

Report

# The Economic Impact of the Forestry and Wood Industry in Europe in terms of the Bioeconomy

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## **1 Introduction**

Forests are important for many and in many different ways with the economy being one of them. Forestry and the wood industry differ across European countries, depending on natural prerequisites, but also because of the economic structure. Studying the economic impact of wood is complicated though by a number of problems which are given in the following lines together with the chosen solution: The wood-industry is a cross-sectional matter which means that it is distributed over many different sectors in the System of National Accounts. Forestry is one sector, production of paper or furniture are the two others. But since furniture is not necessarily made of wood, only a part of the sector can be attributed to wood. Thus, many smaller parts hidden in less obvious economic activities are often overseen and the economic importance of wood is therefore underestimated. To make things worse, so far there is no common definition for wood-related products in the economy. And even if such a definition was available, only the direct effects within the defined sectors are known while the indirect effects generated in the supply network of the forestry and wood industry and the induced effects in the downstream value chain remain unknown. Finally, singular studies in different countries of Europe use different data sets as well. The solution for these challenges is a multiregional satellite account wood and forestry.

A satellite account forestry and wood serves a double purpose: On the one hand, it has a documentation function since it contains all the information on the relevant economic activities and thus forms the basis for determining the economic footprint. On the other hand, it has a planning and simulation function by being able to quantify the effects of alternative strategic business or policy decisions and regulations on value added, employment and tax revenue.

The study will first give a methodological introduction to input-output tables, the concept of (multiregional) satellite accounts and how the economic effects are calculated (Chapter 2). In the third chapter, the four definitions of the forestry and wood industry, which build on each other, are described as well as the used data to identify the forestry and wood-related share of economic sectors. In chapters 4 to 7, the economic impact of forestry and the wood industry in the E-30 (EU-27, Norway, Switzerland and the United Kingdom) is given in terms of gross value added and employment. In chapter 8 the simulation function of the wood satellite account is used to answer the question of the economic impact of a 1% reduction in logging in the E-30.

Results are presented for the E-30 in detail. Results for the EU-27 and country sheets with the absolute and relative size of the forestry and wood industry will be attached in the annex. The detailed list of included categories (using the CPA 2.1 categorisation) is included in the annex.

## 2 Methodology

The traditional official statistics are only insufficiently able to represent the variety of economic interdependencies of the forestry and wood industry, since the relevant data are only available at a very high level of aggregation. Further, the cross-sectional characteristic of the wood industry is not captured in the existing economic statistics which leads to an undervaluation of the economic significance of it.

A satellite system "forestry and wood" - similar to the tourism, culture or sport satellite account - as well as an implementation in a multiregional input-output table for the E-30 (EU-27, Norway, Switzerland and United Kingdom) is a suitable approach to tackle both issues and to identify the economic impact of forestry and the wood industry.

Satellite accounts or satellite systems are extensions to the System of National Accounts (SNA) when the standard accounts (often sectors or goods) follow a classification different to the one needed. However, satellite systems are fully compatible with the economic national accounting making the results comparable with other economic sectors and across countries. The implementation in a multiregional input-output table also allows to identify the indirect and induced effects in addition to the direct effects.

The following sections will give short introductions to the methodologies and concepts that are used in the context of a satellite account "forestry and wood industry".

### 2.1 Gross Value Added (GVA)

Gross value added (GVA) and Gross domestic product (GDP) are among the main measures to capture economic activity. In short, the difference between the two are taxes less subsidies on products<sup>1</sup> which are part of GDP, but not of GVA. These taxes (including non-deductible VAT) and subsidies are applied on any kind of purchased products such as mineral oil or insurances independent of the type of purchaser (either intermediate or final consumer). Therefore, GDP (which includes these taxes and subsidies on products) partially depends on final consumption while GVA does not. As an example, imagine a country raising taxes on care for elderly. The production network remains unaltered, only the final consumer has to pay more. This policy would increase GDP, but not GVA. Because of GVA's closer association with the production process, most research on economic impact tends to use GVA at least during the initial calculations.

To understand what GVA is, a slightly longer explanation may be helpful. The economic activity of a company leads to its output and revenue (also called turnover) which differ

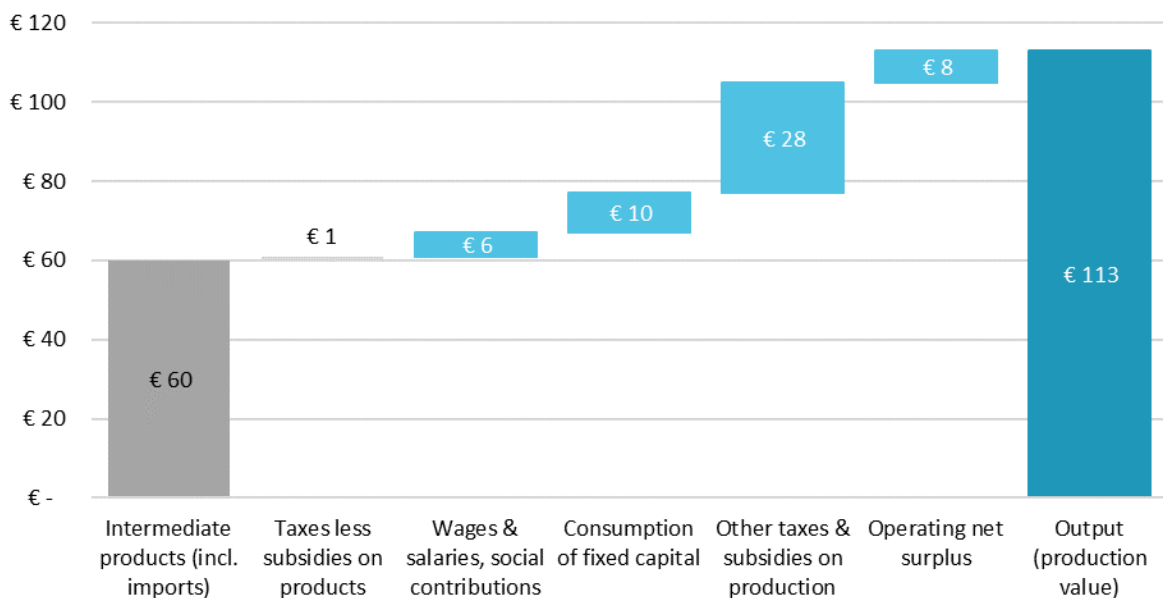
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<sup>1</sup> Products include goods as well as services.

mainly by changes in inventories (everything produced but not sold for revenue is stored in the inventory). Revenue is used to cover a multitude of costs and to produce surplus as shown in Figure 1. Costs fall into two parts:

- on the one hand intermediate goods and services (supplies from other companies, represented by the grey 60 euros column) are required to be further processed within the company and sold to its customers;
- on the other hand, there are the costs of this processing (the darker turquoise bars).

Figure 1: Structure of Gross Value Added



Source: Own figure.

Consequently, two definitions of GVA can be derived: the first explains what is created (supply side) and the second explains what it is used for (use side).

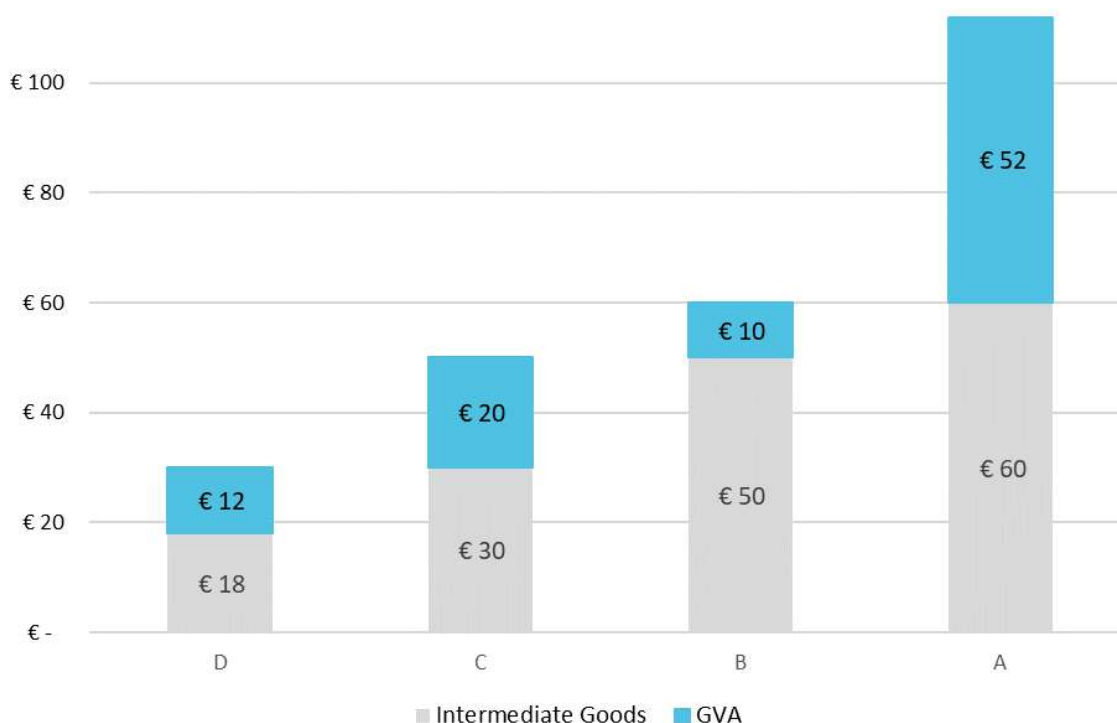
**Supply side:** GVA is the difference between turnover/output (light turquoise rightmost bar) and costs for intermediate products and services including imports (grey) as well as taxes less subsidies on these products (also grey). For example, wooden boards, nails and paint are intermediate goods in the furniture industry. If these intermediate goods are transformed into a table by using labour, machines etc., it can be sold for more than the intermediate goods' price. This additional value is called GVA.

**Use side:** as can be seen in Figure 1, GVA also is the sum of salaries, wages, consumption of fixed capital, social contributions, taxes less subsidies on production, and surplus. Thus, GVA is used to pay the primary production factors: work (wages, salaries, social contributions), fixed capital (consumption of fixed capital), public services (production-based taxes less subsidies), and ownership (surplus).

GDP is calculated by adding the grey column showing 1 euro of taxes less subsidies on products to the 60 euros of GVA.

It is important to appreciate that eventually, all production consists of 100 percent GVA/GDP. To see that, note that the intermediate goods and services worth 60 euros on the left-hand side of Figure 1 have to be produced by other companies (the suppliers). During this production in the supply network, GVA is generated as well. This happens again in the suppliers of the suppliers and so on and so forth.

*Figure 2: Value creation in the value chain (without imports)*



Source: Own figure.

Company A in Figure 2 shows the company analysed in Figure 1 in the rightmost bar. The 112 euros output (without the 1 euro taxes less subsidies on products) are divided into 60 euros intermediate goods; 1 euro taxes less subsidies on products; and 52 euros GVA.

However, intermediate goods need also to be produced somewhere in the upstream value chain. In this example, they can be split up into 10 euros of GVA in the direct supplier company B and 50 euros intermediate goods and services. Following this logic, the intermediate cost of company B equals to 20 euros GVA and 30 euros intermediate goods and services by company C. This process is repeated over and over until the whole original output is attributed to GVA at some stage of the production chain.

The above process is interrupted when goods from a foreign supplier are purchased. In this case, the GVA generated cannot be accounted for in the domestic economy anymore. Because of this, the share of the domestically generated GVA in the original expenditure is an important indicator of the wood and forestry economy. Large economies (or collections of economies, as the European Union is) typically have higher domestic shares since they produce more on their own and need to import less. The assumption that in companies A to D are domestic and all intermediate goods for company D are imported, would lead us to a domestic GVA of  $52 + 10 + 20 + 12 = 94$  euros. The original expenditure equals 112 euros, therefore, the share of domestic GVA can be calculated as  $94 / 112 = 83.9$  per cent.

One can go a step further and compare the GVA generated in company A which is directly related to the wood and forestry (direct effect) to the total GVA effect (including effects in the domestic upstream value chain of suppliers). In the example, we find a value of  $94 / 52 = 1.81$ . This value is called the GVA multiplier and tells the reader that for every euro of GVA in company A another 81 cent of GVA are generated in the domestic supply network. The higher this value, the better the specific company is embedded in the domestic economy.

