrial roundwood

Regarding industrial roundwood harvest, it is seen from figure 1a that at the regional level there have been some different trends in the three markets EU/EFTA, the former USSR, and CEEC. The CEEC had a rather flat growth trend until around 1984, then a steep decline (until 1992), followed by a steep increase. Except for smaller reductions in 1966, 1968 and 1972, EU/EFTA has had a rather stable increase in industrial roundwood harvest from 1964 -1990 (the special reason for the steep increase from 1988 to 1990 is discussed in section 3.2), and from 1991/92 - 2000. The former USSR has had a similar pattern as EU/EFTA, but with a much greater decline after 1990, and with a longer period (by two years) before the trend started to reverse. The increase since 1992 in the industrial roundwood harvest has been more or less similar in the two latter regions. Figure 1b shows that the harvest volume for the former USSR is to a large extent explained by the harvest development in the Russian Federation, but also to some degree by the harvest trend in the Baltic countries.

Figure 1d gives a more detailed overview for some selected western European countries, with emphasis on the four leading countries; Sweden, Finland, Germany and France (mentioned in order of harvest quantities). It is seen that the major “high” and “low” harvest years are almost identical for these countries (with an exception of Finland’s strong increase during the period of 1975-1980, and the increase for France and Germany in the year 2000).

From figure 1a it is seen that “jumps” occur in 1971-72, 1974-75, 1988-90, 1990-93, 1995-96, and 1999-2000. However, the harvest change from 1990 to the nearest “low point” year (1994 for the former USSR and 1992 for the other two regions) is by far the most important one. The harvest decline was 206 mill m³ for the former USSR, 71 mill m³ for EU/EFTA, and about 24 mill m³ for CEEC, a respective decline of 68%, 25%, and 41 % of the harvest volumes in 1990.

Sawnwood

Figure 2a shows a similar trend for sawnwood consumption (in the three regions EU/EFTA, CEEC and the former USSR) as figure 1a did for industrial roundwood harvest.

Figure 2c shows that the sawnwood production and consumption in the CEEC follow the same pattern over time, but that production after 1992 increases more than consumption indicating increasing net exports of sawnwood from this region. The same pattern emerges from figure 2b for the former USSR.

Figure 2d also emulates the trends for production and consumption in EU/EFTA. It is also seen that the difference between production and consumption for this region is closed by 1993, whereas after 1996, consumption is again higher than production indicating net imports. This is of the same order of magnitude as the export surplus from the former USSR and CEEC for this period, indicating exports from these regions to EU/EFTA.

From figure 2a we see nearly the same “jumps” for sawnwood consumption as for industrial harvest volumes (shown in figure 1a), but with one particular difference for EU/EFTA, where the decline in sawnwood consumption during 1990-1993 is nearly of the same order as the decline during 1973-1975. Also, figure 2a shows that the consumption change from 1990 to the nearest “low point” year (1997 for the former USSR, 1993 for EU/EFTA and 1992 for the CEEC) is the most important one, where the sawnwood consumption decline was 72 mill m³ for the former USSR, 12.2 mill m³ for EU/EFTA, and 7.7 mill m³ for the CEEC – corresponding to declines of respectively 84%, 17%, and 67 % of the consumption volumes in 1990 for these regions. This relative decline is higher than the industrial harvest decline discussed above for the former USSR and CEEC, but less for EU/EFTA.

Wood-based panels

Figure 3a shows that the increase of panels production (in EU/EFTA, CEEC and the former USSR) has been stronger and more stable during 1961-2001 than for sawnwood production (see figure 2a). The two products have, however, had nearly the same trends; high production years (1973, 1980, 1990, and 2000) and low production years (1975, 1982, 1992, 2001).

Figure 3b shows that after 1993, the production of panels has been higher in the former USSR than the consumption, indicating net exports from the region. Figures 3c and 3d show that production and consumption of panels, in both EU/EFTA and CEEC, have developed similarly over time, giving no indications of major changes in export/import relations since 1961.

Pulp for paper production

Figures 4a shows a steady increase of pulp production in the former USSR from 1961 - 1978, a small decline in 1979, an increase from 1980 - 1989, then a strong decrease until 1994, an increase in 1995 followed by a corresponding decrease for 1996 and thereafter a rather strong increase. Consumption followed the same pattern, but production has since 1992/93 been increasing more than consumption, indicating increasing net exports.

A similar pattern emerges from figure 4b for the CEEC, with the exception that the difference between consumption and production increased during the period 1961-1989, indicating increasing net imports.

Figure 4c shows that EU/EFTA has had more important “ups” and “downs” regarding both production and consumption than the two other regions, indicating that market forces have had a stronger influence in EU/EFTA. The figure also shows that the difference between pulp production and consumption has been increasing. The deficit has been covered by increased imports and increased use of recycled (recovered) paper for paper production.

Figure 4d shows the increase in use of recovered paper for pulp production in EU/EFTA compared to virgin pulp production. Figure 4e shows the development of collection and utilization rates of recovered paper for this region. It is seen from figure 4d that the use of recovered paper has increased more rapidly since 1990 than in the previous three decades, and that the rate of increase for use of recovered paper has only fallen twice since 1961: in 1974-75 and in 1989-90.

Paper and paperboard

Figure 5a shows the production of paper and paperboard. The same patterns emerge as for pulp (see figures 4a-4c). It is also interesting to see from figures 5b and 5c, the huge drops in production and consumption of paper products that occurred in the CEEC and former USSR after 1989. This large drop (in the CEEC and former USSR) is not at all visible from the production and consumption of paper and paperboard in the EU/EFTA region during the same period (1989 and some subsequent years) and contrasts with the clear decline seen for the years 1974-75. This is the clear “jump” for EU/EFTA seen in figure 5a, together with a production decline for 1990-1993 in the former USSR and CEEC. It is also interesting to note the production decrease in EU/EFTA during 1979-1982 shown in figure 5a. Figures 5b-5d compare production and consumption of paper and paperboard. The same patterns emerge as described above for pulp shown in figures 4a-4c.

Prices

As discussed in chapter 2.1, prices are vital in making markets function. Figures 6a-6e describe the price development for some selected products and countries, and show several interesting aspects. For nearly all products and countries² included in figures 6a-6d, nominal prices in US\$ per unit of forest product were rather stable from 1964-1973, then increased until 1974 when they declined, then increased until 1979 followed by a relatively steep decline in 1982, then increased until 1989 followed by a strong decrease until about 1993, followed by an increase until about 1996 and then a decrease. Clear low-price years have been 1975, 1983, 1993 and 1994. Clear high-price years have been 1973, 1974, 1981, 1982, 1988-1990 and 1995. These years follow closely (with some lags reflecting individual countries' economic policies and their industries' ability to adjust production) the consumption and production patterns observed in figures 1-5 and the economic growth shown in figure 7c for EU/EFTA.

² The patterns differ some between the products. Also, some strange price changes are seen for some countries and products - in figure 6a for Austria in 1997-99, in figure 6b for Sweden during 1999-2001, in figure 6c for Sweden in 1976, and in figure 6d for Germany during 1966-73, France in 1976 and Norway during 1999-2001. The reasons for these changes are not clear, but could be one or several of the following factors: devaluations of national currencies, stock changes, assortment changes, or errors in the statistics.

Figure 6e taken from Veidahl (2002) presents a long-term price development for the period 1905-2001 for roundwood prices and related costs in Norway, and as such is of interest as it makes it possible to put the changes discussed above for the period 1961-2001 into a longer perspective. The figure presents the average price delivered roadside (upper line), the harvest costs (covering felling and terrain transport to roadside), and the net stumpage price (lower line) as the difference between the two other price series – all deflated in real term prices using the consumer price index for Norway. Such a long and consistent price series is rare, but another has been independently produced for Denmark, giving a very similar price pattern for the same roundwood prices and related costs (Thorsen 1996). Among other things, figure 6e shows a strong decline in stumpage prices from 1964, interrupted by some increases – notably in 1963-64, 1972-74, 1983-85 and 1994. These years correspond very closely to the years having high economic growth in EU/EFTA shown in figure 7c. Figure 6e also shows that since 1977, the net stumpage price in Norway has been lower than the average for the whole period 1905-2001, and that the price since then has been decreasing over time (with the exception of the high price years mentioned above).

3.2 *Reasons for major changes*

The development of forest products markets is complicated, involving many factors. One should therefore be cautious when attempting to explain what have been the main reasons for changes in these markets, in particular in a small study like this. However, it may be easier to explain major “jumps” than the more long-term changes, and in line with the discussion in chapter 2.1 and 2.2, I will concentrate on the following factors as important explanations.

Economic growth and income

Economic growth and income (income understood as gross domestic product per capita multiplied by population) is surely behind the growth trend in consumption, observed in section 3.1, for all the forest products covered there. It can be seen that this growth trend is lowest for sawnwood and highest for paper and paperboard, reflecting different income elasticities for these products. Economic growth also explains a considerable part of the short term fluctuations and main “jumps” in production and consumption. This is indicated by figures 7a-7e. Comparing them with figures 1a, 2a, 3a, 4a, and 5a, it is seen that the major “jumps” in production or consumption of forest products are strongly correlated with economic growth. For example, the steep increase in harvest volume in EU/EFTA during 1987-90 (shown in figure 1a) is probably caused by a combination of the high economic growth (as shown in figure 7c and 7d) and high real term interest rates (as shown in figures 7g). Likewise, figure 7c shows that in EU/EFTA the economic growth (in real term) declined from about 5.8 % per annum in 1973 to about minus 0.8 % per annum in 1975. During the same period production and consumption in Europe declined considerably for all forest products in all regions. Behind the recession in 1974-75 was the first oil crisis, an institutional factor which will be discussed in a separate section below. But needless to say, there is often a connection between institutional/policy factors and economic growth. Similarly, figure 7c shows that from 1988 - 1993, EU/EFTA experienced another strong recession, as the economic growth decreased from 3.9 % per annum (in real terms in 1988) to minus 0.4 % per annum in 1993. As shown by figure 1a, this created a larger decrease in harvest volume than the recession in 1973-74, whereas for sawnwood consumption, the impacts were about equal for the two recessions. An interesting point shown by figure 2d, is that even though the consumption impacts were more or less on the same magnitude in these two recessions, the impact on production of sawnwood was much less in 1990-92 than during the 1973-75 period. This could to some degree be explained by easier trade conditions (lower trade costs, less regulations, etc.) around 1990 than in 1975. The main reasons for the recession of 1989-93 was the political, social and economic changes happening in the CEEC and former USSR. These changes had even stronger impacts in these regions than in EU/EFTA, as clearly shown in figures 1a, 2a, 3a, 4a and 5a.

Above, we have discussed the impacts for Europe when viewed as three regions. The impacts at country level vary, but there is (as shown by figures 7a, 7b, 7c, 7d within lags of 1-3 years), a strong similarity between the countries' growth patterns. Such lags may reflect different economic policies (foreign exchange rates, monetary policies implying different interest rates), different employment or trade policies, or other institutional/policy factors reflecting country specific situations. Figures 7d-7i shows these differences for some selected countries regarding foreign exchange rates and interest rates.

Obviously, prices have a strong influence on production and consumption volumes. For EU/EFTA, figures 1a, 2c, 3d, 4c, 5d and 6a-6d show that the prices in well functioning forest product markets fluctuate relatively more than production (or consumption), and that the ratio between price fluctuation and production (or consumption) fluctuation is higher for high capital intensive products like pulp and paper than for lower capital intensive products like sawnwood.

Institutional factors

Institutional factors influence the long-term trend, but as already mentioned, their impacts on such trends are difficult to identify in a study like this, partly because they enter at different times and with different intensities in the various countries, and partly because they may counterbalance each other. Identification of reasons for sudden changes/"jumps", however, should be easier, and here two factors seem to be strong and rather easy to identify from the data of this study: the so-called "oil crisis" (the first in 1973-1974 followed by the second and milder "crisis" of 1979-1980); and the structural changes in the former USSR and eastern Europe after 1989. The "oil crisis" was a result of OPEC policy. Why this cartel succeeded (and the rest of the world accepted such a cartel) is an interesting political science study in itself, but beyond the scope of this report. The cartel's impacts on the forest products markets were mainly through its impacts on economic growth, but most likely it also had impacts through structural changes. Higher oil and energy prices affected the cost structure and relative comparative advantages of countries. Trade balance changes implied changes in foreign exchange rates and interest rates, reflecting the likelihood of the various countries attempting to counterbalance import deficits caused by increased oil prices and increased prices of imported energy intensive products. Also, special bilateral changes occurred, for example, it may be argued that the strong increase in Finland's harvest volume from 1975 - 1980 could partly be connected to a trade agreement between Finland and the USSR (USSR payed with oil, minerals, and goods in return for imports from Finland).

The structural changes in the former USSR and eastern Europe resulted in output losses (measured as GDP decreases) which were unprecedented in recent history. The decreases are shown in figures 7a, 7b, and 7e. From figure 7e it is seen that Russia's GDP fell by about 45% during 1989-98, whereas the corresponding estimate for the whole of the former USSR during this period was about 50%. It can also be seen from figure 7e that many of the economies of the the former USSR (like the Ukraine) have had a very slow recovery since. This loss can be put into perspective by comparing it with the fact that during the Second World War, the national income of the USSR fell by 20% over 1940-42, but recovered its 1940 level by 1944 (Popov 2001, Cornia and Popov 2001). During the Great Depression (1929-33) GDP in the western countries fell by 30%, but by the end of the 1930s it had recovered its pre-recession levels (Popov, op.cit.).

Several studies have been made to analyse the main reasons for the deep decline of the former USSR. One of the most recent studies, Cornia and Popov (2001), gives three main reasons: first, greater distortions in the USSR's industrial structure and external trade patterns on the eve of the transition; second, the collapse of state and non-state institutions which occurred in the late 1980s and early 1990s, resulting in crisis management instead of organized and manageable transition; and third, poor economic policies related to macroeconomic stability and import substitution.

Figure 7b and 7e show that countries in the CEEC had a lower economic decline and a more rapid recovery than the economies in the former USSR. This is probably caused by a smoother transition of institutions and policies than in the former USSR.

Trade is another important institutional factor. Several studies – e.g. Bingen (2002), Peck (2001) and Solberg et al. (1996) - analyse changes in trade of roundwood and forest industry products since the 1960s. Two main results emerge with particular interest for this study: (i) steadily increasing international trade in nearly all forest products during this period, with the volume of trade increasing more than that of production and consumption; (ii.) this trade increase has been interrupted by temporary "jumps", which to a large degree follow the production/consumption "jumps" discussed above. For more recent years, UNECE (2001: 51) shows that the export of industrial roundwood from the CIS to EU/EFTA countries increased by 95% from 1996 to 1999.

Other factors

Storm fellings surely had impacts on the supply of roundwood, depressing timber prices and leading to changes in harvest patterns and trade. It has not been possible to collate reliable volumetric information on

storm fellings over the last decades for the three main European regions considered in this study. However, it is generally known that parts of Europe experienced heavy storm fellings in 1969, 1987, 1991, 1992 and 1999. UNECE (2001:45) reports that the storm fellings in Europe in December 1999 totalled 193 mill m³, and that particularly France, Switzerland, Denmark, and Germany were severely hit, volumes being respectively 325%, 288%, 159% and 77 % of the annual removals in 1998 for these countries. The increases of harvest volumes (removals) in France and Germany in the year 2000 seen in figure 1d, are probably a consequence of this, and could also be one factor among others explaining the harvest increase this year for the EU/EFTA region shown in figure 1a. The impacts of such large incidents are for sure strongest in the countries in which they occur, and will be less visible for larger areas because of the various adjustment mechanisms described in section 2.1.

Other factors like stiffer environmental regulations on forestry or forest industries, regulation of timber and forest product markets, forest certification issues, policy changes in North America related to environmental protection related to the spotted owl issue, US-Canada lumber disputes, and the general economic development in Asia and North America, etc., have also most likely influenced the markets for forest products. Their impacts, however, seem to have been more modest, gradual or incorporated in the economic growth for Europe than the impacts discussed above. As mentioned before, these factors are more difficult to identify because they may counterbalance each other.