This scheme allows us to differentiate between

- Direct effects taking place within the analysed companies and sectors and
- Indirect effects, generated in the supply network of the analysed companies.
- Induced effects are a third category. Persons who are directly or indirectly employed (see below) receive an additional net income compared to alternative unemployment, which is again partly spent by the employees on domestic goods and services after taxes and social contributions, the savings rate, imports and consumption abroad are subtract. The remaining net-stimulus on domestic final demand is referred to as induced effect.

## **2.2 Employment**

In order to process intermediate goods, companies need labour with persons being either employed or self-employed. Typically, there is a strong correlation between GVA and employment within a sector. Also, the concepts just shown for GVA can be applied to



employment in a very similar manner. That means that we can differentiate between employment generated directly in the wood-related company and indirectly in the supply network. Employment data is taken from Eurostat in order to keep the values comparable.

Due to the lack of available data, the employment effects are presented exclusively in heads (independent of the employment level in hours) and not in full-time equivalents (conversion in such a way that 1 full-time-equivalent corresponds exactly to one person employed at 100%).

### **2.3 Input-output tables**

The just mentioned calculations of GVA and employment in their direct and indirect form are typically done by using input-output tables (IOT), which are part of our national accounts. IOTs are basically systems of linear equations describing the distribution of economic activities and their linkages across the economy.

An input-output table has a matrix-like structure. Figure 3 is a simplified IOT for a single country with exemplary data. The most important areas are coloured:

- Intermediate goods matrix: top left, orange;
- Final consumption: centre top, blue;
- Gross value added: centre left, purple;
- Total use: top right, green;
- Output: lower left, green.

Please note that the vectors containing the sums are also coloured, but use boldface letters.

*Figure 3: Simplified input-output-table (exemplary data)*

		Interm. goods output				Sum final consumption			Total Use	
		Good 1	Good 2	Good 3		Private cons.	Public cons.	Investments		
Good 1		1	2	1	4	5	0	6	11	15
Good 2		3	17	10	30	10	0	10	20	50
Good 3		0	10	10	20	5	5	5	15	35
<b>Total interm. Consumption</b>		<b>4</b>	<b>29</b>	<b>21</b>	<b>54</b>	<b>20</b>	<b>5</b>	<b>21</b>	<b>46</b>	<b>100</b>
Cons.fixed cap.		1	2	3	6					
Other taxes		3	4	3	10					
Employ. Comp.		5	13	5	23					
Surplus		2	2	3	7					
<b>Gross value added</b>		<b>11</b>	<b>21</b>	<b>14</b>	<b>46</b>					
<b>Output</b>		<b>15</b>	<b>50</b>	<b>35</b>	<b>100</b>					

Source: Own figure.

The **intermediate goods matrix** reports how much of each good is necessary for the production of each good. Sources are given in the rows, destinations in the columns. Therefore, for the production of good 1 (first column) 1 unit of good 1 is required, 3 units of good 2 and nothing of good 3. Imports – not shown here – are reported just below the intermediate goods and are treated very much like them.

New goods and services cannot be created with intermediate consumption alone. For this, one essentially still needs labour (Compensation of employees) as well as machinery and equipment (consumption of fixed capital) and an entrepreneur whose entrepreneurial risk is compensated by a profit (surplus). These components are therefore to be attributed to intermediate inputs in the production process and are found in the value added quadrant.

As everything which is produced has to be used in some way (even if it is merely stored somewhere), these 15 units of output of sector 1 have to be booked in the same sector's row: it sold 1 unit to itself, 2 units to sector 2 and 1 unit to sector 3, therefore it produced a total of 4 intermediate goods. In addition to that it also produced 11 units for final use (5 private consumption, 6 capital formation and changes in storage and inventories as well as exports – not shown here). The 4 units of intermediate use plus final use of 11 units thus equal 15 units of total use which are equal to the output of good 1. Therefore, the numbers in the lowest row are equal to the numbers of the rightmost column.

Real IOTs feature a much larger number of sectors, usually around 65 on the EU-level, and a more detailed accounting structure.

## **2.4 Input-output analysis: direct, indirect and induced effects**

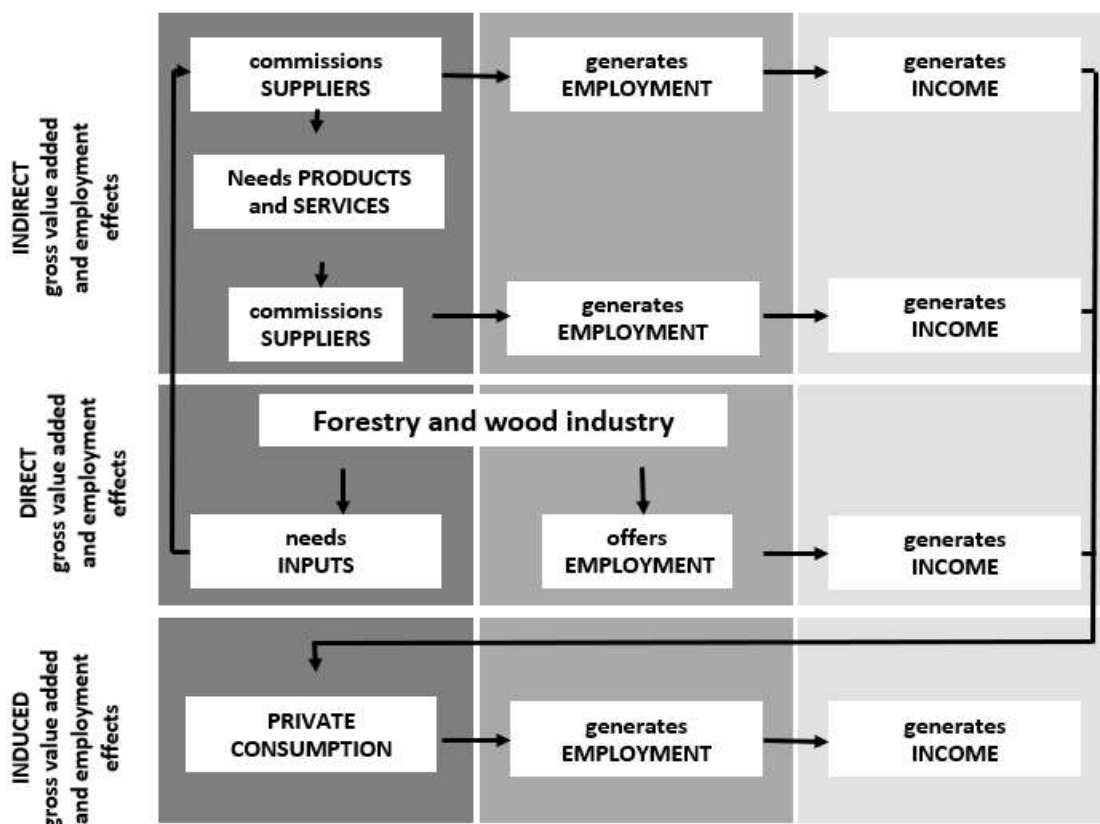
As already mentioned, to produce a certain good or service other goods and services are needed as inputs, those goods and services need inputs as well and so on. The intermediate goods matrix as described above reports how much of each good is necessary for the production of each good. Thus, input-output tables allow to calculate the indirect effects which are triggered by the direct effects and allows to calculate indirect and induced effects based on the quantified direct effects.

Figure 4 shows the logic behind direct, indirect and induced effects for the forestry and wood industry.

The size of direct, indirect and induced effects (total effect) in relation to their direct effects is called the multiplier. It is an indicator of how well a company or sector is embedded within the rest of the economy. The higher these effects are, the stronger are links between the sectors. If multipliers are small, the company either does not need a lot of intermediate goods or it imports them. Please note that therefore one has to interpret multipliers with care. It is easily possible that a very important sector has small multipliers, like education. As most costs are for wages and salaries while purchases of intermediate goods are comparatively small, multipliers must be low due to the high direct value-added effect. However, without proper education, the forest- and wood-related industry – and all others – would come to a stand-still sooner or later. Also, companies may buy their suppliers. In this case, the previously indirect effects of the supply chain move into the direct effect of the directly wood-related company leading to a smaller multiplier.

Multipliers are almost always larger or equal to one. In single countries, a typical multiplier for a manufacturing sector would be around 1.5. As large countries produce more goods and the need for imports is less, they also tend to have slightly larger multipliers. Service sectors usually require fewer inputs and are at the same time more value-intensive, so that the multipliers here are usually lower than in manufacturing sectors.

Figure 4: Direct, indirect and induced effects



Source: Own figure.

## 2.5 Satellite Accounts

Input-output tables thus provide important information for the calculation of intermediate consumption effects, but for certain questions they are not detailed enough. In order to make this information visible, more detailed input-output tables are developed where the more detailed parts are called “satellite accounts”.

A satellite account is an instrument for the representation of cross-sectional matters in a way that conforms to the System of National Accounts. As a modern instrument, it bears this name because it orbits the national accounts system like a satellite from a 360° perspective. In the process, the shares of economic activity relevant to the analysed matter is extracted from each individual sector (account) of the national accounting framework and collected in a separate account – the satellite account. A satellite account is structured much more deeply in the area to be analysed than the IOTs provided by national statistics.

Figure 5: IOT extended by a satellite account for the forestry and wood industry (grey)

		Intermediate goods						Σ	Final consumption					Total use
		Good 1	Good 2	Forestry	Wood products	Paper	Furniture		Private consumption	Government	Investment	Changes in inventories	Exports	
Intermediate goods	Good 1	7	2	2	1	0	0	12	25	2	1	0	3	43
	Good 2	5	15	4	2	1	1	28	5	7	5	2	10	57
	Forestry	3	3	11	4	2	2	25	8	12	0	0	2	47
	Wood products	1	3	4	1	0	0	9	0	6	0	0	0	15
	Paper	0	2	3	0	1	0	6	0	2	0	0	0	8
	Furniture	1	2	2	0	0	1	6	0	2	0	0	0	8
Σ domestic inputs		17	27	26	8	4	4	86						
Import of inputs		5	8	1	0	0	0	14						
Inputs total		22	35	27	8	4	4	100						
	Wages, salaries	12	9	18	5	3	3	50						
	Taxes, subsidies	2	3	0	0	0	0	5						
	Consumption of fixed capital	6	5	2	2	1	1	17						
	Operating surplus	1	5	0	0	0	0	6						
Σ Gross Value Added		21	22	20	7	4	4	78						
Output		43	57	47	15	8	8	178						

Source: Own figure.

The aggregate values of the standard IOT and the satellite account are the same but relevant production shares and relevant other parts of the accounting framework are depicted separately. The so obtained expanded IOT follows the same regulations and principles as any standard IOT. Its advantage is that forestry and wood-related economic activity is well defined in separate, “clean” sectors (i.e. without activity unrelated to forestry and wood) which can be treated like any other sector. The IOT with the satellite thus serves as a “zoom” into the details of forestry and the wood industry.

Due to the full compatibility with the national accounts, a comparison of important macroeconomic aggregates of the forestry and wood industry (gross value added, employment, etc.) with macroeconomic aggregates of other economic sectors or the overall economy is possible.

Beyond their primary documentation function, satellite systems take on particular importance in their simulation function – e.g. when used for the purpose of evidence-based policy formulation. In particular, satellite accounts can be used to perform specific regional and macroeconomic simulation analyses. By varying certain parameters, the effects of, for example, regulatory or subsidy-related interventions can be precisely mapped and the effects on the forestry and wood industry can be evaluated.

This application option is particularly useful in the development of robust decision-making criteria for strategy processes, when possible effects of changes in the regulatory framework in the legislative process, changes in a funding regime or investments in new technologies are to be considered.

In order to study international production relations in the same style as domestic Input-Output-analysis, it is necessary to link the single national (or more general “regional”) IOTs into one multiregional IOT (MR-IOT).

Firstly, with the intention to analyse forestry and the wood industry, IOTs for wood (IOTs:W) were created for all 30 states. Then, in order to calculate E-30-wide indirect effects, these 30 IOTs:W were merged into one multiregional IOT:W (MR-IOT:W). This is possible because an IOT:W can be treated in exactly the same manner as a normal IOT.

The MR-IOT:W below consists of the national IOTs:W along the main diagonal from upper left to lower right. They are shaded a little darker than the rest. The remaining, light part of the intermediate goods matrix is foreign trade between the specific sectors of the various regions. GVA and final demand are placed below and to the right as usual.<sup>2</sup> The row and column designated “Import RoW” and “Export RoW” represent residual foreign trade with the rest of the world (i.e. model-extern).

This MR-IOT:W therefore contains 30 forestry-sectors (one for each country), 30 paper-sectors, and so on. Although they each refer to a different country, mathematically they are treated in the same way as the sectors of a single-region IOT.

The basis for the MR-IOT:W produced here is the FIGARO (“Full International and Global Accounts for Research in input-Output analysis”) produced by Eurostat<sup>3</sup>. This is a MR-IOT for the EU-27 plus many more other countries and is thus the optimal starting point for the MR-IOT:W.

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<sup>2</sup> Final demand is more complex than in the domestic case though, as goods for final demand in one region may come from a different region. Thus, there actually is a final demand matrix for every combination of regions and sectors.

<sup>3</sup> <https://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/figaro>

Figure 6: Satellite System (S) embedded in a multiregional input-output table

		Region 1				Region 2				Region 3				Σ	Final Consumption	Export RoW	Total Use
		Good				Good				Good							
		1	2	3	S	1	2	3	S	1	2	3	S				
Region 1	Good	1															
		2															
		3															
		S															
Region 2	Good	1															
		2															
		3															
		S															
Region 3	Good	1															
		2															
		3															
		S															
		Σ															
		Import RoW															
		Taxes less Subs. Products															
		Gross Value Added															
		Output															

Source: Own figure.

### 3 Definition and Data

So far, no commonly used and harmonised statistical definition of forestry and the wood industry exists. Although forestry is classified separately in the economic classification systems, the wood industry as such is a cross-sectional and part of many other branches and sectors (e.g., construction based on wood is part of the general construction industry). Thus, the actual economic size of forestry and the wood industry are unknown and using only the effects of forestry would underestimate the economic importance of wood substantially.

There are many definitions of the forestry and wood industries which differ fundamentally in their breadth and depth of coverage of sectors. However, a definition that meets the criteria of a comprehensive representation of the forestry and timber industry - its direct, indirect and induced effects - does not yet exist. A corresponding formulation is therefore one of the first and most important steps in order to be able to calculate the economic effects as precisely and comprehensively as possible. It is important that such a definition includes all sub-areas of value creation for the forestry and timber industry, but at the same time allows comparisons with other industries in order to better map developments and to provide an indication of the relevance and size of the industry in relation to the overall economy as well as to other economic sectors. For a correct interpretation of the results, it is also necessary to know what any definition of the wood sector actually comprises.

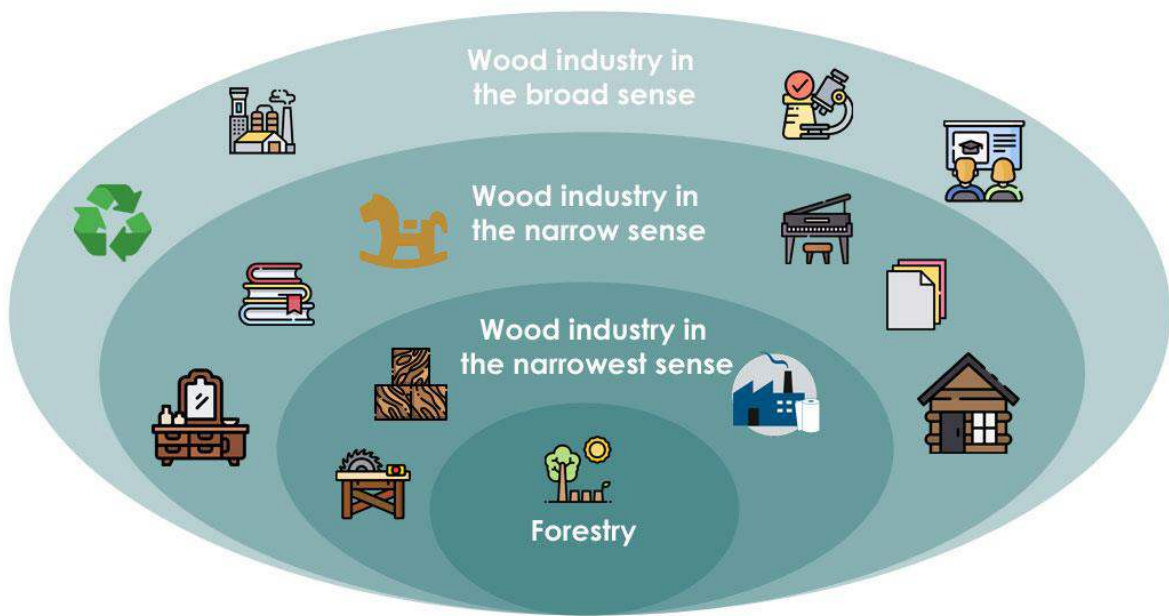
Therefore, this study is based on a definition in four stages. In the centre of this gradation, the production and further processing of the raw material wood to the intermediate and end products based on wood is to be represented. In the widest definition, the services related to training and research, distribution and storage, and remanufacturing of wood and wood products are also considered. Figure 7 gives an overview of the four-step, successive definition layers and the most important contents (products and services) of the respective delimitation.

- **Forestry:** all goods and services related to the provision of wood (planting, rearing, harvesting).
- **Wood industry in the narrowest sense:** Forestry plus all sectors that purchase inputs directly from forestry (sawmills, paper and paperboard, ...).
- **Wood industry in the narrow sense:** Wood industry in the narrowest sense plus all sectors receiving intermediate consumption from enterprises included in the narrowest definition (furniture, publishing, ...).
- **Wood industry in the broader sense:** Wood industry in the narrow sense plus all sectors that purchase inputs from companies in the narrow sense or are



thematically linked to timber industry (wholesale, retail, administration, research, recycling, ...).

Figure 7: 4-step definition of the forestry and wood industry



Source: Own figure.

To calculate the actual economic size of the forestry and wood industry for the E-30, the next step is to find a common and harmonized statistical classification that is in line with the official statistical classification system of the national accounting (CPA 2.1).

Excuse CPA 2.1

*“A statistical classification or nomenclature is an exhaustive and structured set of mutually exclusive and well-described categories, often presented in a hierarchy that is reflected by the numeric or alphabetical codes assigned to them, used to standardise concepts and compile statistical data.”<sup>4</sup>*

**Hierarchy:**

Letter	A	Products of agriculture, forestry and fishing
Two-digit Number	A02	Products of Forestry, logging and related services
Three-digit number	A02.1	Forest trees and nursery service
Four-digit number	A02.10	Forest trees and nursery service
Five-digit number	A02.10.1	Live forest tree plants; forest tree seeds
Six-digit number	A02.10.11	Live forest tree plants

For a detailed CPA 2.1 list see for example:

[https://www.statistik.at/KDBWeb/kdb\\_VersionAuswahl.do](https://www.statistik.at/KDBWeb/kdb_VersionAuswahl.do) or

[https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST\\_NOM\\_D\\_TL&StrNom=CPA\\_2\\_1&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC](https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_D_TL&StrNom=CPA_2_1&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC)

The actual mapping of the CPA 2.1 activities and services in the best possible detail was based on key word search within the classification description, patent search (which patents are related to wood and to which service or product can they be connected). Further, the mapping was discussed and agreed upon with international experts on wood and forestry. Therefore, two meetings were held and the list of included products and services was sent for review to all participating countries.

In the following chapter, each layer of the definition will be discussed shortly. Further, data sources for the calculation of the direct economic impact as well as for the calculation of the wood related shares will be described. If any prerequisites were taken, they too will be discussed shortly. The included CPA codes in the description are on the two-digit level, a detailed list of all included CPA categories in each layer (up to six-digit level) is included in the annex.

Generally, harmonized Eurostat data on production, GVA as well as employment was used whenever possible. If no data was available for 2019, the shares for 2018 were calculated and applied to the actual economic effects (production, GVA and employment in 2019). For the calculation of wood-related shares, Eurostat data was the preferred data source. If no data was available on Eurostat, secondary literature and data as well as expert interviews were relied upon. Whenever possible, the same data source was used for all countries to keep data comparable.

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<sup>4</sup> Eurostat, see <https://ec.europa.eu/eurostat/web/main/data/classifications>

### 3.1 Forestry

Forestry is the core of the wood industry and includes all goods and services related to the provision of wood starting with planting and rearing, but also including harvesting of trees.

Within the System of National Accounts, the sector A 02 is defined as products of forestry, logging and related services.

Forestry	
A 02	Products of forestry, logging and related services

Calculation of the relevant share for forestry is based on the statistic of outputs of forest products. The share of non-wood-based products within the sector A 02 was deducted from the total economic effects of this sector (and transferred to wood in the broader sense). Those non-wood-based products are for example wild growing edible products or parts of plants, mosses and grasses which are growing in forests.

### 3.2 Wood industry in the narrowest sense

The wood industry in the narrowest sense includes – in addition to the forestry –those sectors that purchase inputs directly from forestry (sawmills, paper and paperboard). Within the CPA classification these are C 16 and C 17.

Wood industry in the narrowest sense	
C 16	Wood and products of wood and cork, except furniture; articles of straw and plaiting material
C 17	Paper and paper products

Although more or less everything in this sector is based on wood, not everything is included. Since bamboo is strictly speaking a grass and not a tree, products based on bamboo within sector C 17 are excluded. The share of bamboo is based on the very detailed export statistic by products for each country. The underlying assumption is that the share of bamboo exports on all exports from this category equals the share of bamboo production in this category. Since the export statistic is the most detailed statistic on a product level, this is the best possible approach to estimate the actual share.

### 3.3 Wood industry in the narrow sense

The wood industry in the narrow sense includes in addition to the wood industry in the narrowest sense all sectors that are based on goods and services from the wood industry in the narrowest sense.

<b>Wood industry in the narrow sense</b>	
C 13	Textiles
C 18	Printing service
C 20	Chemicals and chemical products
C 30	Other transport equipment
C 31	Furniture
C 32	Other manufactured goods
E 38	Waste Collection, treatment and disposal service; materials recovery service
F 41	Buildings and building construction works
F 42	Constructions and construction works for civil engineering
F 43	Specialised construction works
J 58	Publishing service
M 71	Architectural and engineering service; technical testing and analysis services

Here, not the whole 2-digit sectors, but only shares of them are included in the wood satellite account. For textiles, the shares are based on secondary literature, since the wood share was not identifiable through any existing statistics, not even exports. However, patent research and secondary literature revealed that the share of wood-based fibres in textiles is significant. For printing, the total of CPA C 18.1 Printing services and services related to printing is included, while C 18.2 Reproduction service of record media was excluded. The wood share of sectors C 20 to C 32 are based on detailed export data. In every 2-digit sector, those products that are mainly made of wood (or celluloses) or would not exist in their current state without wood are included. For example, skies are included, since the core of the skis is wooden although the surrounding may not be fabricated out of wood. Without wood, the ski would lose a characteristic and necessary feature.

Most of the times wood waste is further used and companies working with products of forestry rework their wood waste or sell it directly. However, there are still some wood wastes that are disposed, collected, treated and recovered. The wood-share of sector E 38 is based on the detailed European waste statistics for each country (separated by type of waste).

Construction is split in three sectors:

- buildings,
- civil engineering (e.g., bridges) and
- specialised construction works (e.g., carpenters).

Wood plays an important role in construction, however it varies strongly across countries. To identify the wood share for buildings, secondary (peer reviewed) literature was used (the latest possible numbers for the shares for each country). Although some bridges and walls are made of wood, the wood share for civil engineering, is (currently) neglectably small and thus not accounted for. For specialized construction work, the economic impact of carpenters was used as an approximation.

Publishing excludes online publishing.

The wood share of architectural services orients itself on the wood share of building construction.

### **3.4 Wood industry in the broad sense**

This is the wood industry in the narrow sense plus sectors that purchase inputs from companies in the narrow sense or are thematically linked to the timber industry (wholesale, retail, administration, research, recycling, ...)

<b>Wood industry in a broad sense</b>	
A 01	Products of agriculture, hunting and related services
A 02	Products of forestry, logging and related services
C 23	Other non-metallic mineral products
C 28	Machinery and equipment n.e.c.
D 35	Electricity, gas, steam and air conditioning supply
G 46	Wholesale trade services, except of motor vehicles and motorcycles
G 47	Retail trade services, except of motor vehicles and motorcycles
H 49-52	Transport services, Warehousing and support services for transportation
K 65	Insurance, reinsurance and pension funding services, except compulsory social security
M 72	Scientific research and development services
N 82	Office administrative, office support and other business support services
O 84	Public administration and defence services; compulsory social security services
P 85	Education services
S 94	Services furnished by membership organisations

A 01 includes the share of agricultural production that is related to fruit growing on trees (olives, plums, apples, etc.). Further, hunting (which is commonly done in woods) is included. All parts of A 02 which were ignored in the more specific definitions so far are included here – these are wild growing non-wooden products like cork, wild growing edible products, etc.