3.3 Comparisons of historical trends with ETTS IV and ETTS V projections

Figures 8a- 8c compare historical production and consumption figures with ETTS IV and ETTS V projections, as given in UNECE (1986 a,b), and UNECE (1996). In addition, the “most likely” projection from FAO (1999) is included and also some preliminary analysis from the ongoing ETTS VI study. The comparisons are only done for western Europe (corresponding to the term “OECD Europe” used in ETTS V), as the projections for the other European regions are bound to be wrong because of the dramatic changes in the former USSR and CEEC since the end of the 1980s. Because of limited resources, the comparison is concentrated on the production and consumption of the two products, sawnwood and paper.

The methodology behind the ETTS IV and ETTS V projections are described in detail in UNECE (1986, 1996). Both are based on econometric studies of income and price elasticities for consumption of the various forest products. It has not been possible in this study to go into a detailed analysis of the projections. However, the assumptions regarding economic growth is essential in both the ETTS IV and ETTS V projections, and their assumptions are as shown in table 3.1.

Table 3.1
Assumptions on GDP forecasts in ETTS IV and V for western Europe
(% p.a., real term).

Study	Period											
	1980-85		1985-90		1990-95		1995-2000		2001-2005		2006-2020	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
ETTS IV	2.4	3.2	2.4	3.2	2.4	3.2	2.4	3.2				
ETTS V					1.2	1.2	2.0	2.9	2.0	2.9	1.6	1.8
Historical average based on fig.7c		1.7		3.2		1.8		2.5				

Source: UNECE(1986a:16) and UNECE (1996:12)

Figure 8a shows results for the comparison of sawnwood consumption in western Europe. Regarding the ETTS IV projections, several interesting aspects emerge. It is seen that the decline in historical consumption from 1980 to 1985 and the increase from 1985 to 1990 counterbalance each other so that projections and the historical data in 1990 are nearly equal. By 2000 the high (BH – basic high) projection is much higher than the actual historical figure, and even the low (BL - basic low) projections is higher than the actual historical figure. A significant reason for this is probably the assumed economic growth rates shown in table 3.1, which can be compared to the rates in figure 7c of about (per annum basis) 1.7 % on average during 1980-85, about 3.2 % on average for the period 1985-1990, about 1.8% for 1990-1995, and about 2.5 % for 1995-2000. The

same picture emerges from figure 8b for ETTS V production forecast (ETTS IV did not have projections of sawnwood production).

In summary, one may conclude that the sawnwood projections for 10 years intervals have been fairly accurate and definitely within the expected uncertainty range caused by assumptions of exogenous variables, in particular economic growth. However, the cyclical nature of the sawnwood sector within 10-year cycles is poorly covered in these projections.

Regarding paper consumption for the periods 1980-1990 and 1990-2000, figure 8c shows that ETTS IV gives a lower estimate than actual historical data for the low growth assumption, but the high growth assumption gives a more accurate projection during the same periods. This, together with the historical growth figures in figure 7c, indicates that the income elasticities used in the projections were too low. Figure 8d shows the same characteristics for the ETTS V projections of paper production as figure 8c shows for consumption, but in the former figure for production, the ETTS V projections underestimate more than in the latter for consumption, indicating that the investment in new capacity has in reality been higher than projected. All figures 8a, b, c, and d show that the FAO projections and the preliminary ETTS VI projections are in line with each other, and that their main differences arise from the projections' starting point. This makes for large differences, particularly for the more cyclical sawnwood sector. Further, more detailed analysis should be done regarding the accuracy of the outlook study projections and the reasons where and why these projections were or were not correct, and give recommendations for improvements to the methodologies to be used in future ETTS outlook study projections. A rather interesting aspect in this connection, will be to find the proper balance between uncertainty in econometric estimates based on historical data (for example, end-use categories) versus the uncertainty involved in forecasting exogenously their future development. It may be that for certain types of analyses, simple models based on GDP growth are less uncertain in total than the more sophisticated models that need forecasts of exogenous variables, which are very difficult to predict.

4 OVERALL DISCUSSION AND CONCLUSIONS

There are several uncertainties related to this study. First, the official statistics may contain errors or misleading figures: because stock changes have not been included, apparent consumption is used instead of actual consumption; products may have changed within the definitions used; and some statistical records may simply be wrong. Secondly, the study is basically a qualitative analysis, providing no statistical testing of hypotheses. Third, factors important for the functioning of the European forest product markets may have been omitted, for example previous storm fellings, and/or relevant incidences in other areas like North America or Asia. One should therefore be careful in drawing firm conclusions based on a limited study like this. Nevertheless, it seems that the following conclusions are justifiable:

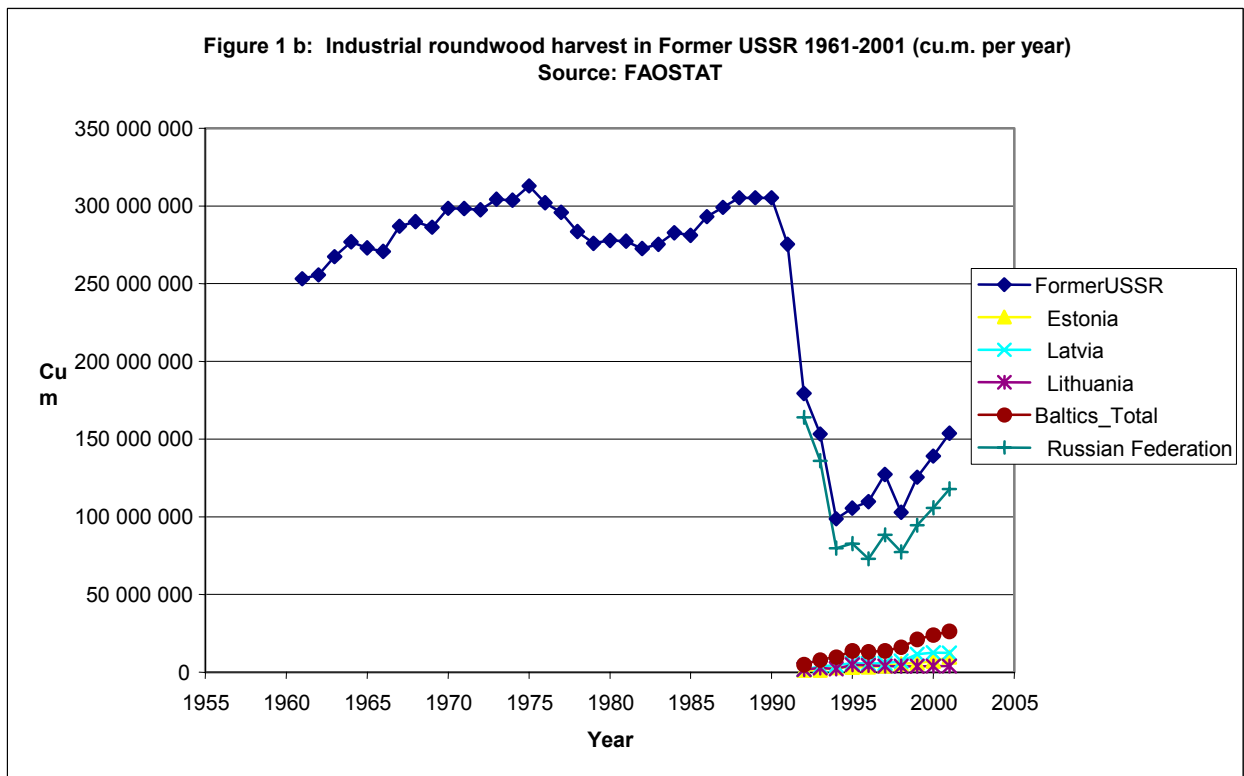
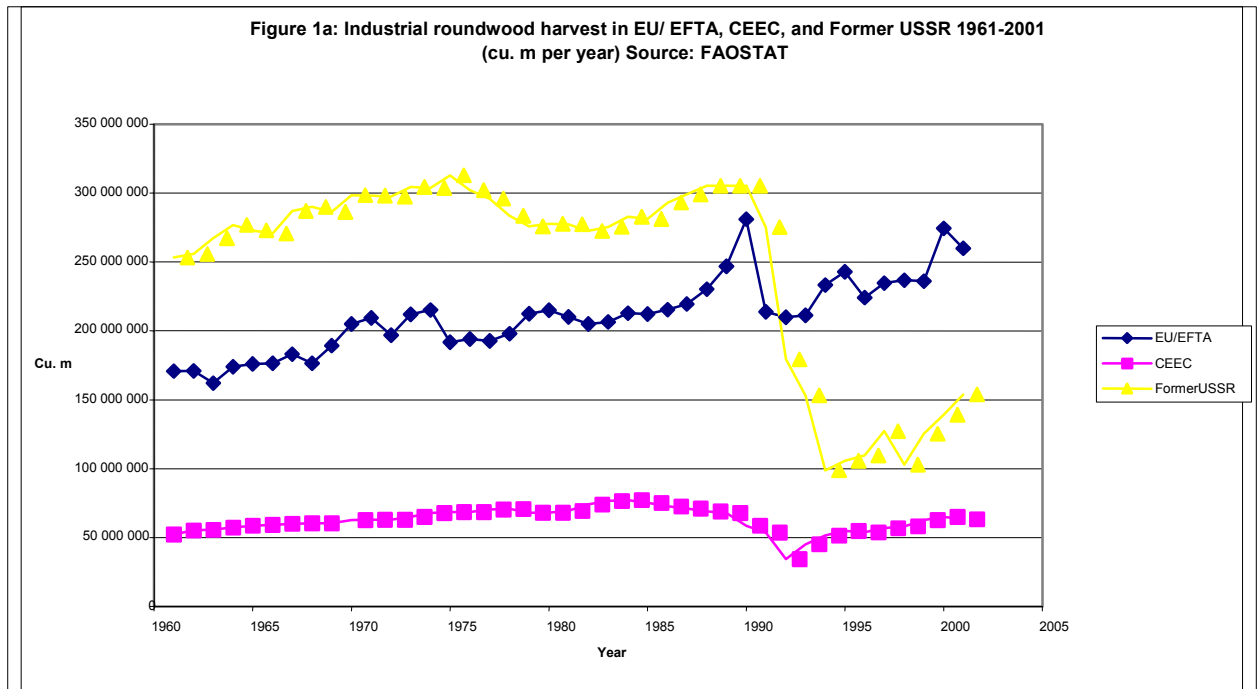
1. The main historical trends in consumption and production of forest industry products in Europe are similar, and seem to follow major macroeconomic variables related to economic growth at the global and regional scale.
2. Major changes/"jumps" have occurred in the European forest products markets during the last four decades. The magnitudes of these "jumps" vary considerably between countries and regions, according to how other sectors of the economies involved were simultaneously affected and the ability of the respective economies to "absorb" sudden changes.
3. The main reasons for these "jumps" seem to be the institutional/political changes in eastern Europe and the former USSR in the late 1980s, oil market policy changes connected to OPEC, and changes in the general economic growth at regional and global levels.
4. Other factors like storm fellings in Europe, increased environmental regulations on forestry and forest industries, regulation of timber and forest product markets, policy changes in North America related to environmental protection (spotted owl) and the US-Canada lumber dispute, etc., have also influenced the markets for forest products, but their impacts seem to have been more modest than the impacts of 1-3 and also more difficult to assess (because they may counterbalance each other).
5. Prices have been important in smoothing out the adjustment of the forest products markets, and have had stronger relative fluctuations than the changes in production/consumption volumes.
6. The outlook study projections presented in ETTS IV and V for western Europe have been rather accurate for the 10-year periods regarding sawnwood and paper production and consumption, and within the

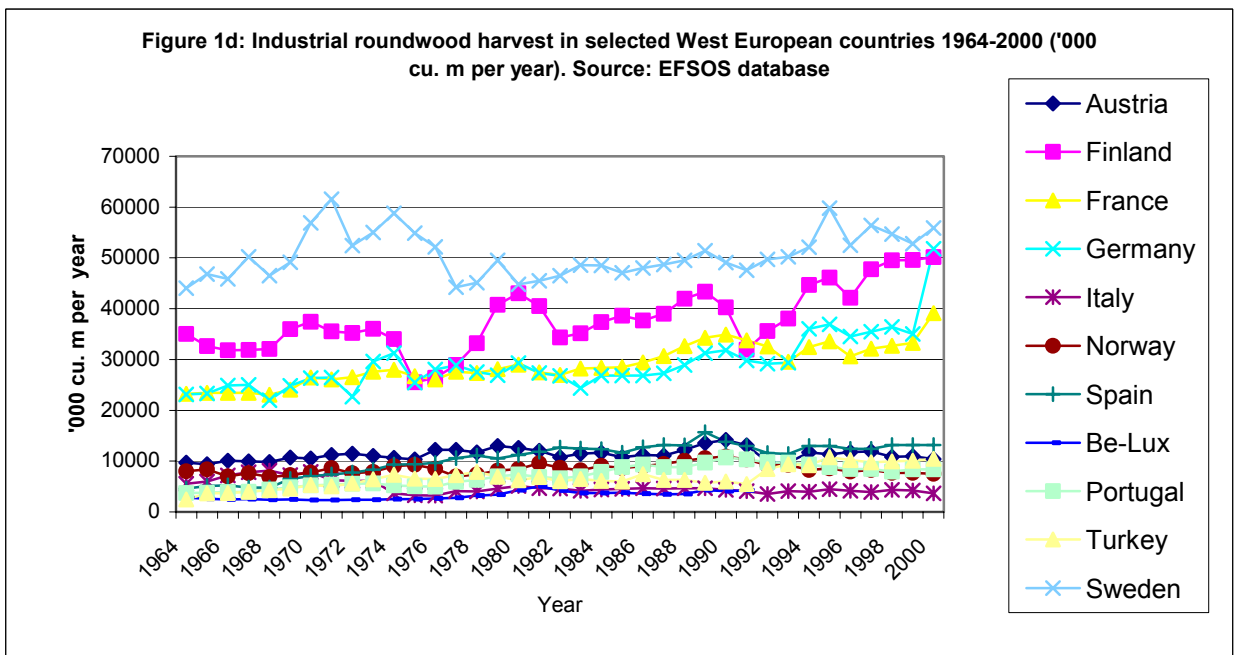
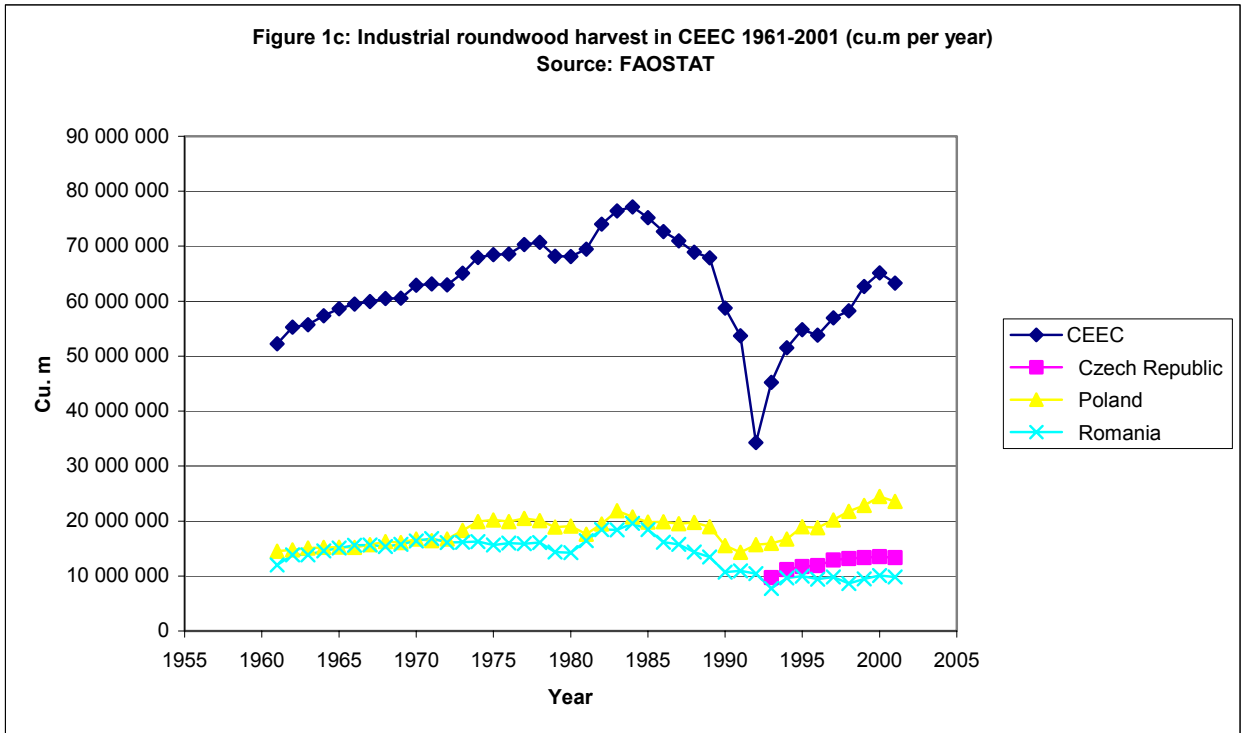
confidence levels caused by the uncertainty in the forecasts of exogenous variables like future economic growth and elasticity estimates. The sawnwood projections do not, however, cover very well the strong cyclical movements within the 10-year periods. It has not been possible to go into deeper analyses of the accuracy of the ETTS projections. Further more detailed analysis should be done on that, focusing on the accuracy of the outlook study projections and the reasons where and why these projections were or were not correct, and giving recommendations for improvements of the methodologies to be used in future outlook study projections in Europe.