Wood-based non-metallic mineral products include for example cellulose fibre-cements. The share is based on the detailed export statistics by product.

Section C 28, machinery, equipment not elsewhere classified includes machinery used for planting, rearing and harvesting, but also book binding machinery or machinery for paper and paperboard production. Here as well, the export share of wood relevant products is taken as an approximation.

The wood-related share of electricity is based on the electricity that is produced out of wood or wood-related products (like paper or wood waste). To calculate that share the European energy statistics of primary production by energy source was used.

Trade margins of wholesale and retail sale (G 46 and G 47) were approximated by using the national IOTs and the wood-relevant production value as well as GVA of products of the wood-relevant products.

For the transport margins (including warehousing and support service for transportation), the transported tonne-kilometres per type of transport and good was used as approximation of the split of wood-relevant transportation (road, rail, water).

With regards to insurance, secondary literature and information from the intermediate goods structure (based on national IOTs) was referred to. Both approaches suggested that the wood-based economic effects within the insurance sector are close to zero, thus they are not included in the current calculations of the wood satellite account.

To calculate the relevant parts of research, the share of scientific publications related to forestry in all scientific publications (per country) was used as approximation. This is a lower bound of the relevant share since it is not considering research without publication.<sup>5</sup> However, data on those parts were not available in a consistent way or sparse.

The wood-share of trade shows and conventions is based on the economic importance (measured in terms of contribution to the national GVA) of the forestry and wood industry in the narrowest sense. The same approach is used for the identification of the wood-relevant share of membership organisations (S 94).

The wood-relevant share of public administration was approximated by taking personnel costs assigned to the field of forestry and the environment as share of total personnel costs (local, regional and national public administration).

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<sup>5</sup> However, such research without publication can also exist in other research fields.

For education, the number of pupils (secondary education) and students (tertiary education) assigned to the field of forestry as share of all pupils and students was used as an approximation.

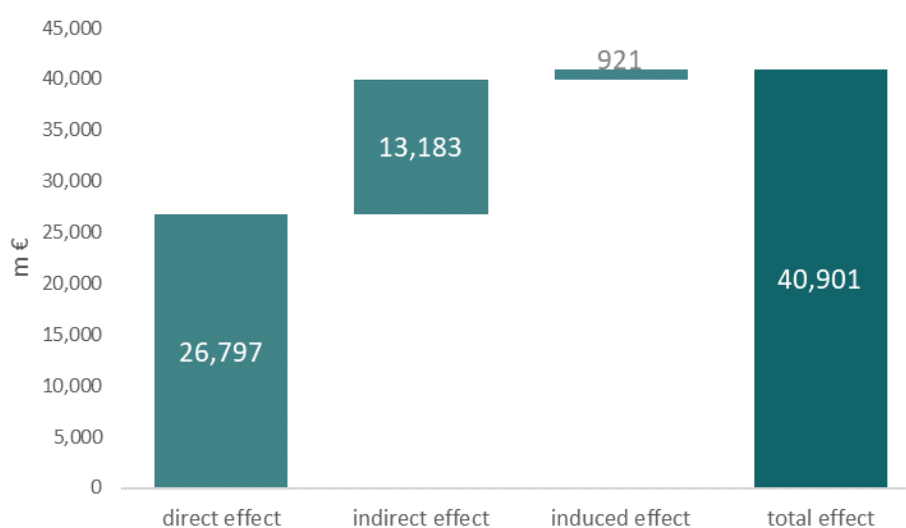
## 4 Economic Impact of Forestry

### 4.1 Gross Value Added

Forestry, the narrowest of the four definitions, generates a direct GVA of roughly 26.8 bn euros in the E-30. These are the effects only of the forestry companies without the upstream or downstream value chain.

The GVA-effects in the supply-network (indirect effects) come close to 13.2 bn euros as can be seen in Figure 8 and are again measured all over the Europe-30 (E-30). It is important to note here that all indirect effects are taken into account; i.e. even if Sweden imports intermediate inputs from e.g. Denmark, these indirect effects in Denmark are also counted as long as we do not show the national effect but the effect in the Europe-30. Only indirect effects that take effect outside the 30 countries are not taken into account.

Figure 8: Gross value added of forestry in the E-30, 2019



Source: Own calculations.

Whenever a person is directly or indirectly employed, they receive wages or salaries. Parts of these are consumed which is again a boost for the economy. These induced effects sum to 0.9 bn euros, making a total of 40.9 bn euros.

The ratio of total to direct effect is called the multiplier and can be interpreted as an indicator of how well the companies generating the direct effects are interlinked with the rest of the economy due to their purchases of intermediate goods. As noted in the chapter on methodology, there are limits to this interpretation. In the case of GVA-related forestry, the multiplier equals 1.53, meaning that for every euro of GVA generated directly in a forestry-

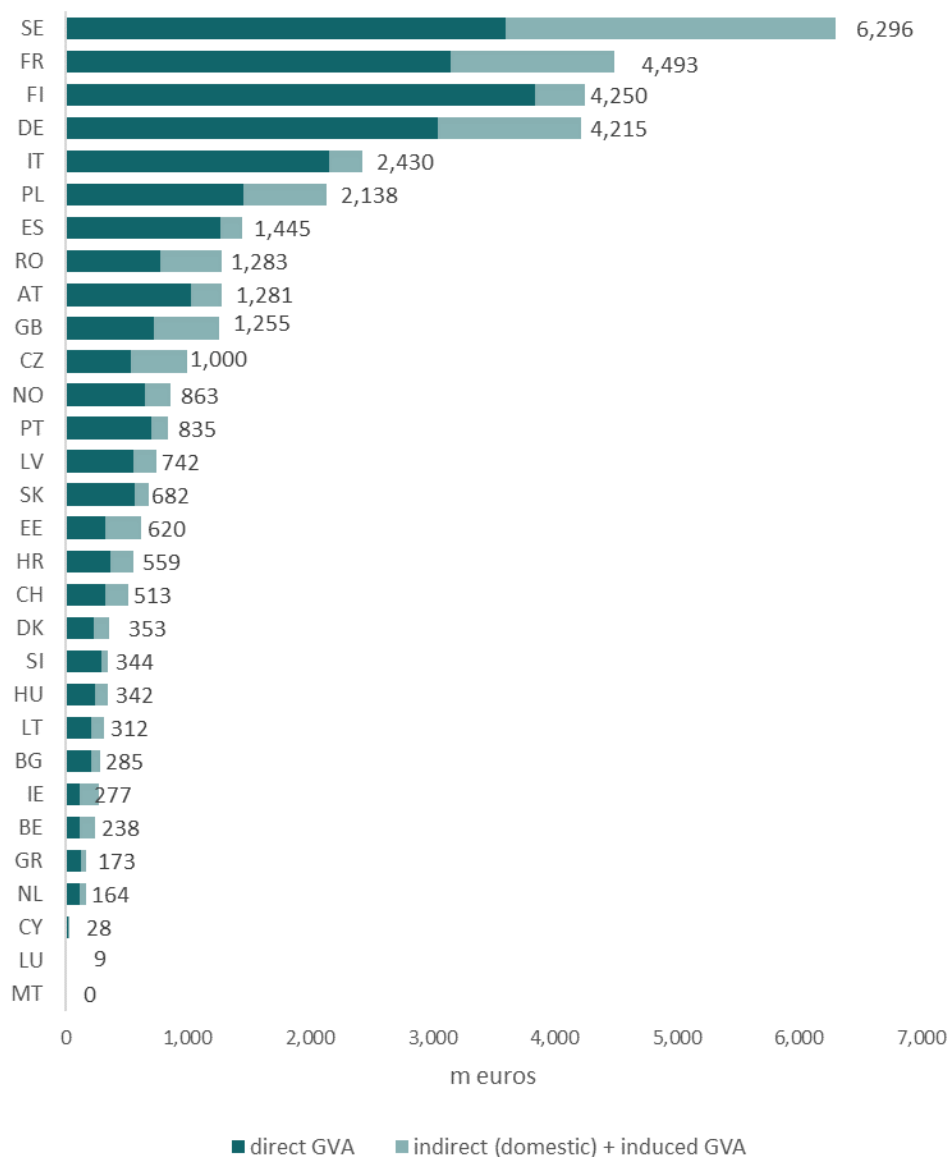


company, another 53 cents are generated in upstream and downstream value chain somewhere in the E-30.

The domestic values of GVA are given in Figure 9. The largest direct effects can be found in Finland, Sweden, France and Germany with more than 3 bn euros each, followed by Italy, Poland, Spain and Austria with more than 1 bn euros GVA each.

If indirect and induced effects are added, one gets the ranking and values shown in Figure 9 with Sweden dominating the picture due to its strong multiplicative effects.

Figure 9: GVA by countries (E-30), in m euros, 2019

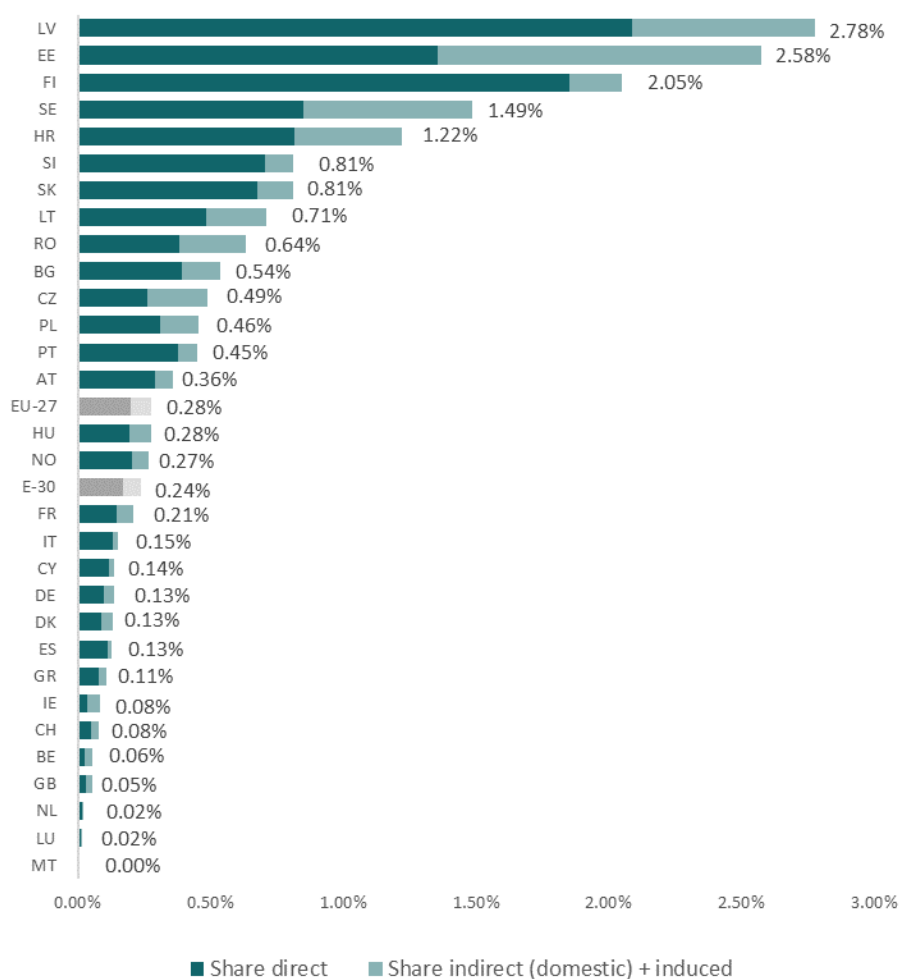


Source: Own calculations.

Note that, in contrast to above, only domestic indirect effects are counted here. That means that if a company from Sweden purchases intermediate goods from Denmark, the indirect effect on Denmark is not counted due to the focus on the single countries in this figure. Countries with more than 4 bn euros of total GVA are Sweden, France, Finland and Germany. Italy and Poland also report more than 2 bn euros.

Another interesting insight is given in Figure 10 which shows the importance of forestry in relation to domestic GVA.

Figure 10: Share of national gross value added of forestry, in %



Source: Own calculations.