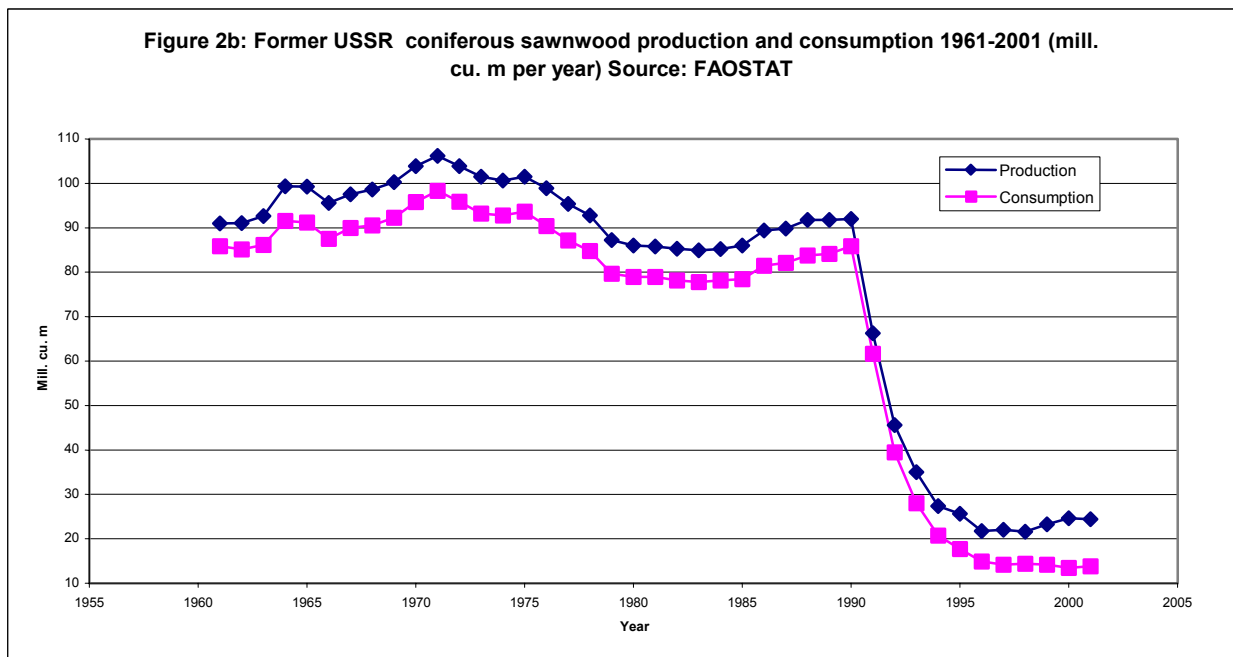
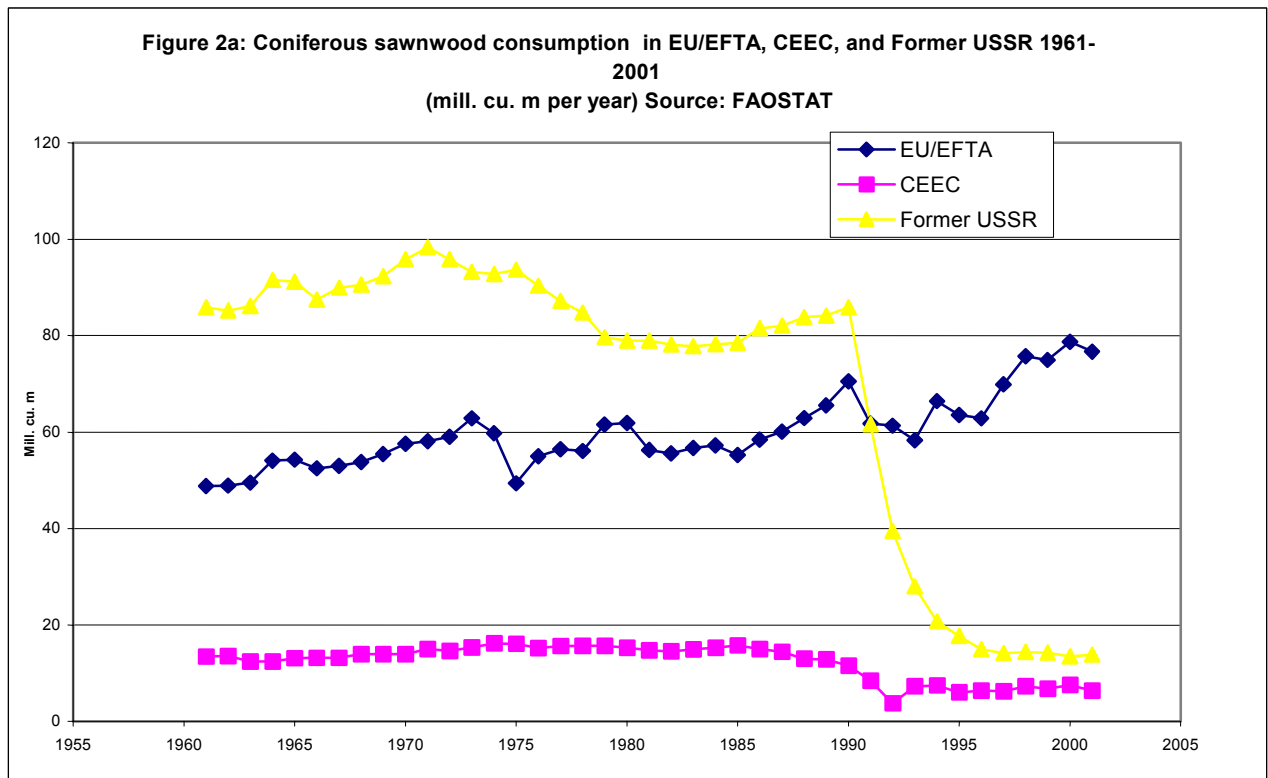
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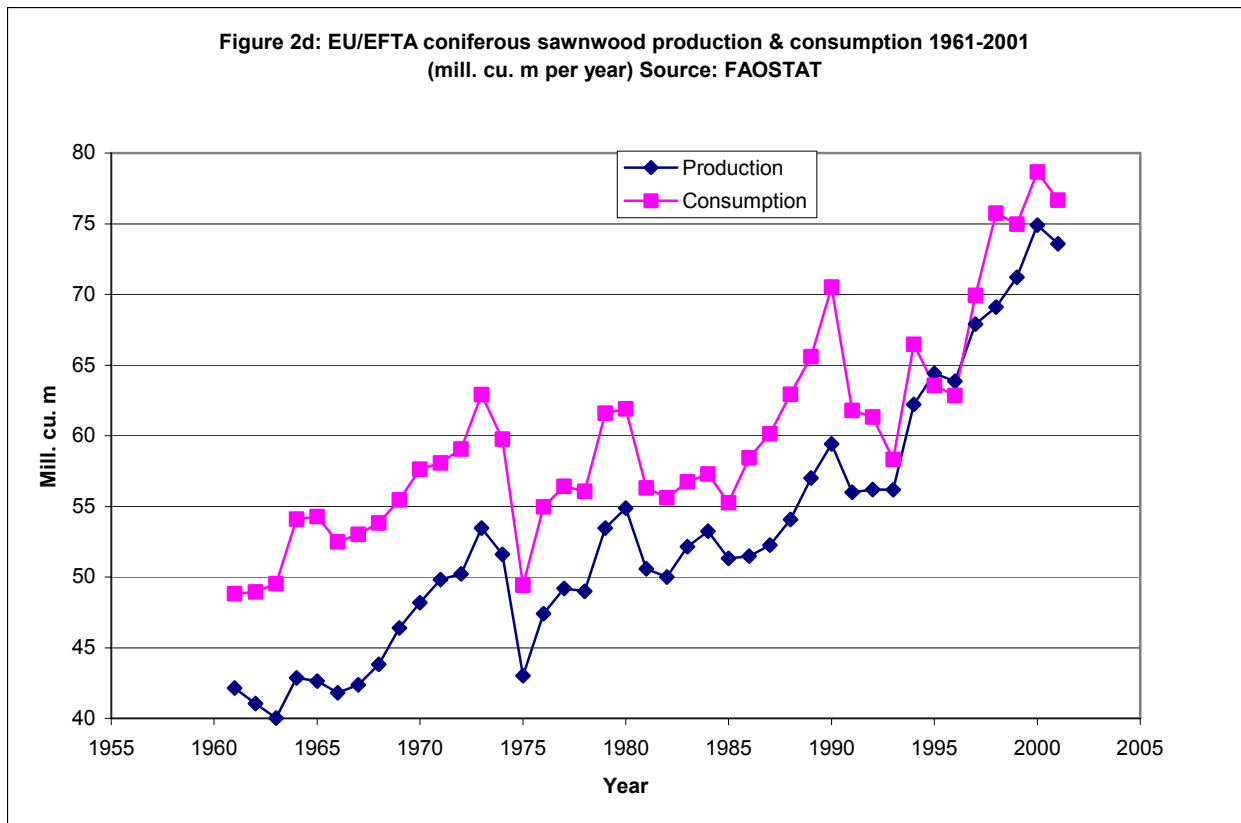
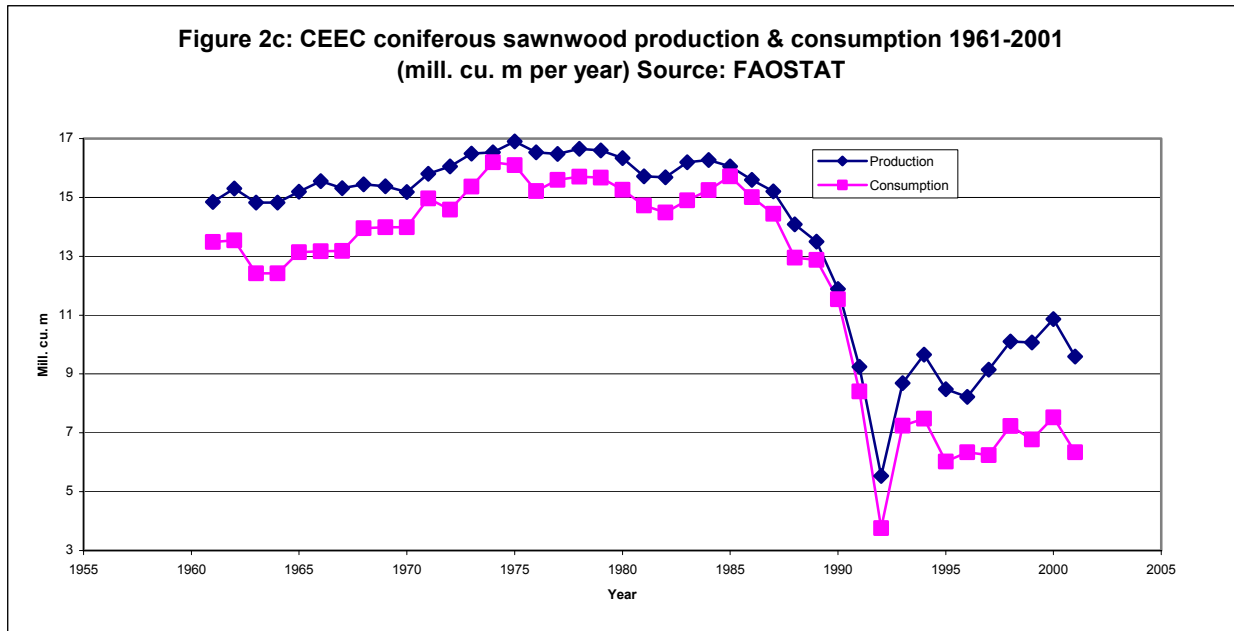
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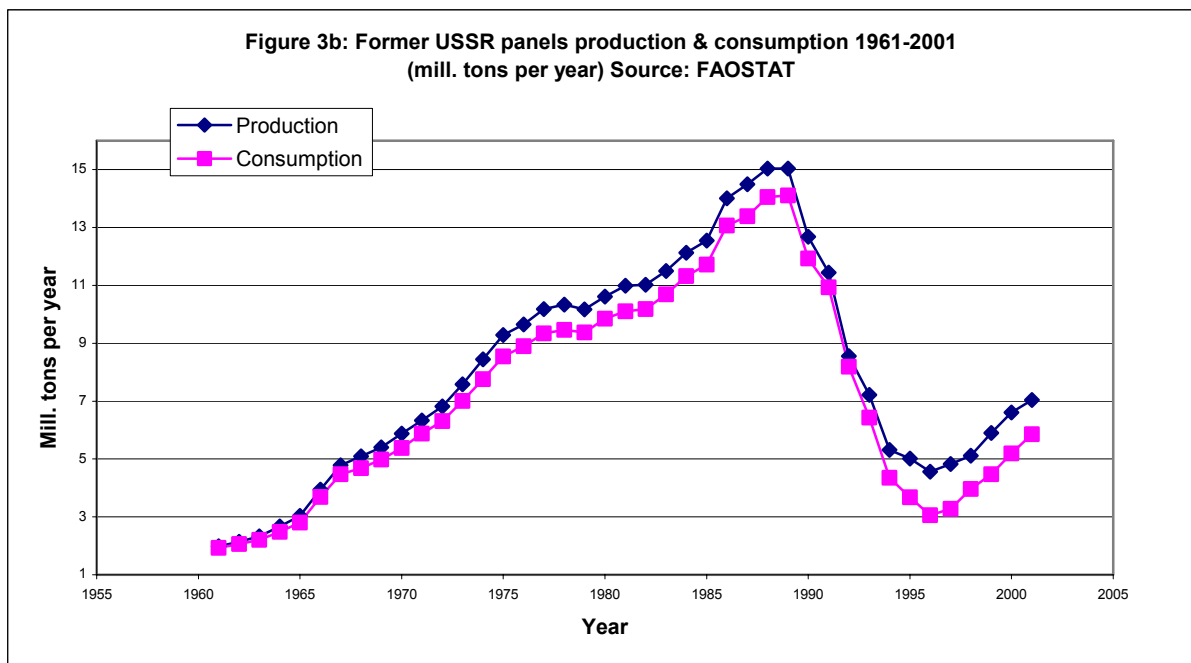
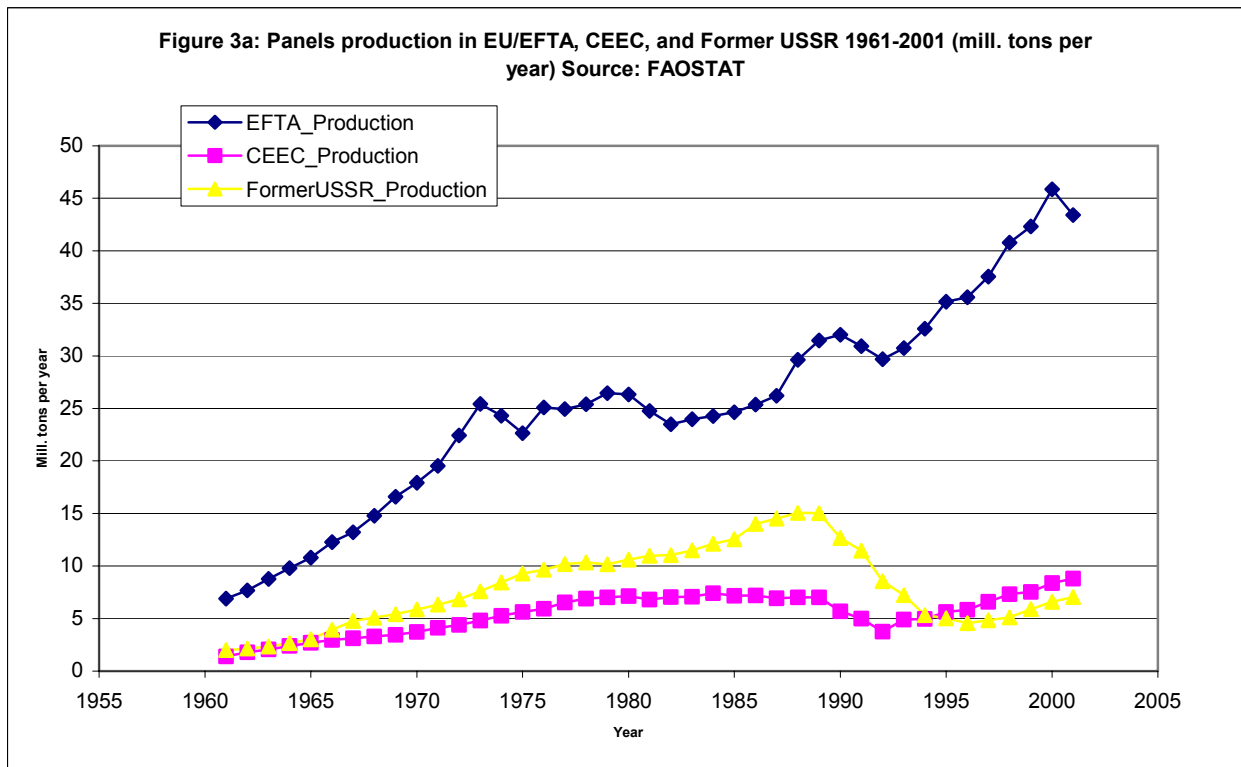
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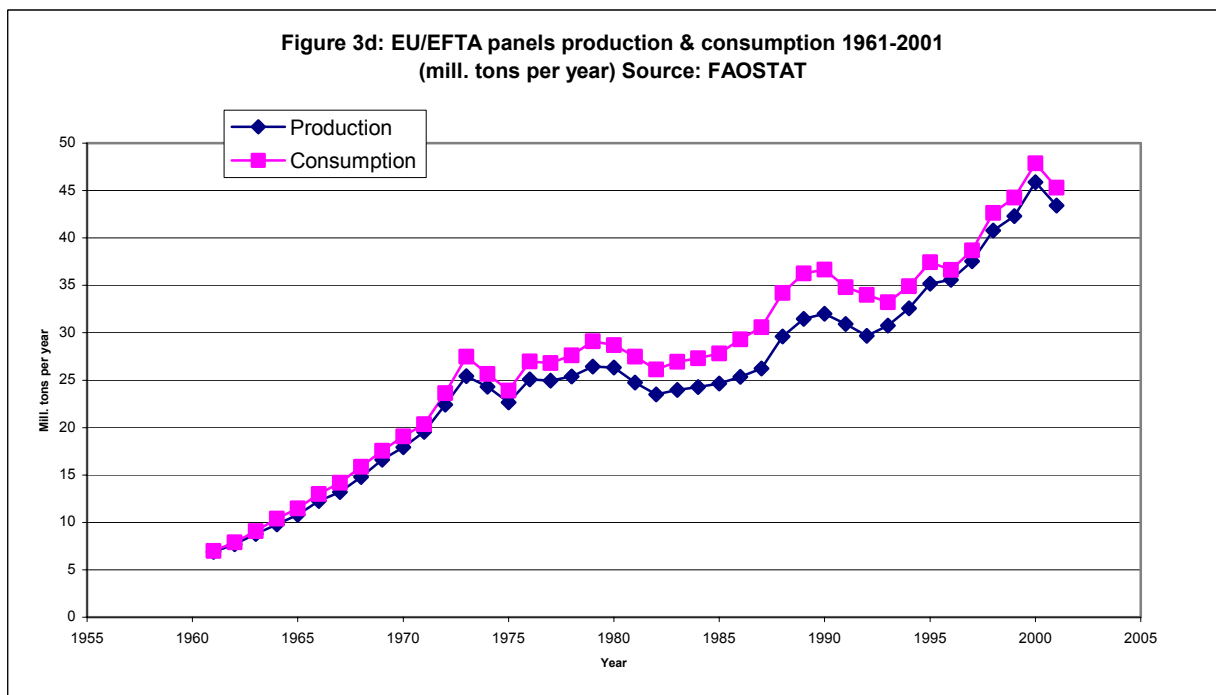
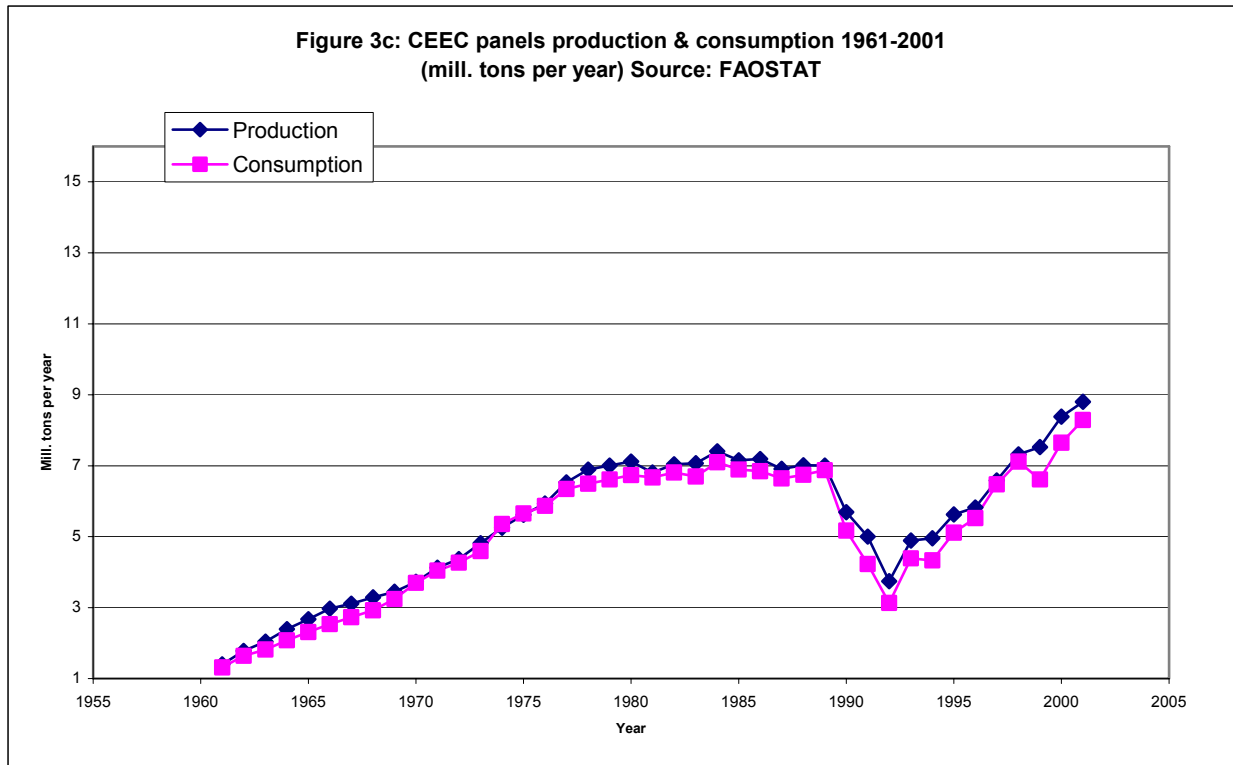