Although Latvian forestry is rather small in absolute terms, it is very important for the country nevertheless and is the only country in the study where direct effects of forestry exceed 2 per cent of national GVA. In Estonia and Finland, forestry contributes more than 1 per cent

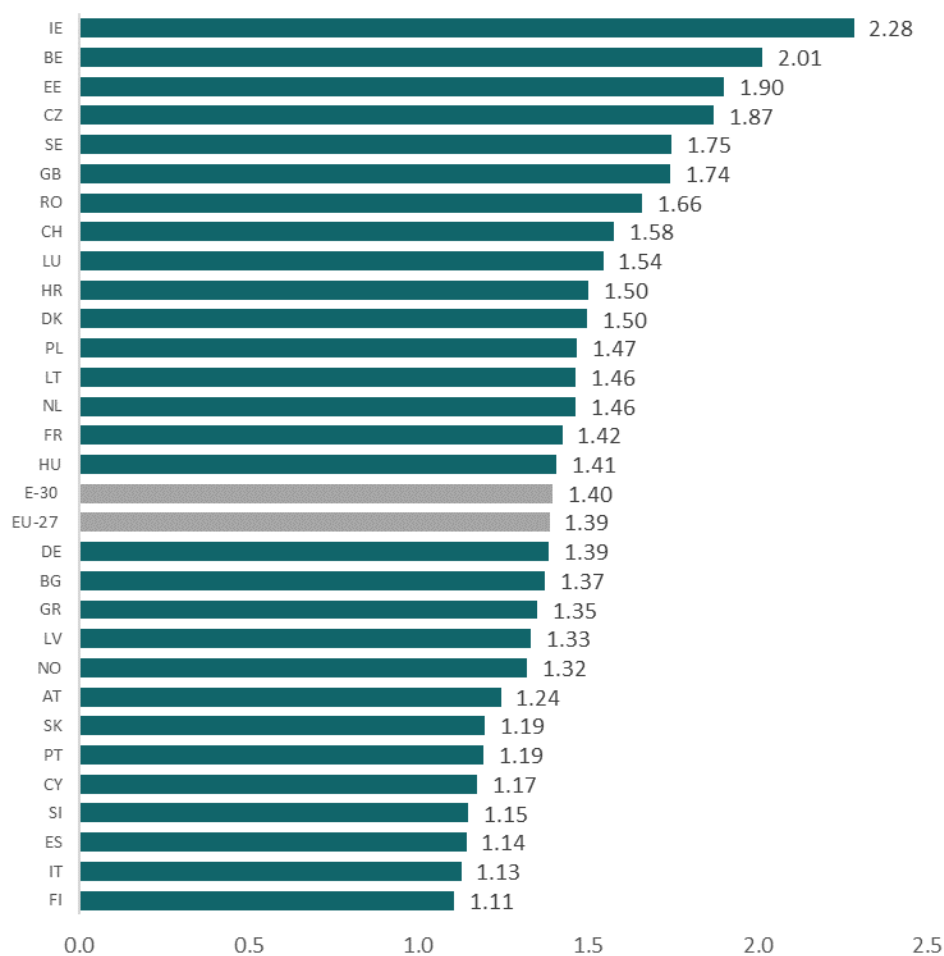
to national GVA, in Sweden and Croatia it is still above 0.8 per cent. On average, the share is 0.20 per cent in the EU-27 and 0.17 per cent in the E-30.

Adding the multiplier effects, the ranking changes somewhat. Latvia stays in the lead, followed by Estonia and Finland, each having more than 2 per cent of their national GVA generated by forestry and its multiplier effects. Sweden and Croatia report more than 1 per cent.

This figure demonstrates the different importance of forestry on the various national economies as the shares easily vary by a factor of 10 and more.

National GVA-multipliers are reported in Figure 11. Again, only the domestic GVA effects of each country were considered which leads to the fact that the numbers reported here for the E-30 wide multiplier (1.40) is smaller than the one shown above in Figure 8 when all indirect effects are taken into consideration (1.53).

One must keep in mind that the smallest multiplier under even remotely normal circumstances is 1.0. When doing so, it becomes obvious that multipliers of forestry vary a lot, taking on values from 1.11 to 2.28. This is an indication that forestry is very differently organised. While it purchases many domestic intermediate goods in Ireland, Belgium, Estonia and the Czech Republic, the opposite can be observed in Finland, Italy and Spain. There is no correlation between these multipliers and the shares of national GVA produced by forestry or national GVA. It is likely that multipliers thus represent company-based decisions more than they are influenced by economic factors.

Figure 11: Domestic GVA multipliers of forestry<sup>6</sup>

Source: Own calculation.

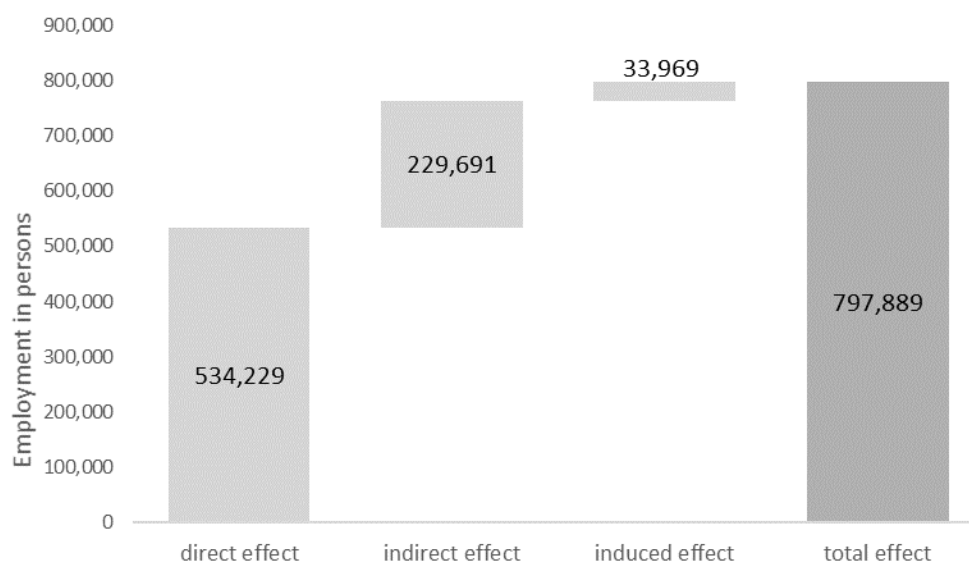
## 4.2 Employment

Forestry employs more than half a million persons (534,000) in the E-30 directly as can be seen in Figure 12. Another 230,000 find employment in the supply network, if national and international indirect effects are taken into account. When the 34,000 induced employees from consumption of wages and salaries are added, a total of 798,000 persons employed can be connected to forestry. This is roughly the size of a “standard” European capital city.<sup>7</sup>

<sup>6</sup> Since it has no forestry and calculating a multiplier therefore impossible, Malta is excluded here.

<sup>7</sup> Sources differ, but Copenhagen is reported to have around 644,000 inhabitants in 2022. See i.a. <https://www.statistikbanken.dk/BY1> or <https://www.statista.com/statistics/1303909/population-copenhagen/>

Figure 12: Employment of forestry, E-30, 2019

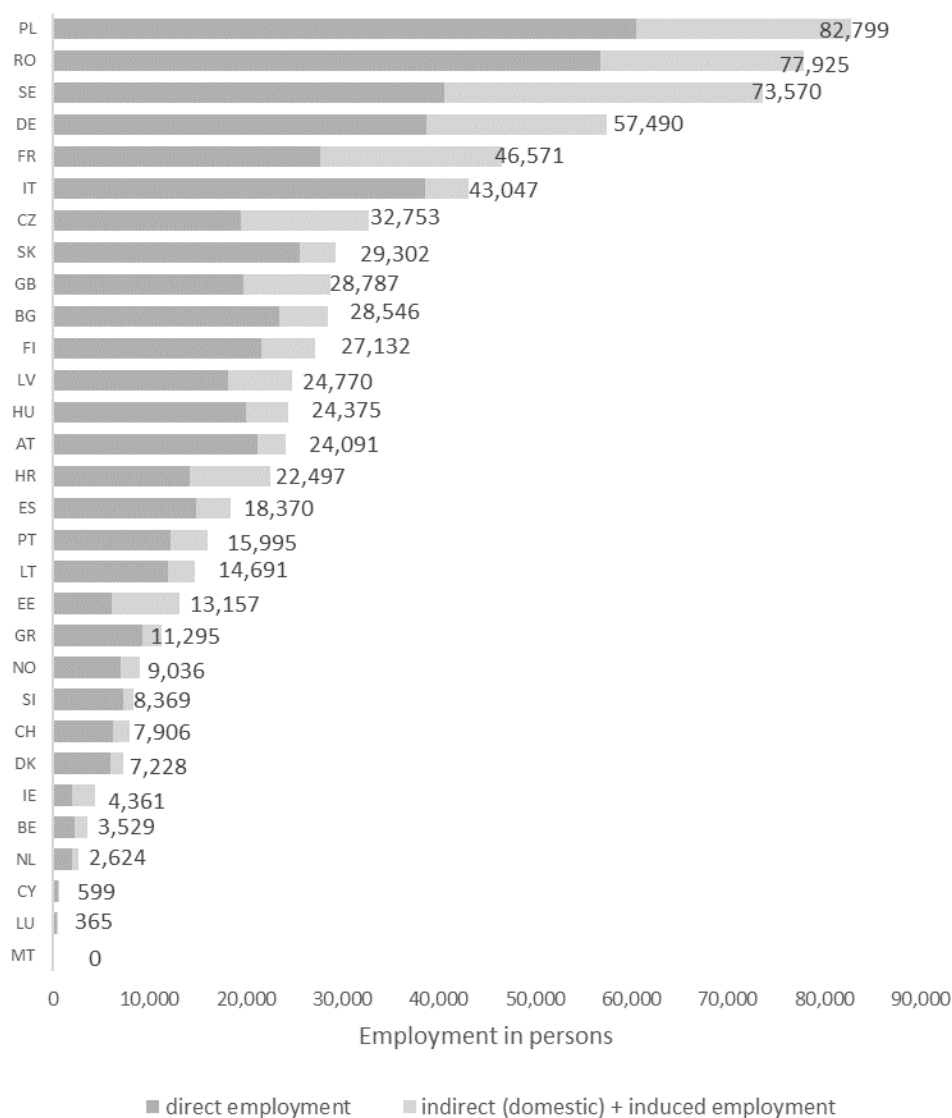


Source: Own calculation.

The largest employer in forestry is Poland with around 60,000 persons directly and 83,000 persons totally employed. Romania follows closely (57,000 and 78,000), Sweden is ranked third. As is the case for GVA, the ranking of total effects (shown in Figure 9) and direct effects differ substantially, hinting at strongly varying multipliers. Malta reports no GVA and consequently also employment for forestry.

As always, when national values are in the focus, only domestic indirect effects are reported. Intermediate goods purchased from another country are thus ignored here, in contrast to the E-30 wide numbers in Figure 13.

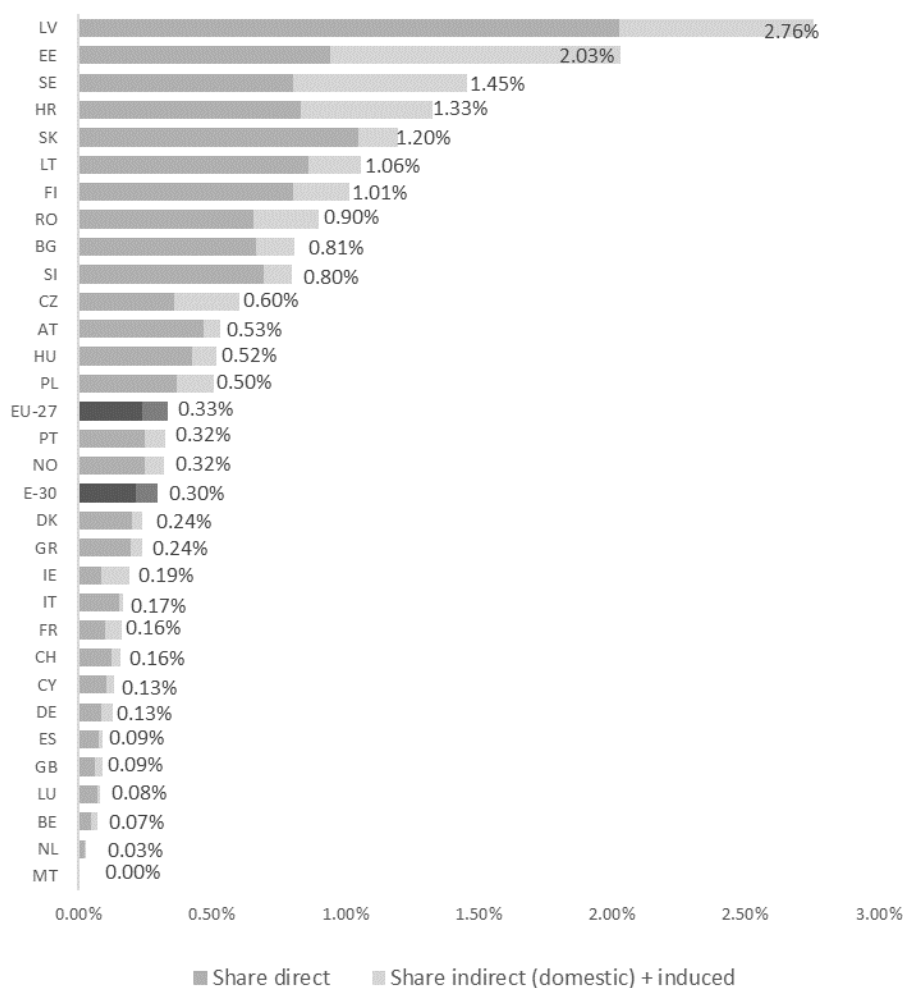
Figure 13: Domestic employment of forestry, 2019



Source: Own calculation.