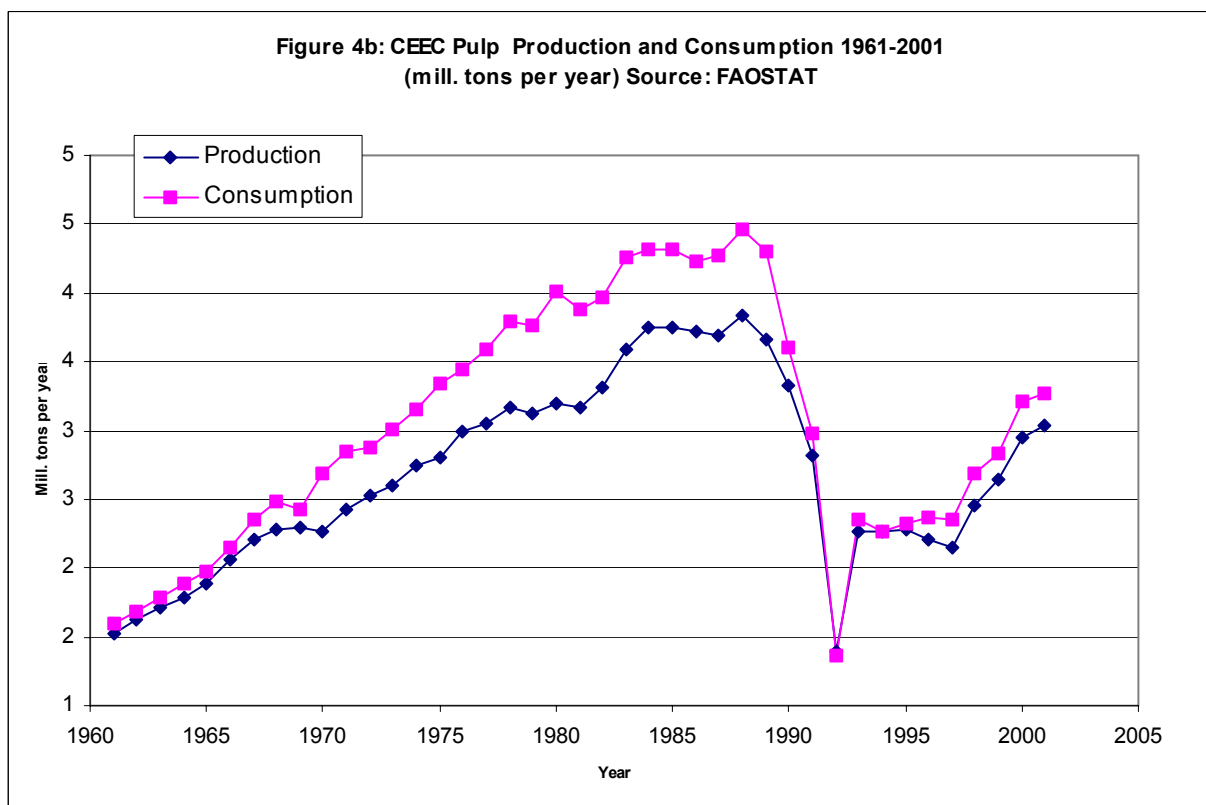
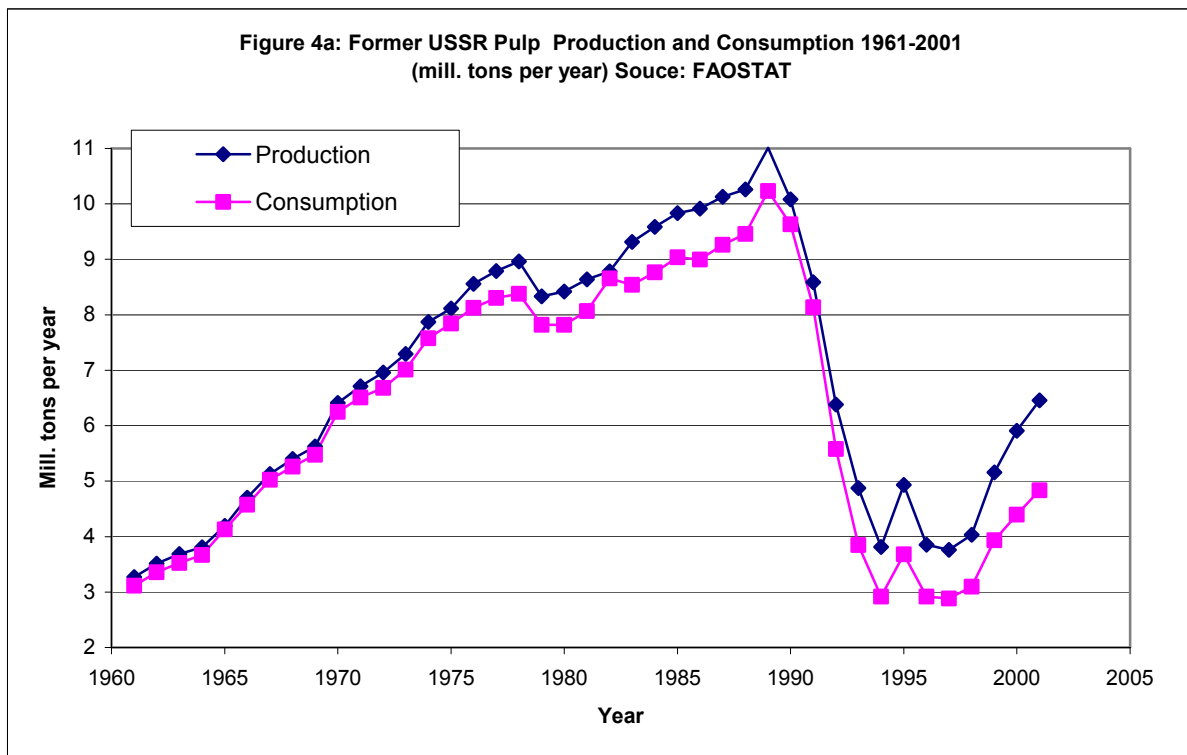