Very important for the national interpretations are the shares of forestry-related employment in national employment which are depicted in Figure 14. They, as well as their GVA-counterparts, vary by more than a factor of ten. Latvia reports the highest values with 2.03 per cent direct and 2.76 per cent total share – nearly identical to the GVA-shares.

Figure 14: Shares of employment of forestry, in %

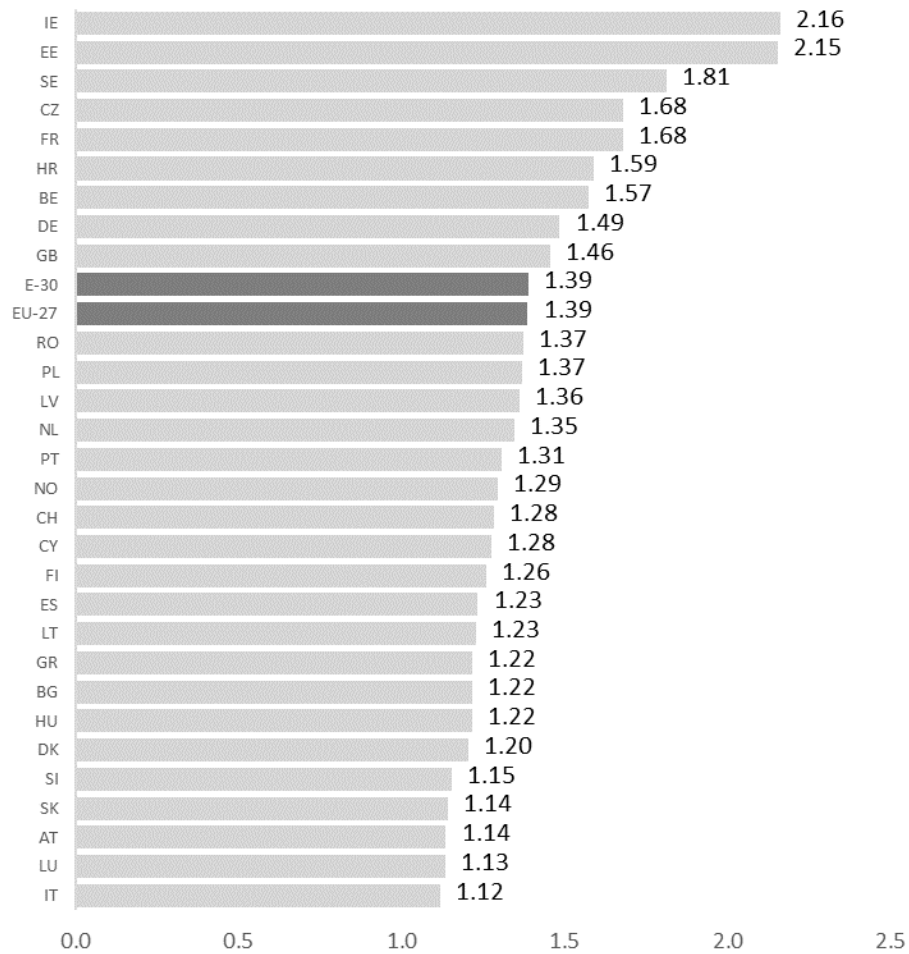


Source: Own calculation.

EU-27 shows 0.33 per cent, E-30 0.30 per cent which is above the GVA-values of 0.28 per cent and 0.24 per cent. This means that forestry is an employment intensive industry, producing more employment than GVA on average within the analysed regions. Forestry can thus be used to fight unemployment efficiently.

Multipliers of forestry are reported in Figure 15. Although strongly varying, as indicated by the differing rankings of the absolute employment numbers, they are slightly more compact than their GVA-counterparts. However, with values from 1.12 to 2.16, they still cover an enormous interval of possible values.

Figure 15: Domestic employment multipliers of forestry



Source: Own calculation.

For the EU-27 as well as the E-30, a value of 1.39 was calculated which is practically identical to GVA (1.39 and 1.40). That tells us that for every employee who is directly working for forestry company, another 0.39 employees can be found in the domestic supply network.

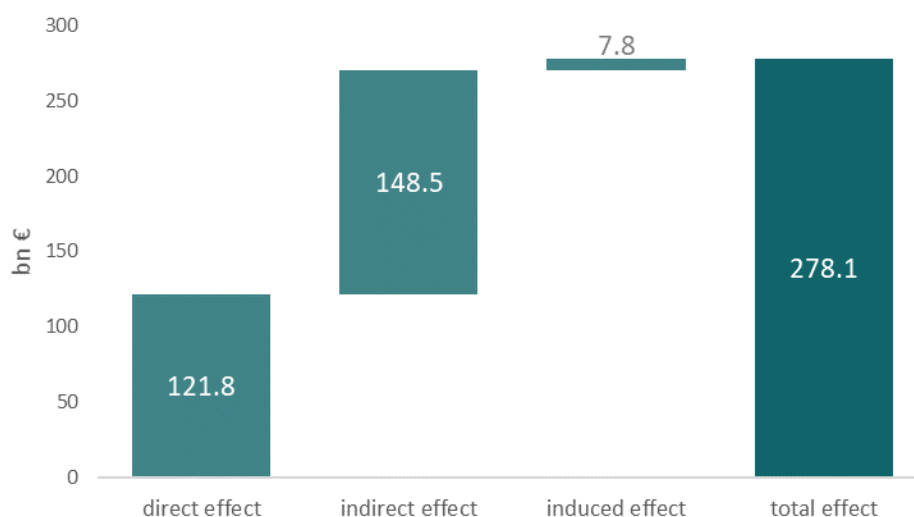


## 5 Economic Impact of Forestry and Wood in the narrowest sense

### 5.1 Gross value added

As can be seen in Figure 16, the narrowest definition of wood is already four to five times the size of forestry when direct GVA effects are considered (26.8 bn euros, see Figure 8). Even more striking is the indirect effect here, which is larger than the direct effect. If the induced effects are considered as well, a total amount of more than 278 bn euros can be reported. Dividing the total by the direct effects yields a GVA-multiplier of 2.28, greatly exceeding that of forestry (1.53). It can thus be said that the economic activities which expand the forestry definition to that of wood in narrowest sense are very well linked to the rest of the economy.

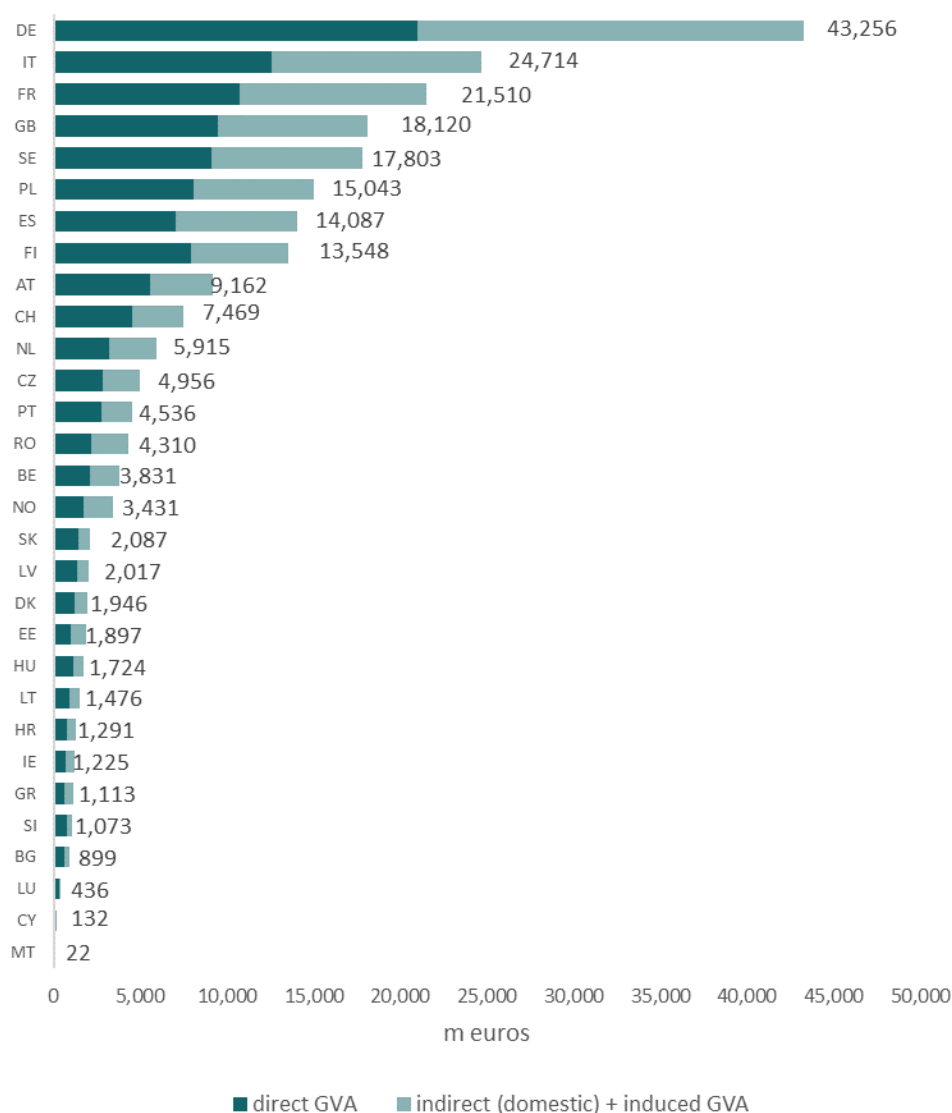
Figure 16: GVA of forestry and wood in the narrowest sense, E-30, 2019



Source: Own calculations.

The country-specific direct and total absolute amounts of GVA of wood in the narrowest sense are given in Figure 17. Germany shows the largest value by far with around 43.2 bn euros, followed by Italy with 24.7 bn euros and France with 21.5 bn euros. The United Kingdom, Sweden, Poland, Spain and Finland each report values of more than 10 bn euros as well. In contrast to forestry, the ranking shown here does not change a lot between direct and total effects, indicating a rather similar supply-structure compared to forestry.

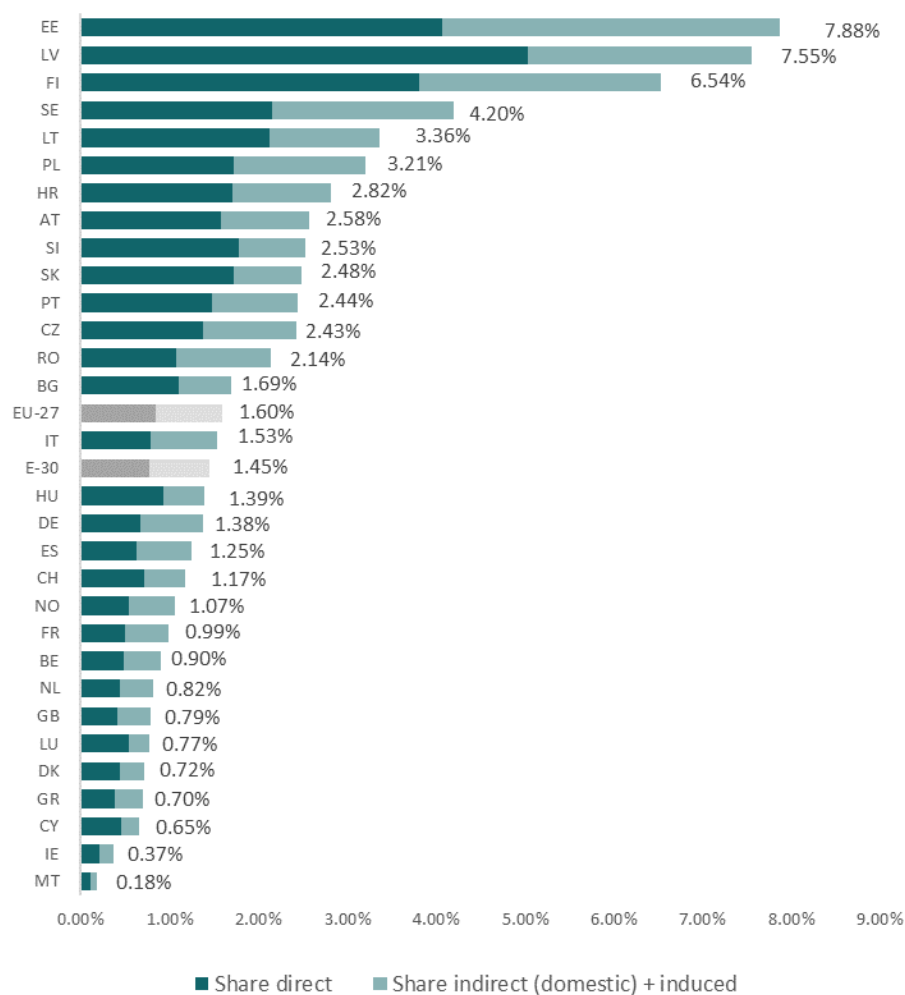
Figure 17: Domestic GVA of forestry and wood in the narrowest sense, 2019



Source: Own calculations.

Again, it is interesting to see the share of wood in the narrowest sense in relation to the whole national economy. Values in Figure 18 show that these shares may exceed 6 per cent in the case of Estonia, Latvia and Finland when total effects are considered. Sweden, Lithuania and Poland reach values above 3 per cent. There seems to be a strong geographical focus on the northeast of Europe with the Baltic states plus Finland, Sweden and Poland forming the top-6. The average of the EU-27 is at 1.60 per cent, the E-30 are at 1.45 per cent.

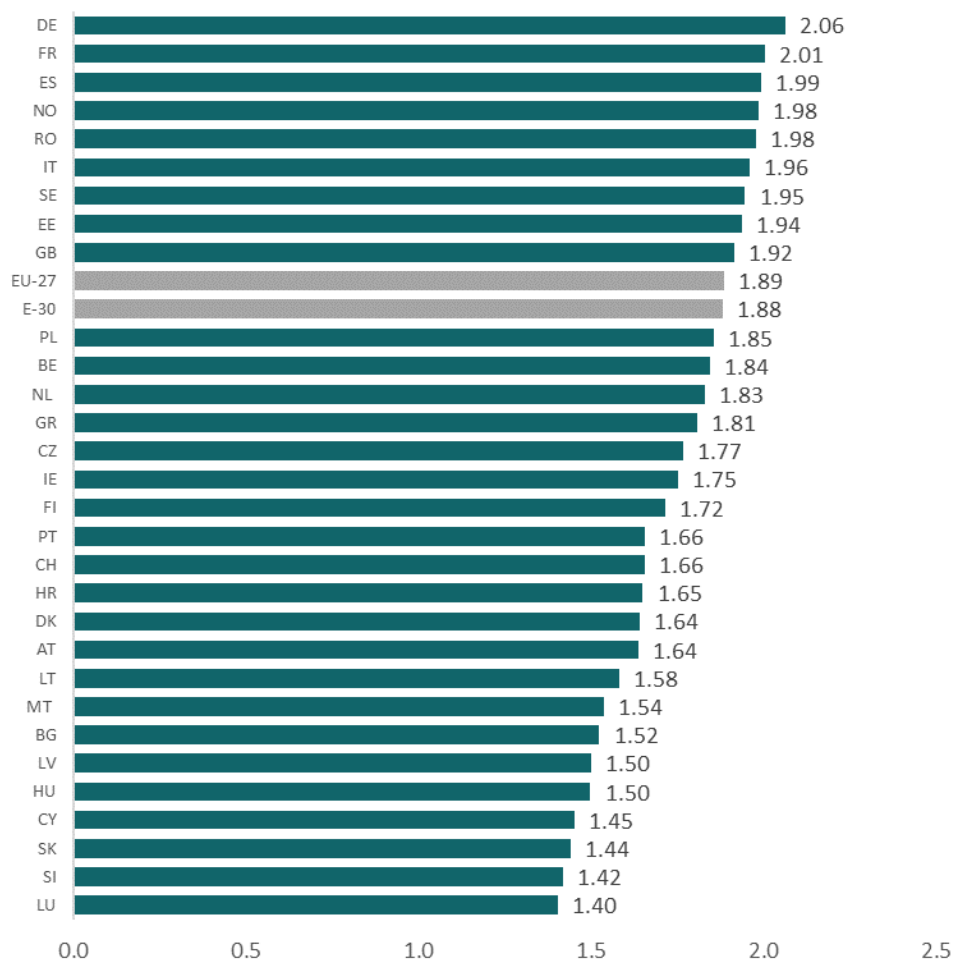
Figure 18: Shares of GVA of forestry and wood in the narrowest sense, 2019



Source: Own calculations.

GVA-multipliers of wood in the narrowest sense are given in Figure 19. They are closer together than in forestry: While before they varied widely (1.11 to 2.28), they are now more compressed in the range between 1.40 to 2.06 again supporting the interpretation that the supply-networks of wood in the narrowest sense are more homogeneous than that of forestry. The average multipliers are also much higher now at 1.89 and 1.88 than for forestry (1.39 and 1.40), indicating that wood in the narrowest sense is better connected to the domestic supply networks and needs more intermediate goods than forestry.

Figure 19: Domestic GVA multipliers of forestry and wood in the narrowest sense



Source: Own calculations.

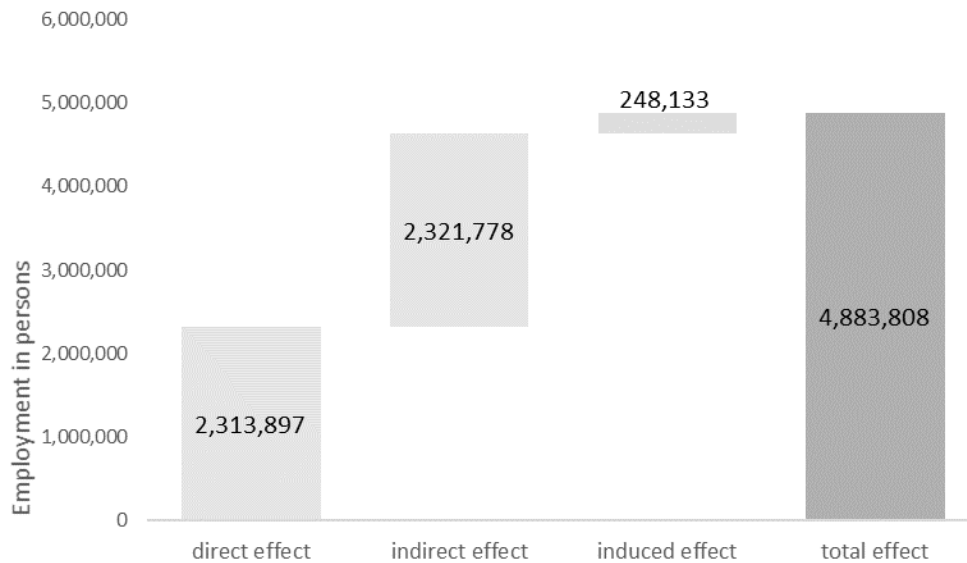
## 5.2 Employment

Moving from forestry to the narrowest definition of the wood-industry, a direct employment effect of 2.3 m persons within the E-30 can be reported. If the administrative borders of Paris are used, a population of around 2.2 m persons is reported for the city in 2020.<sup>8</sup> Another 2.3 m persons are employed in the supply network of the E-30 and further 248,000 persons find employment due to the consumption effect. In total, close to 4.9 m persons are employed in the E-30 directly or in some way connected to the wood-industry in the narrowest sense. This is between the size of Croatia (3.87 m inhabitants) and Norway (5.39 m inhabitants).<sup>9</sup>

<sup>8</sup> See <https://www.insee.fr/fr/statistiques/6676182?geo=COM-75056>

<sup>9</sup> See Eurostat indicator CENS\_21AG or

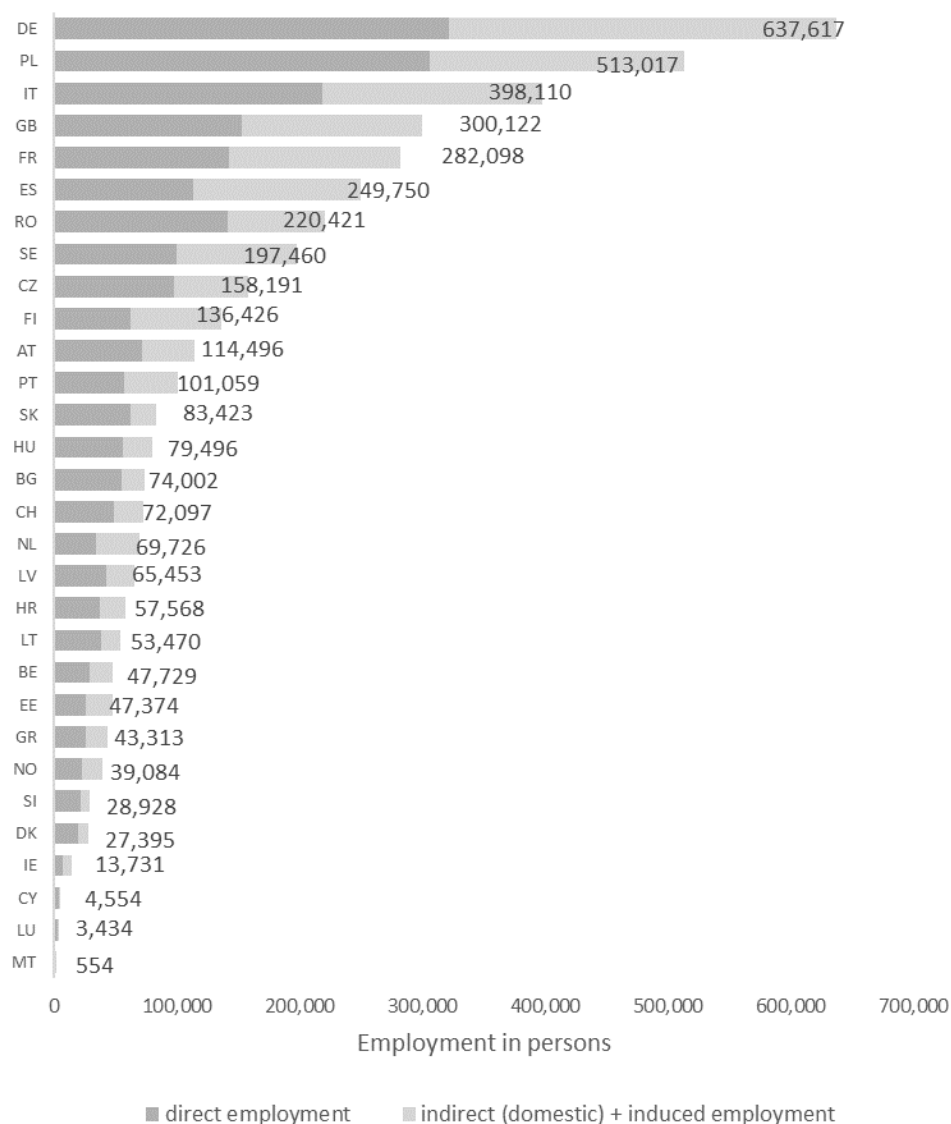
Figure 20: Employment of forestry and wood in the narrowest sense, 2019



Source: Own calculations.

Germany employs most persons in this definition, reporting close to 322,000 directly and 638,000 total employees. Poland and Italy follow. As can be seen in Figure 21, rankings by direct and total employment correlate rather well, again indicating multipliers ranging within a smaller interval as for forestry.