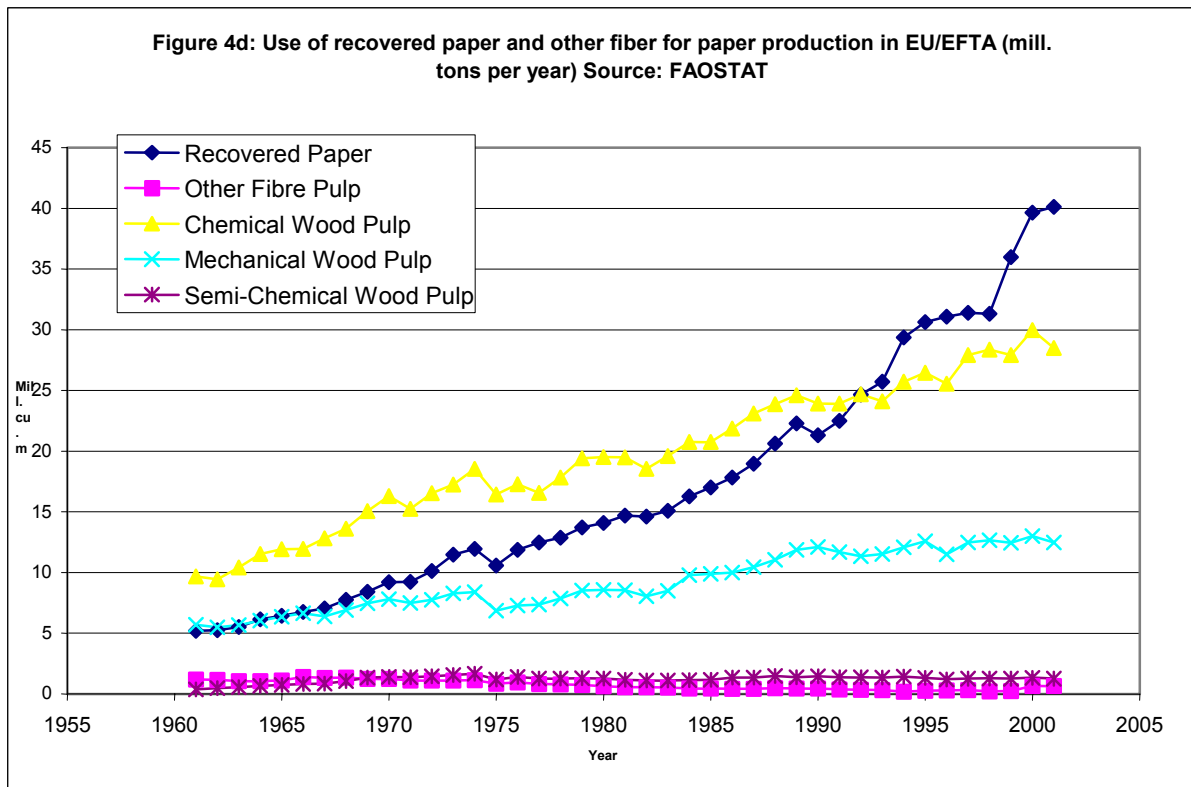
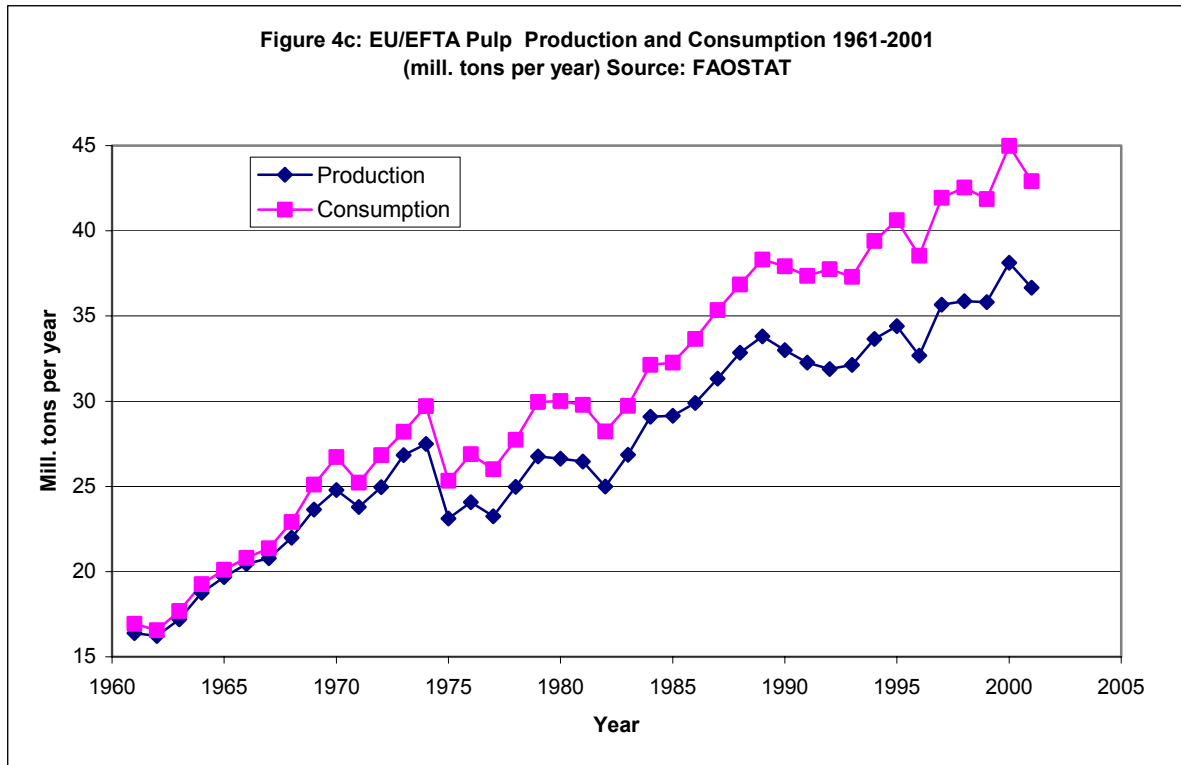


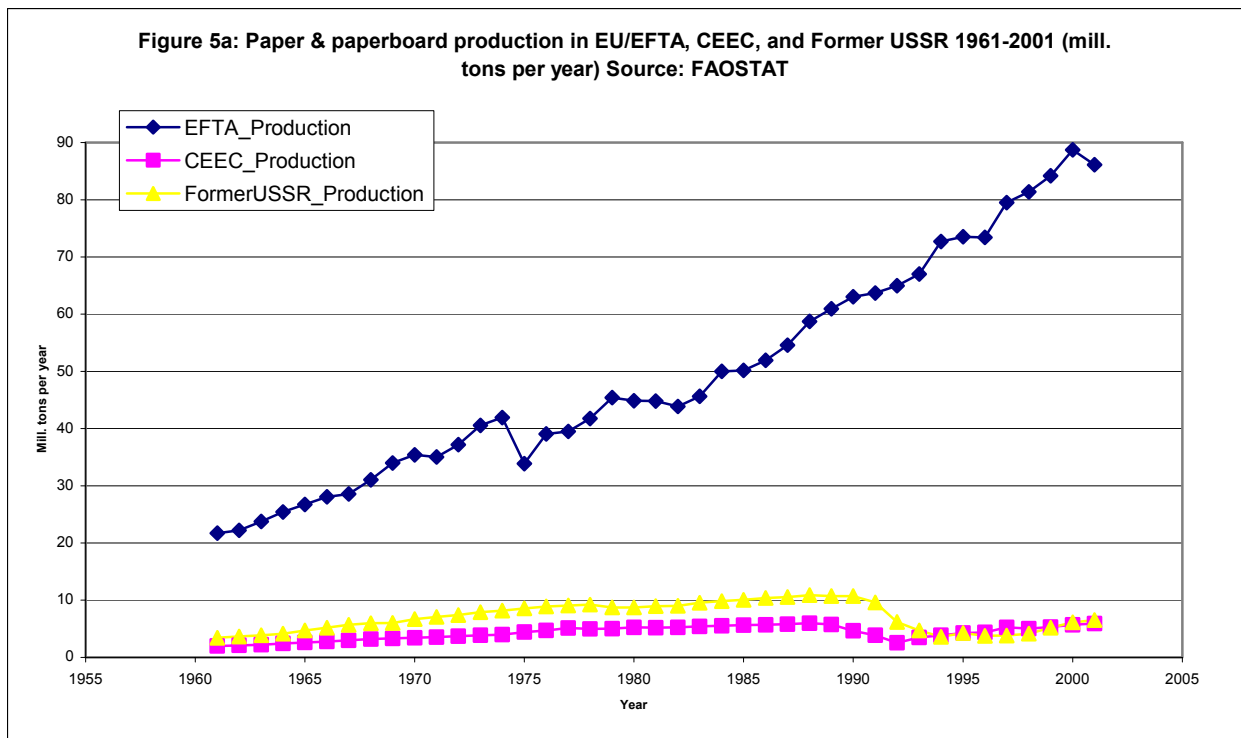
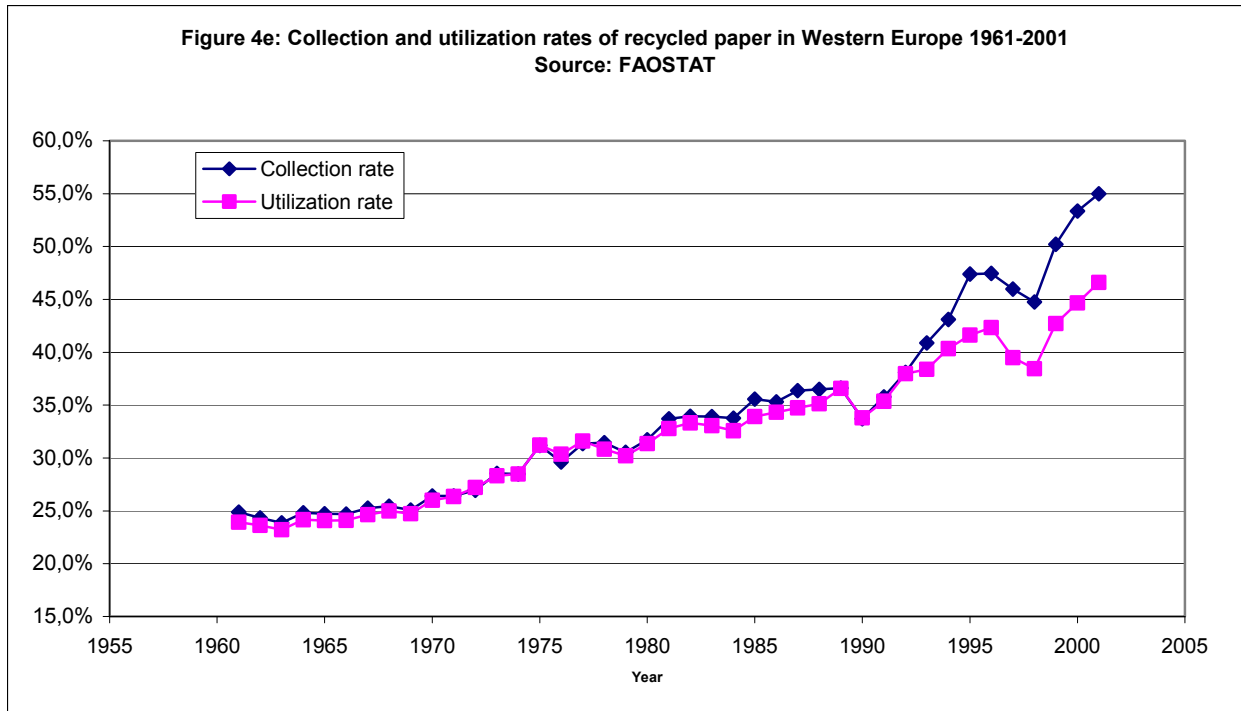


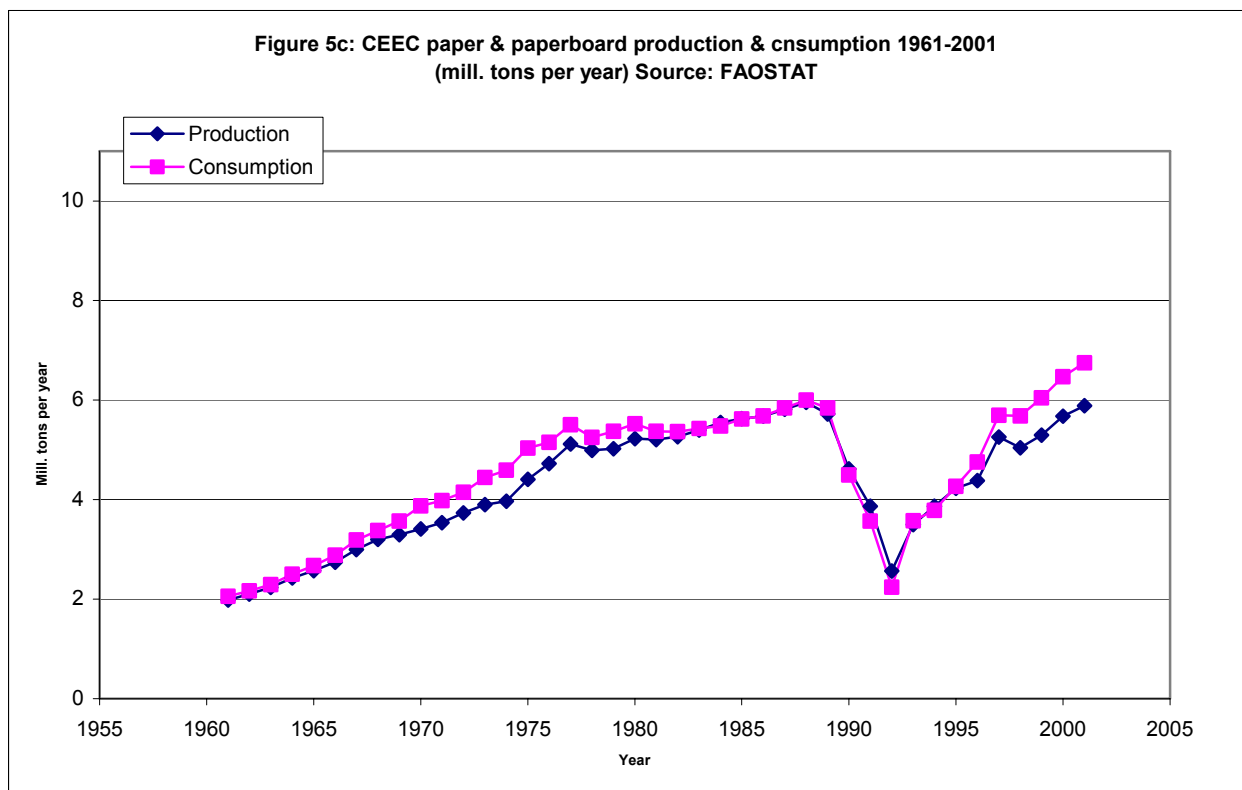
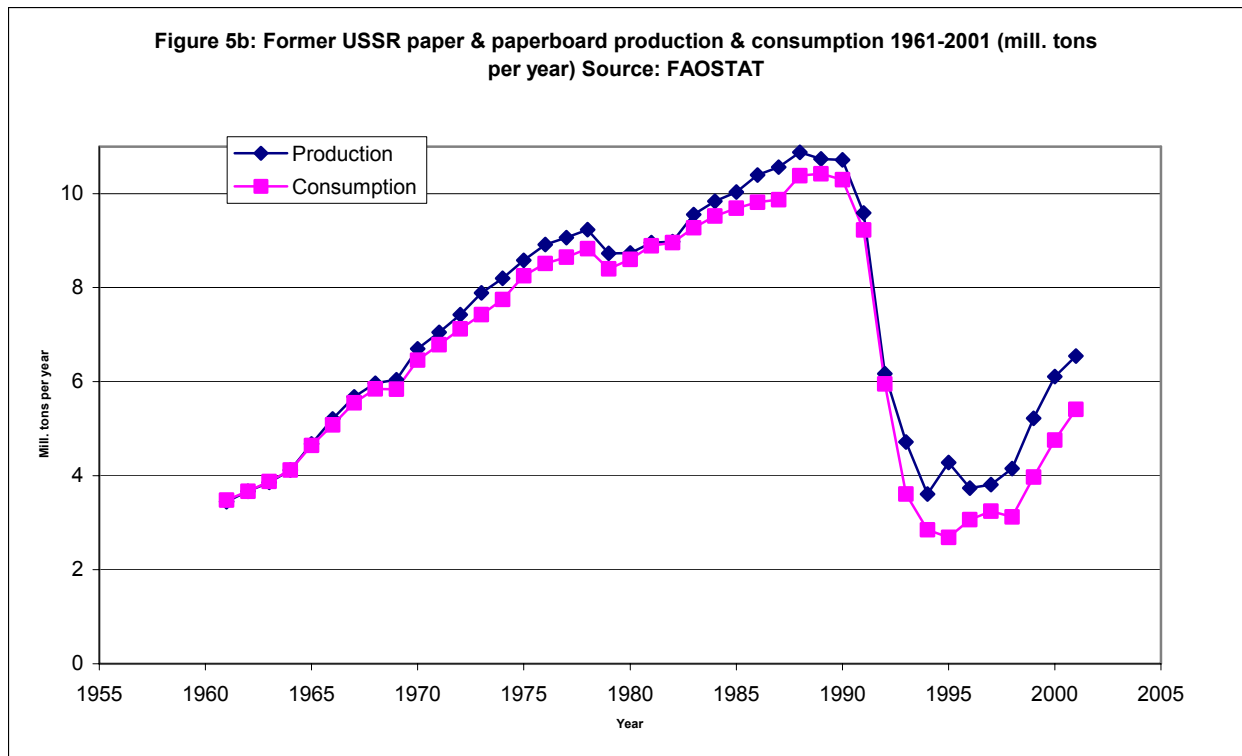


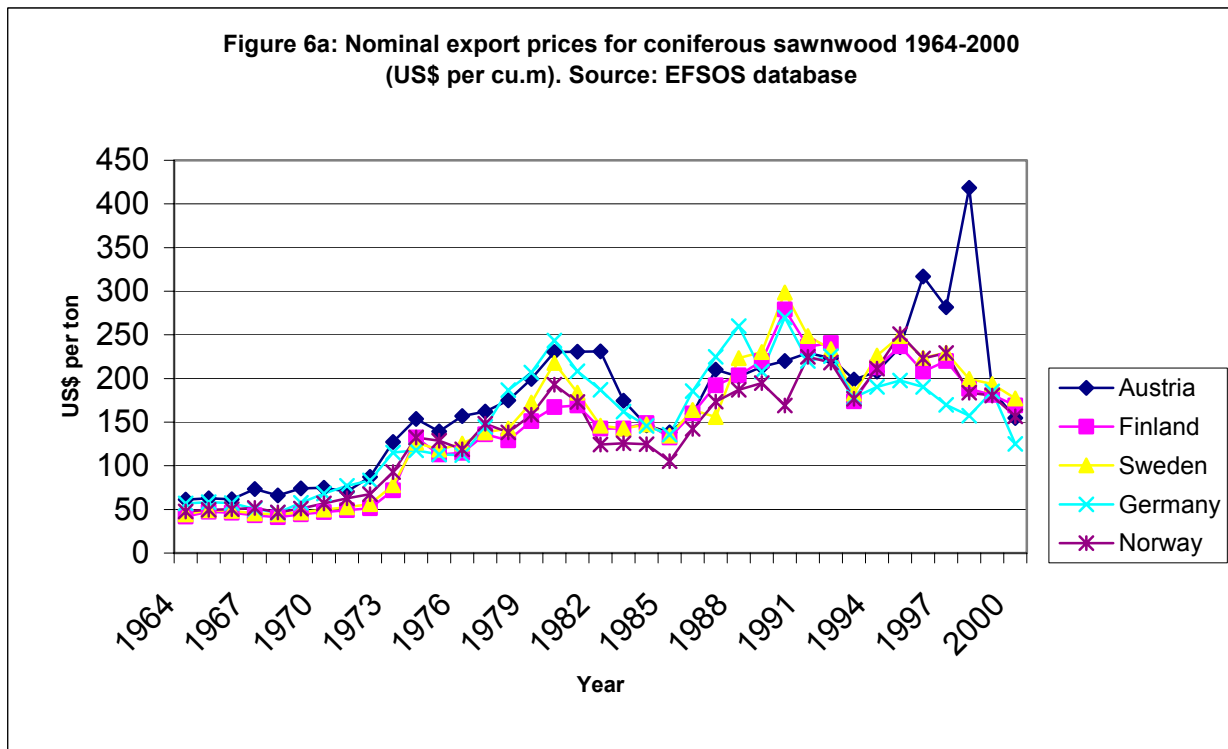
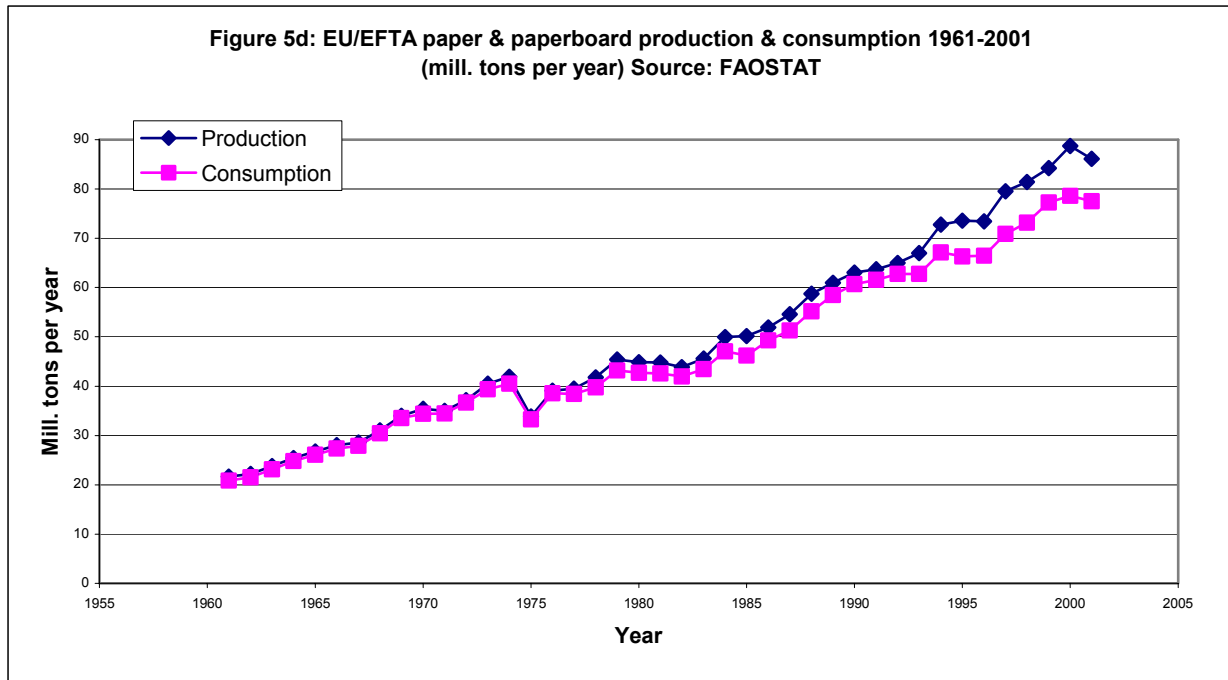


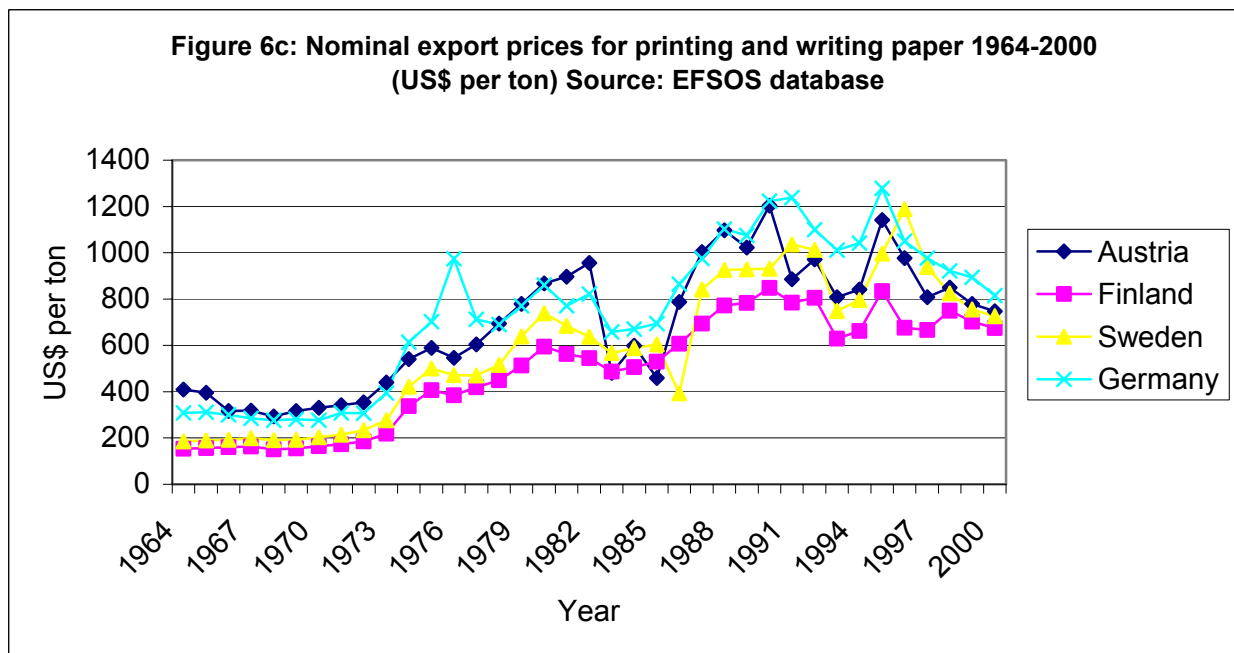
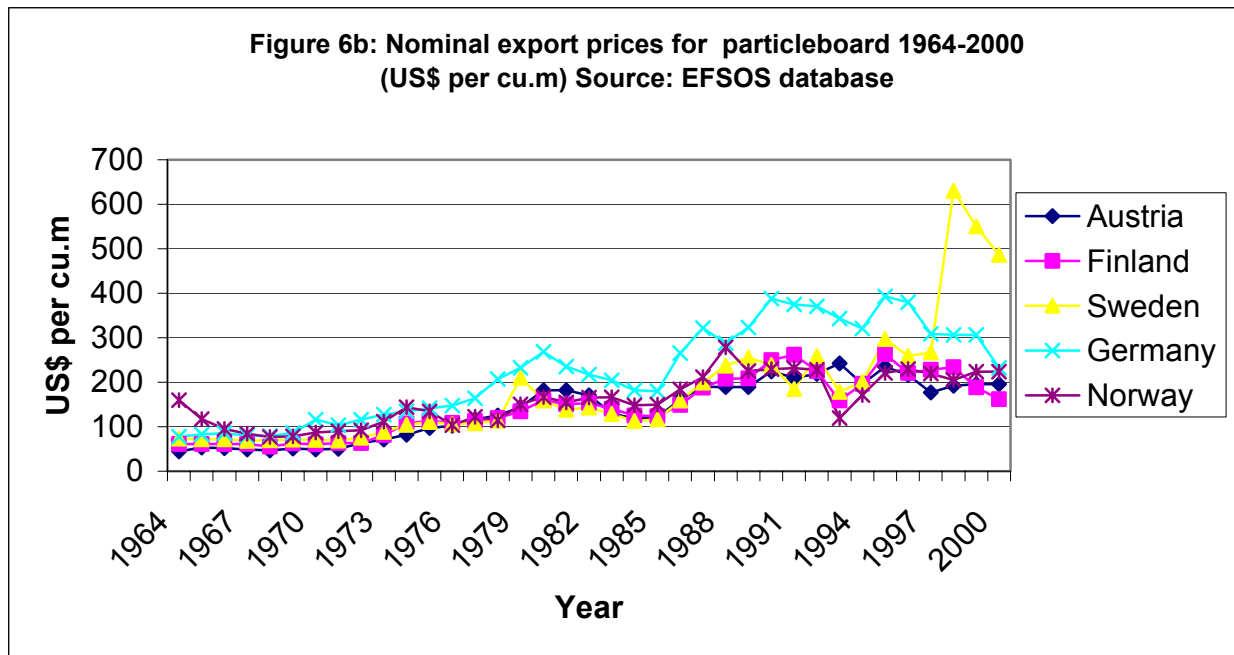












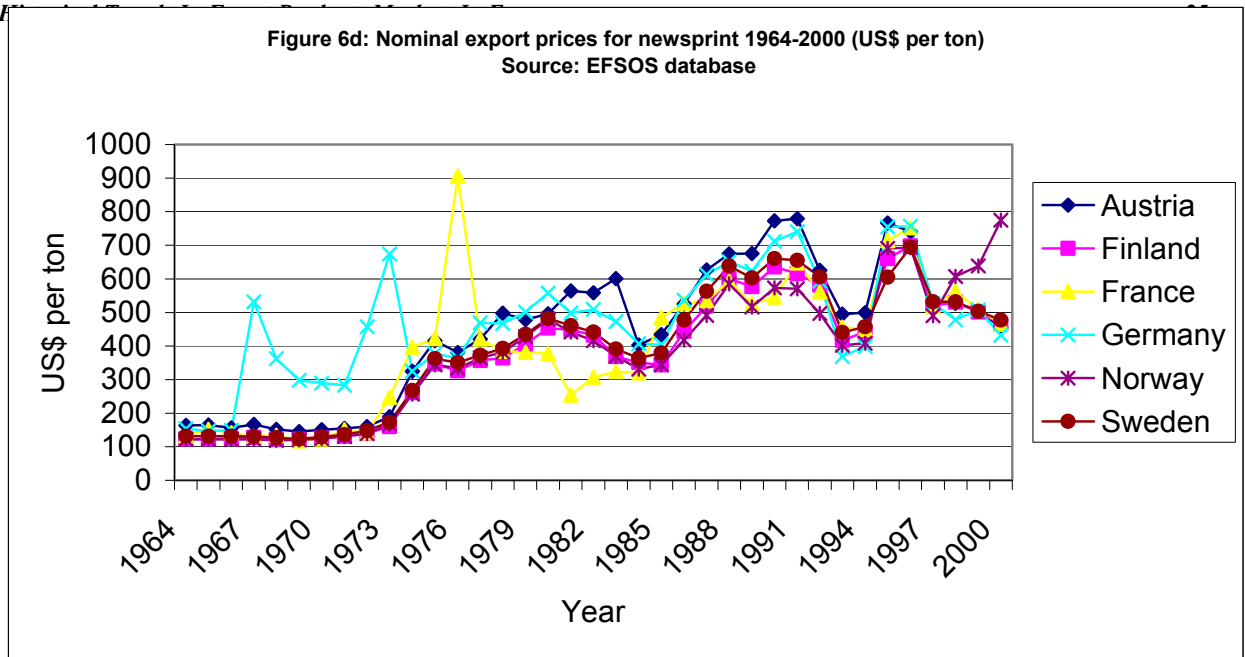
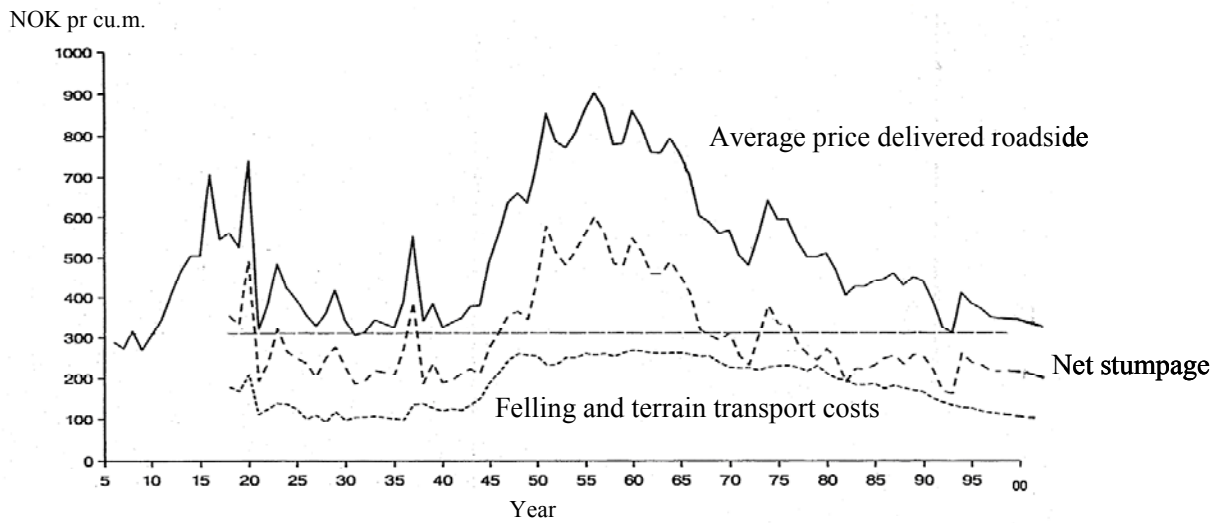
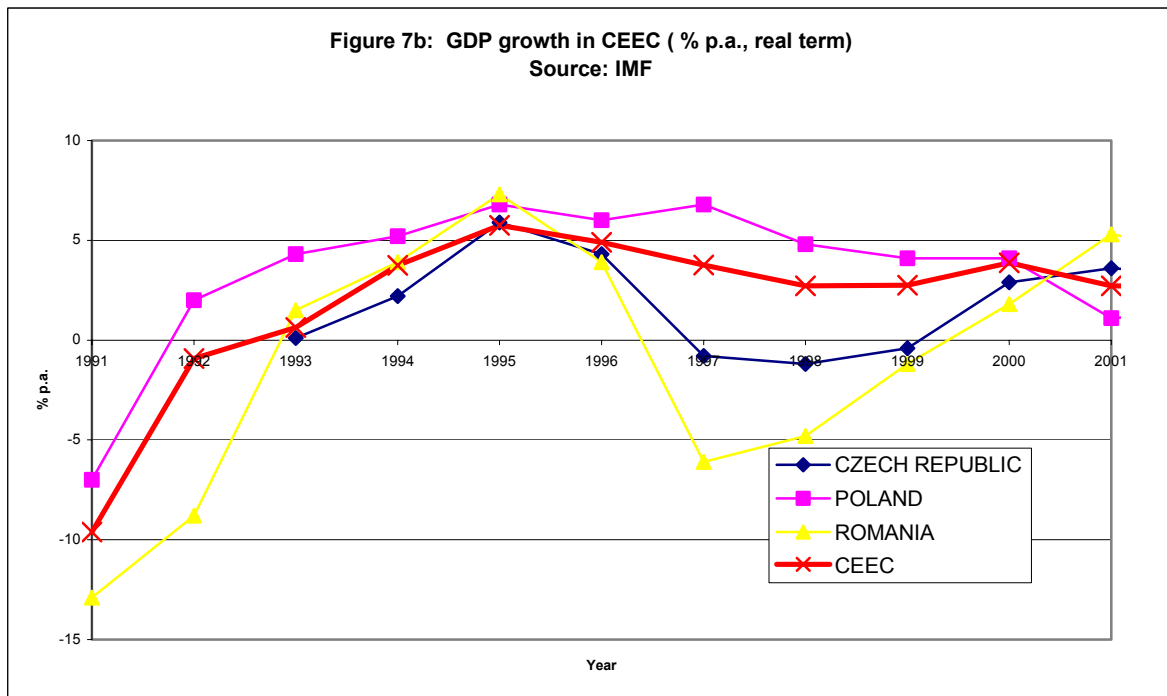
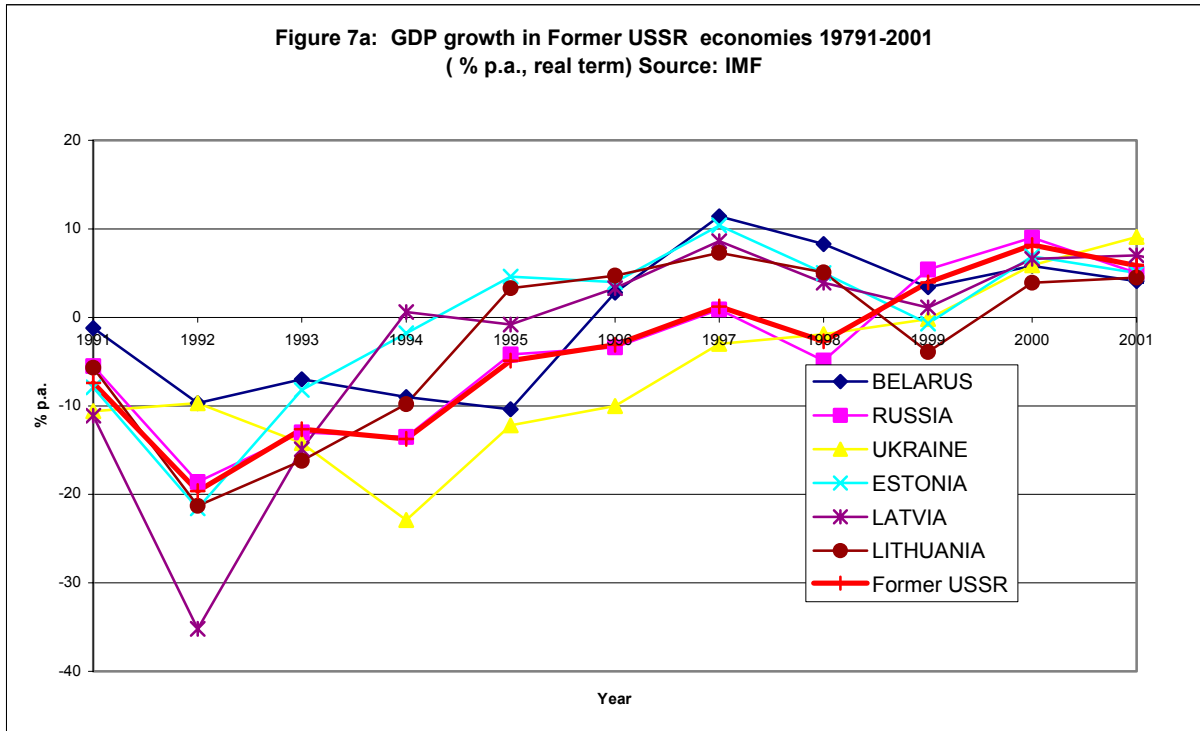
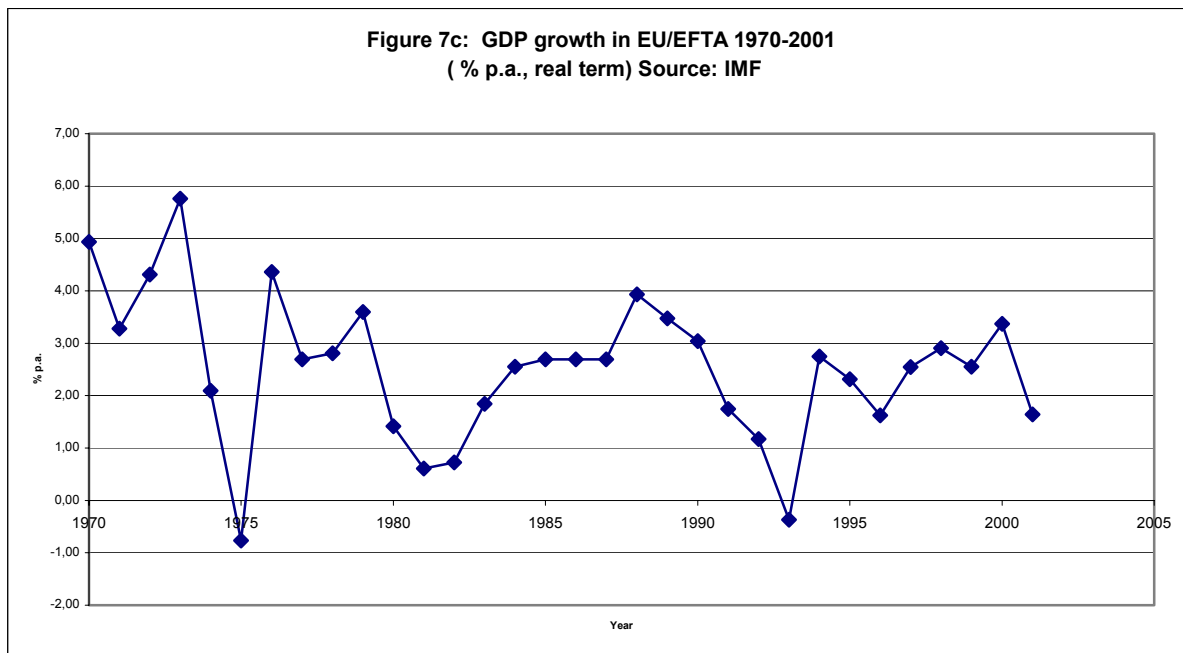


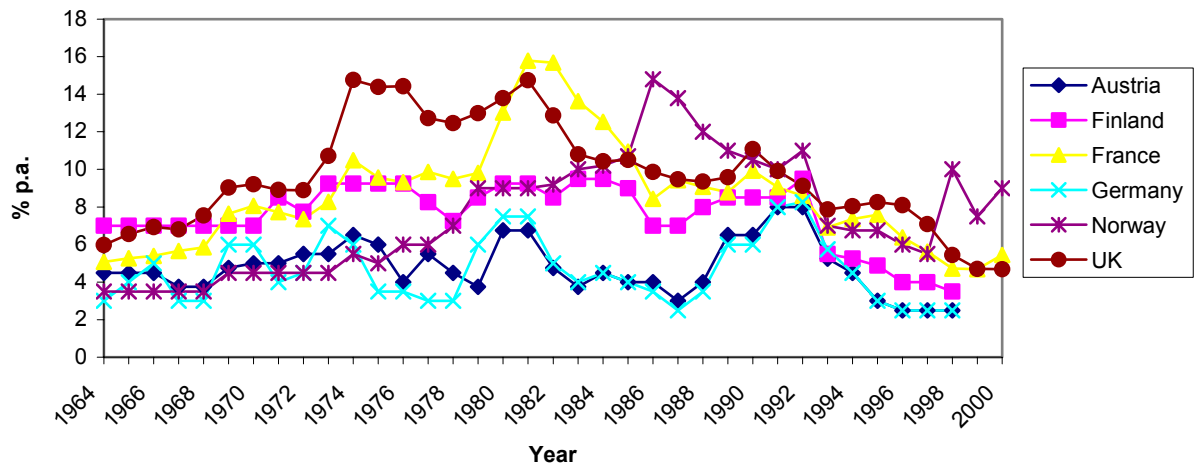
Figure 6e: Roundwood prices and harvesting costs for spruce in Norway 1905-2001. (NOK per cu.m, real 1999 prices) Source: Veidahl(2002)



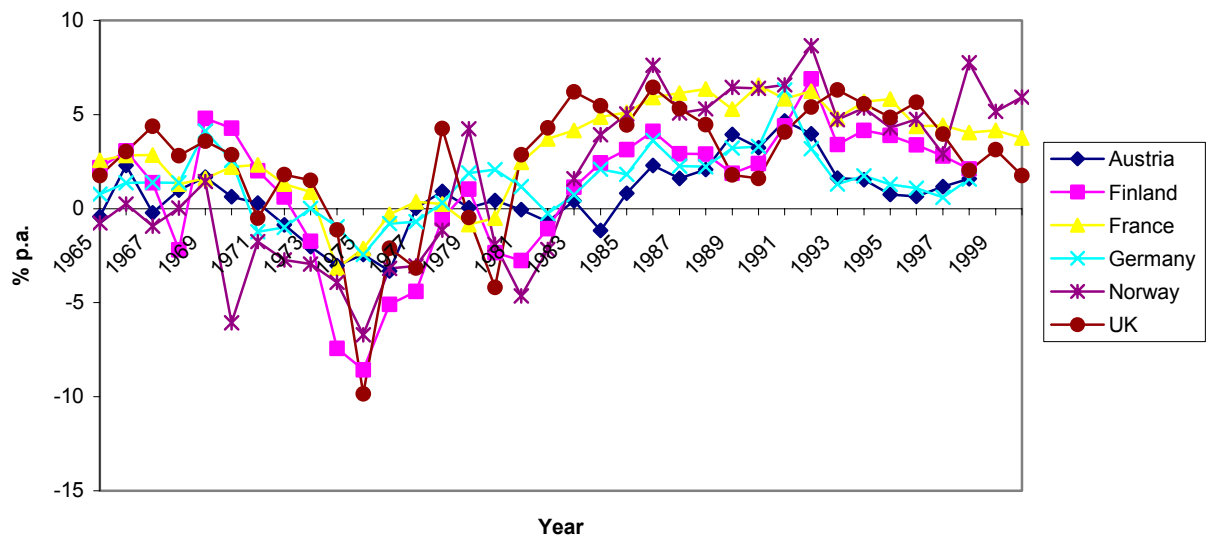


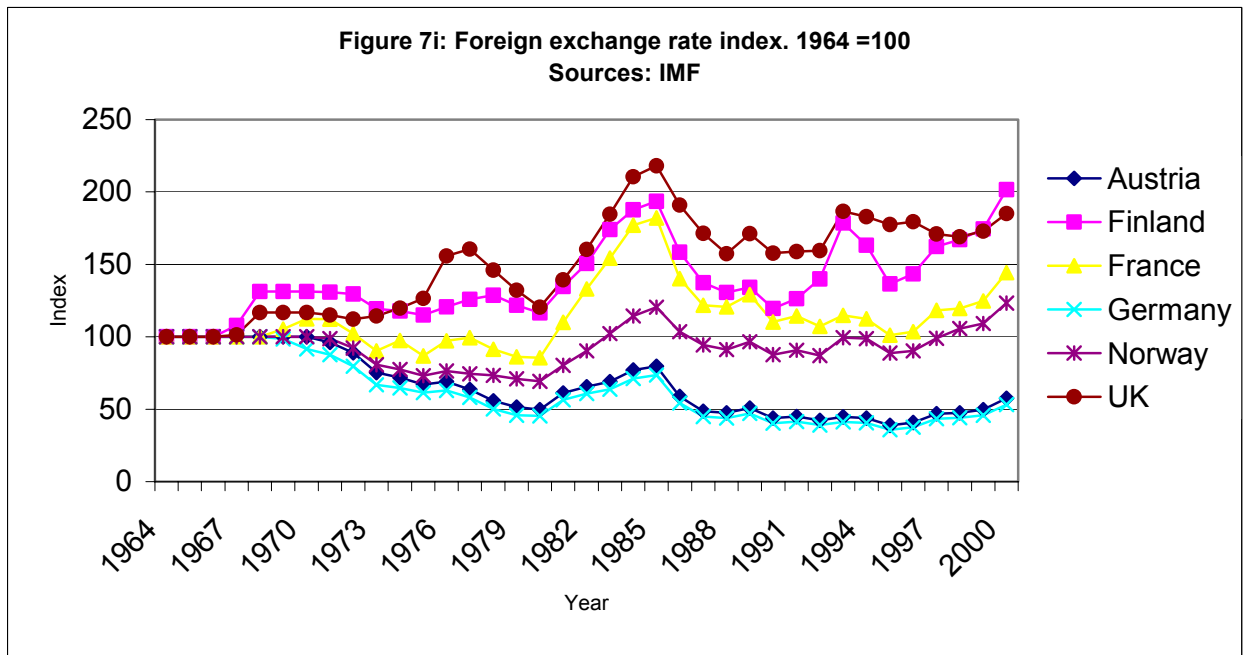
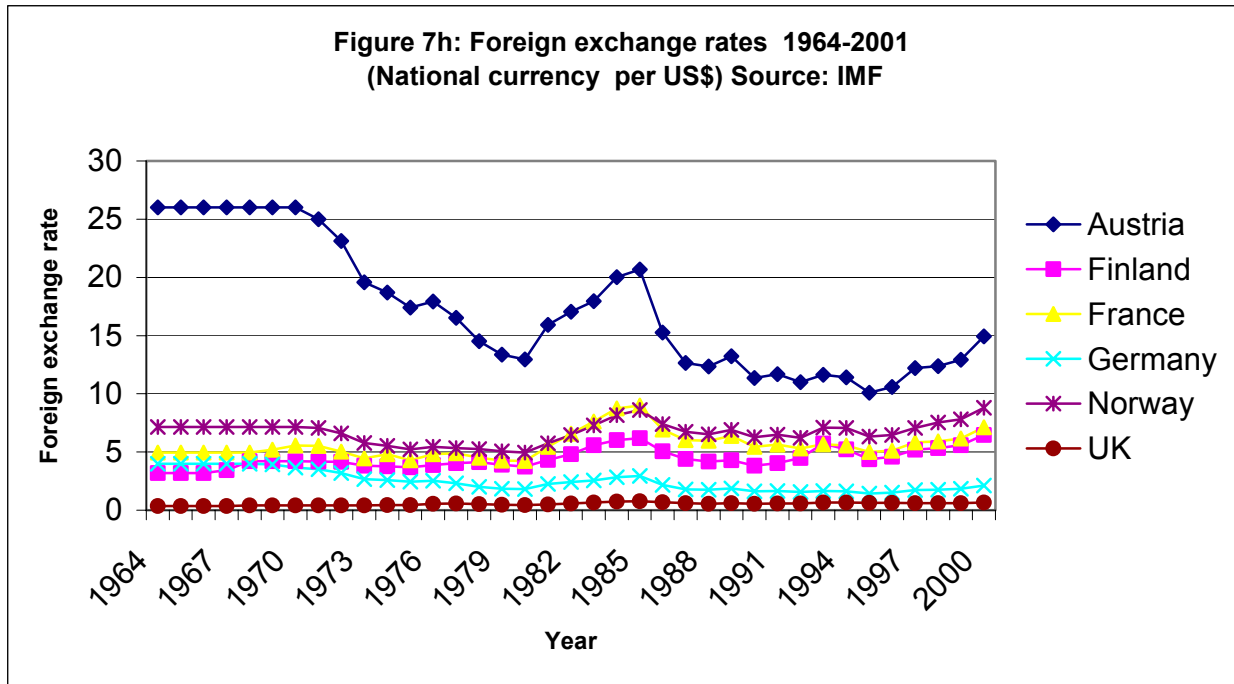


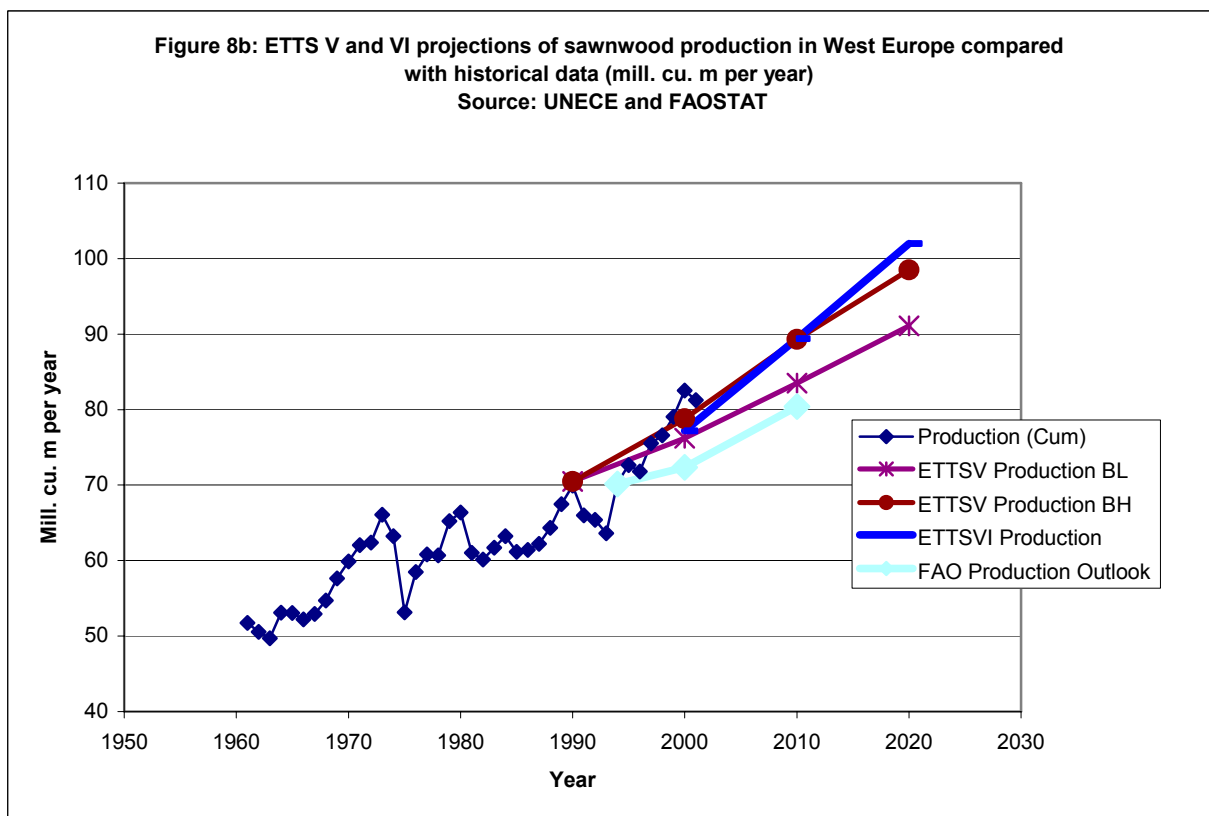
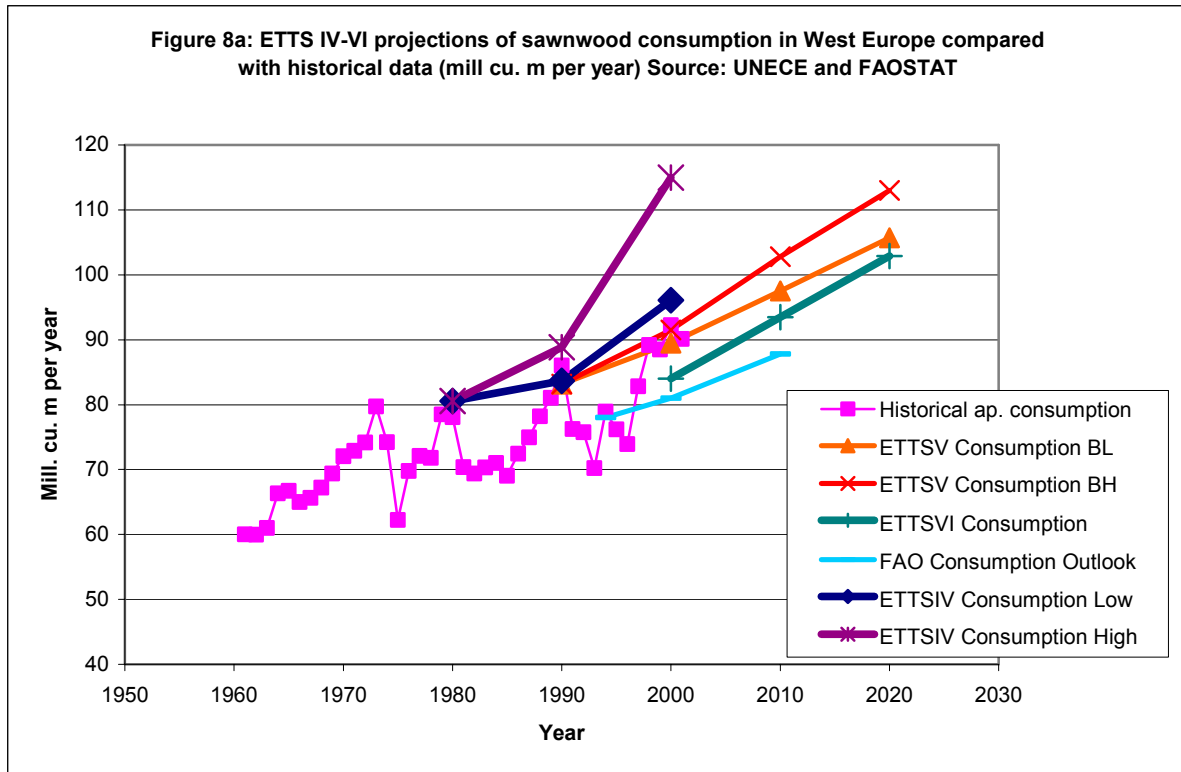
**Figure 7f: Nominal discount rate in some selected countries
(% p.a.) Source: IMF statistics**

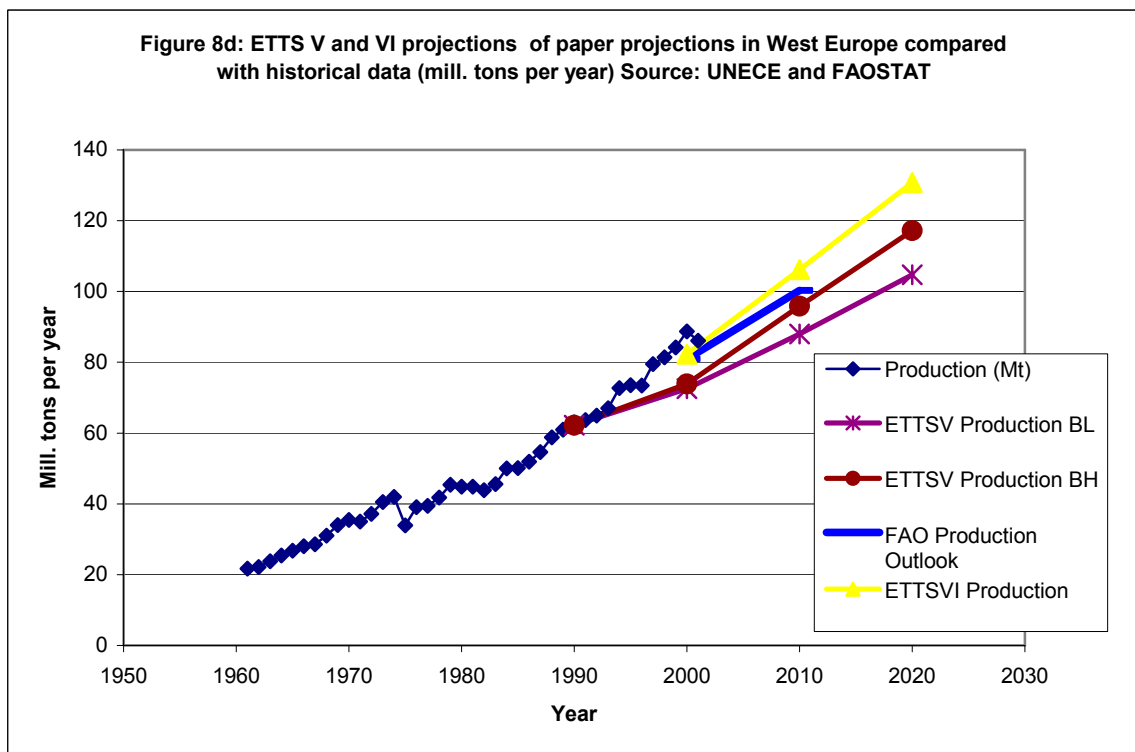
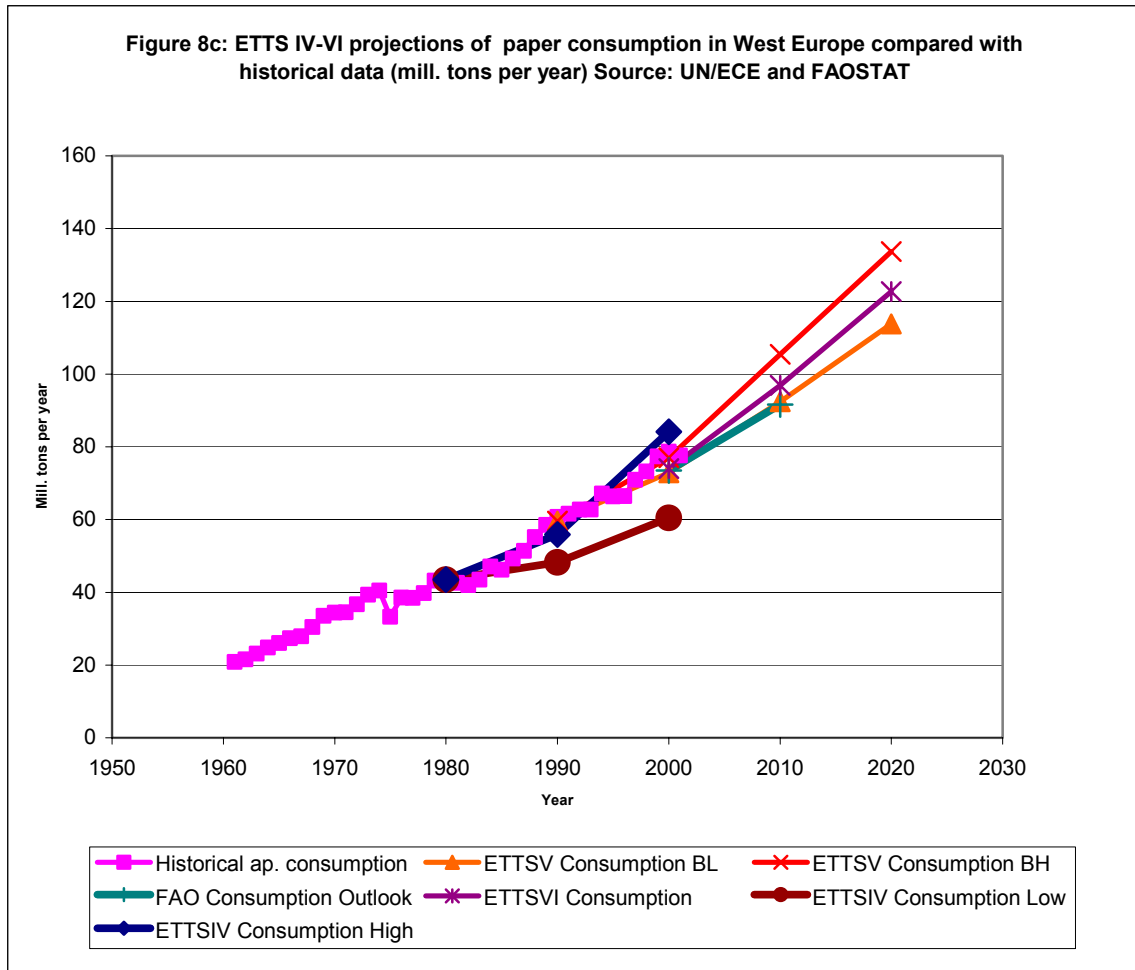


**Figure 7g: Real term interest rate in some selected West European countries
(% p.a.) Source: IMF statistics**









Some facts about the Timber Committee

The Timber Committee is a principal subsidiary body of the UNECE (United Nations Economic Commission for Europe) based in Geneva. It constitutes a forum for cooperation and consultation between member countries on forestry, forest industry and forest product matters. All countries of Europe; the former USSR; United States, of America, Canada and Israel are members of the UNECE and participate in its work.

The UNECE Timber Committee shall, within the context of sustainable development, provide member countries with the information and services needed for policy- and decision-making regarding their forest and forest industry sector ("the sector"), including the trade and use of forest products and, when appropriate, formulate recommendations addressed to member Governments and interested organizations. To this end, it shall:

7. With the active participation of member countries, undertake short-, medium- and long-term analyses of developments in, and having an impact on, the sector, including those offering possibilities for the facilitation of international trade and for enhancing the protection of the environment;
8. In support of these analyses, collect, store and disseminate statistics relating to the sector, and carry out activities to improve their quality and comparability;
9. Provide the framework for cooperation e.g. by organizing seminars, workshops and ad hoc meetings and setting up time-limited ad hoc groups, for the exchange of economic, environmental and technical information between governments and other institutions of member countries that is needed for the development and implementation of policies leading to the sustainable development of the sector and to the protection of the environment in their respective countries;
10. Carry out tasks identified by the UNECE or the Timber Committee as being of priority, including the facilitation of subregional cooperation and activities in support of the economies in transition of central and eastern Europe and of the countries of the region that are developing from an economic point of view;
11. It should also keep under review its structure and priorities and cooperate with other international and intergovernmental organizations active in the sector, and in particular with the FAO (Food and Agriculture Organization of the United Nations) and its European Forestry Commission and with the ILO (International Labour Organisation), in order to ensure complementarities and to avoid duplication, thereby optimizing the use of resources.
- 12.

More information about the Committee's work may be obtained by writing to:

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UN Economic Commission for Europe
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Fax: + 41 22 917 0041
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<http://www.unece.org/trade/timber>

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