Figure 21: Domestic employment of forestry and wood in the narrowest sense, 2019



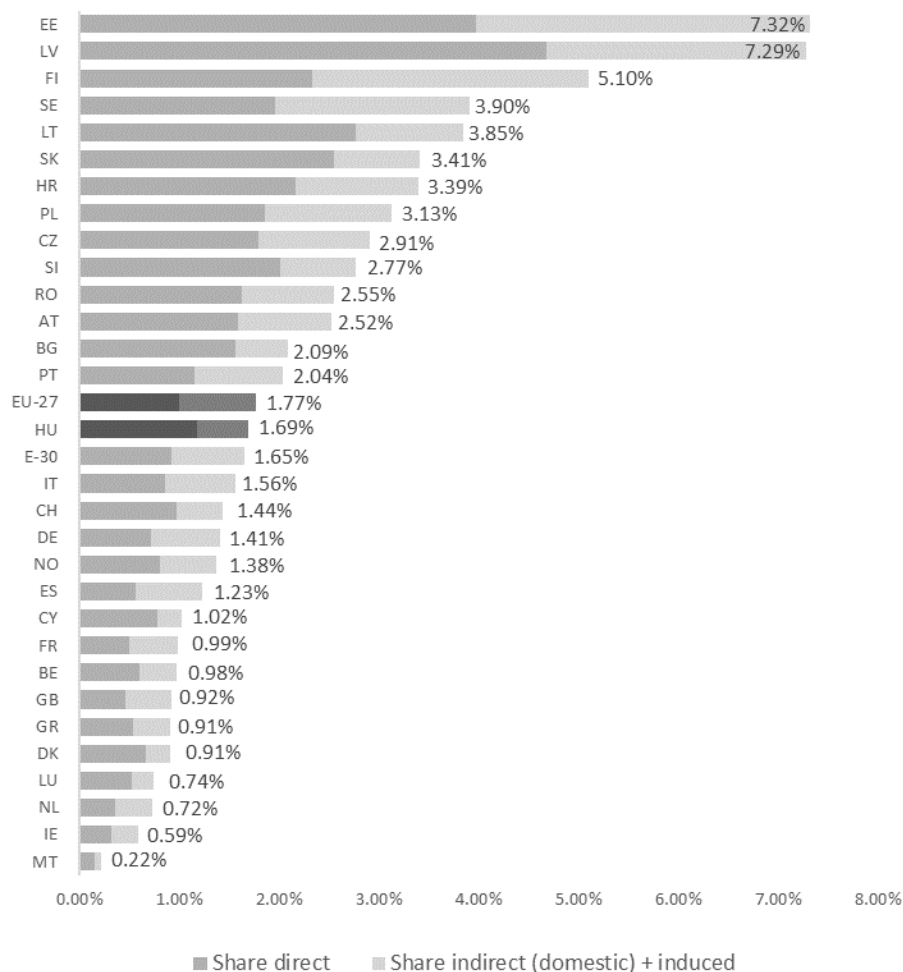
Source: Own calculations.

When switching from absolute numbers to shares, the national importance of wood in the narrowest sense becomes visible in Figure 22. Estonia and Latvia are ahead by far with around 7.3 per cent of total employment, followed by Finland with 5.10 per cent and then Sweden and Lithuania reporting around 3.9 per cent. Shares differ much less than for forestry, indicating that although forestry is focussed on a couple of countries, processing wood is more common.

The EU-27 report a share of 1.77 per cent, the E-30 a share of 1.65 per cent which is more than the GVA-related shares (1.60 per cent and 1.45 per cent). Thus, as was the case for

forestry, wood in the narrowest sense is employment intensive, generating relatively more employment than GVA.

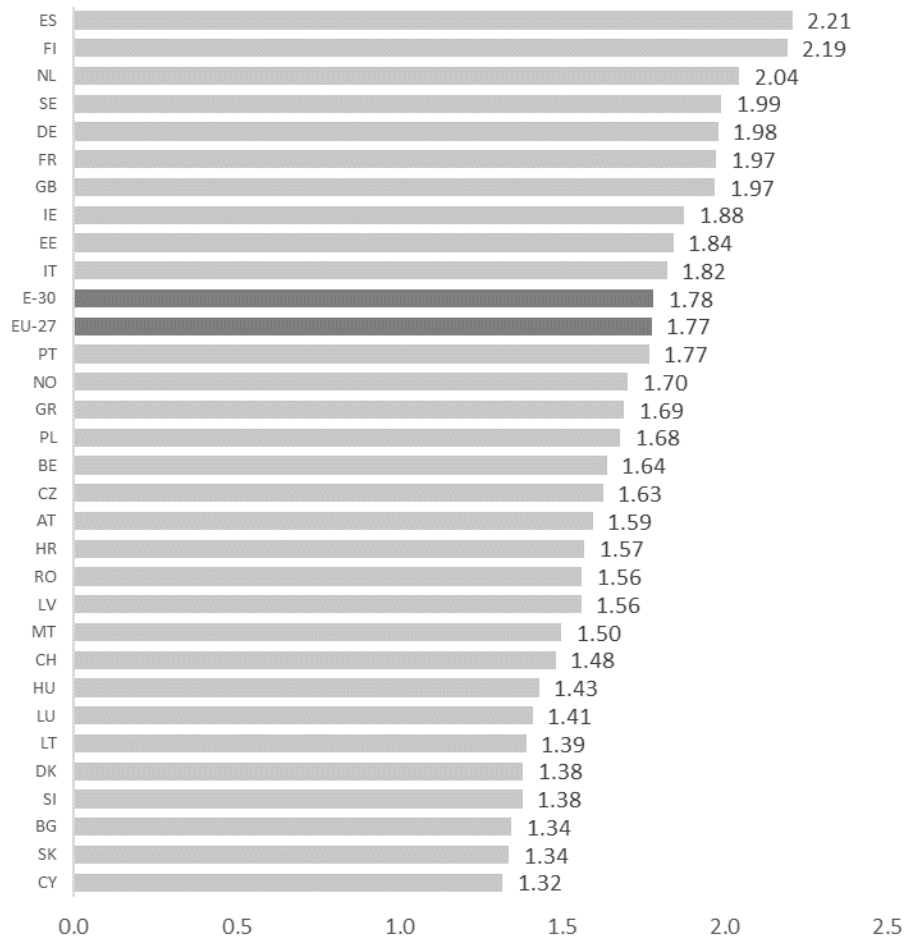
Figure 22: Shares of employment of forestry and wood in the narrowest sense, in %



Source: Own calculations.

As was expected, multipliers are a little more “compact” than in forestry. Figure 23 shows values ranging from 1.32 to 2.21. It is interesting to note that the E-30 and EU-27 values here are nearly 0.4 percentage points higher (1.78 and 1.77) than the values in forestry (1.39 in both cases). Wood in the narrowest sense thus is clearly better connected to the rest of the economy than forestry. However, they are smaller than their GVA-counterparts (1.88 and 1.89) which means that the supply network of wood in the narrowest sense generates more additional GVA than employment. Still, the strong employment effect dominates overall.

Figure 23: Domestic employment multipliers of forestry and wood in the narrowest sense



Source: Own calculations.

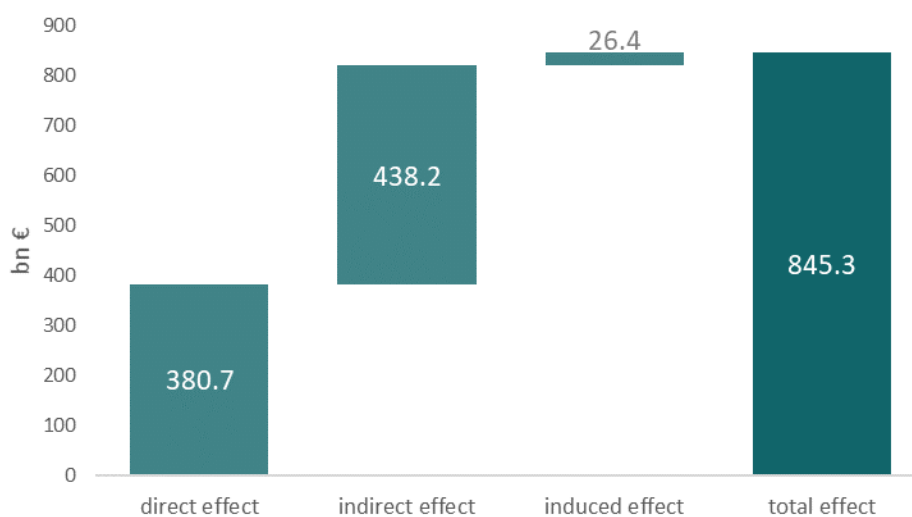


## 6 Economic Impact of Forestry and Wood in the narrow sense

### 6.1 Gross value added

Moving from the narrowest to the narrow definition, direct GVA effects increase again more than threefold to just below 381 bn euros (Figure 24). Indirect effects of more than 438 bn euros are strong again and adding the induced effects of 26 bn euros, a total effect of 845 bn euros is achieved. This results in a multiplier of 2.22 which is nearly as high as for the narrowest definition (2.28) and shows that for every euro of GVA in the direct effects, another 1.12 euros of indirect and induced effects are generated.

Figure 24: GVA of forestry and wood in the narrow sense, E-30, 2019

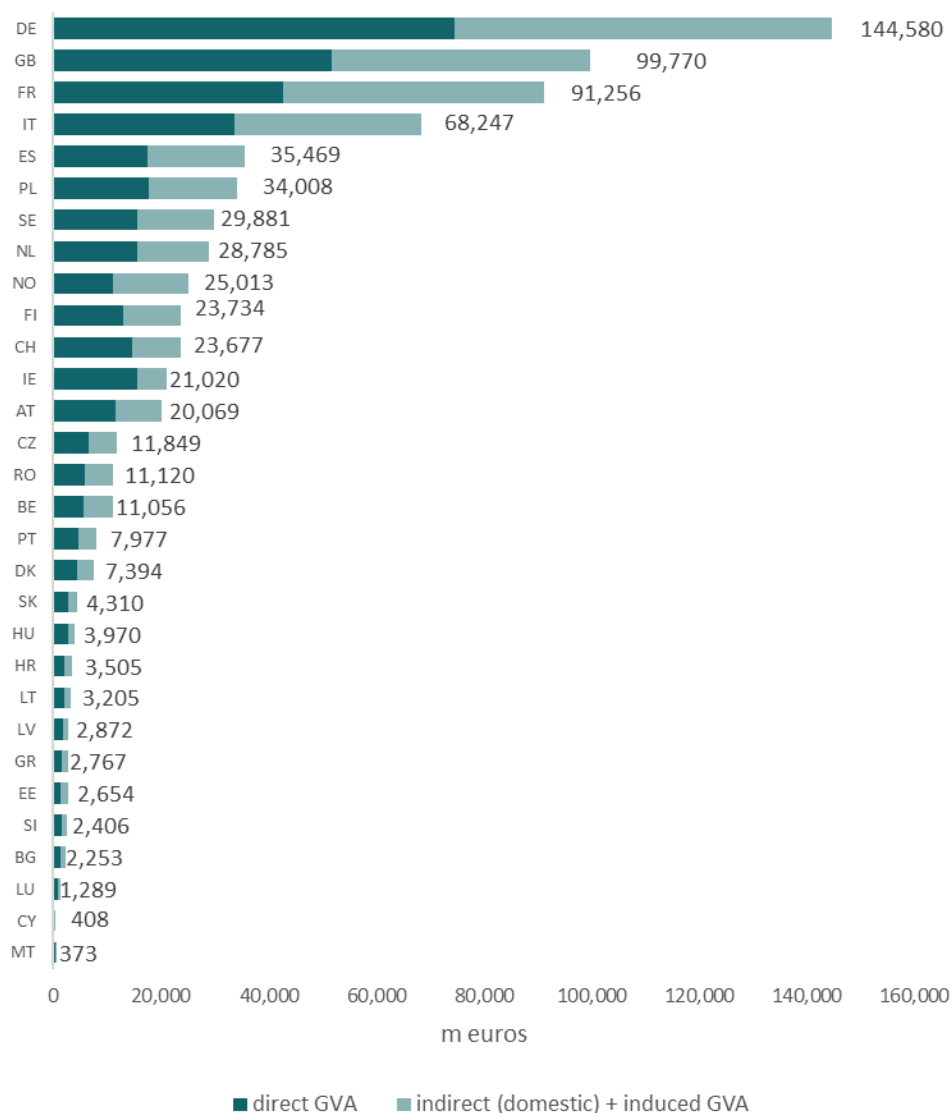


Source: Own calculations.

Absolute GVA on the country level is shown in Figure 25. Germany is in the lead with more than 144 bn euros of total GVA, followed by the United Kingdom, France and Italy who report values between 50 bn euros und 100 bn euros. The relation between direct und total

effects seems a little less smooth than for wood in the narrowest sense, hinting at a more differentiated supply-structure.

Figure 25: Domestic GVA of forestry and wood in the narrow sense

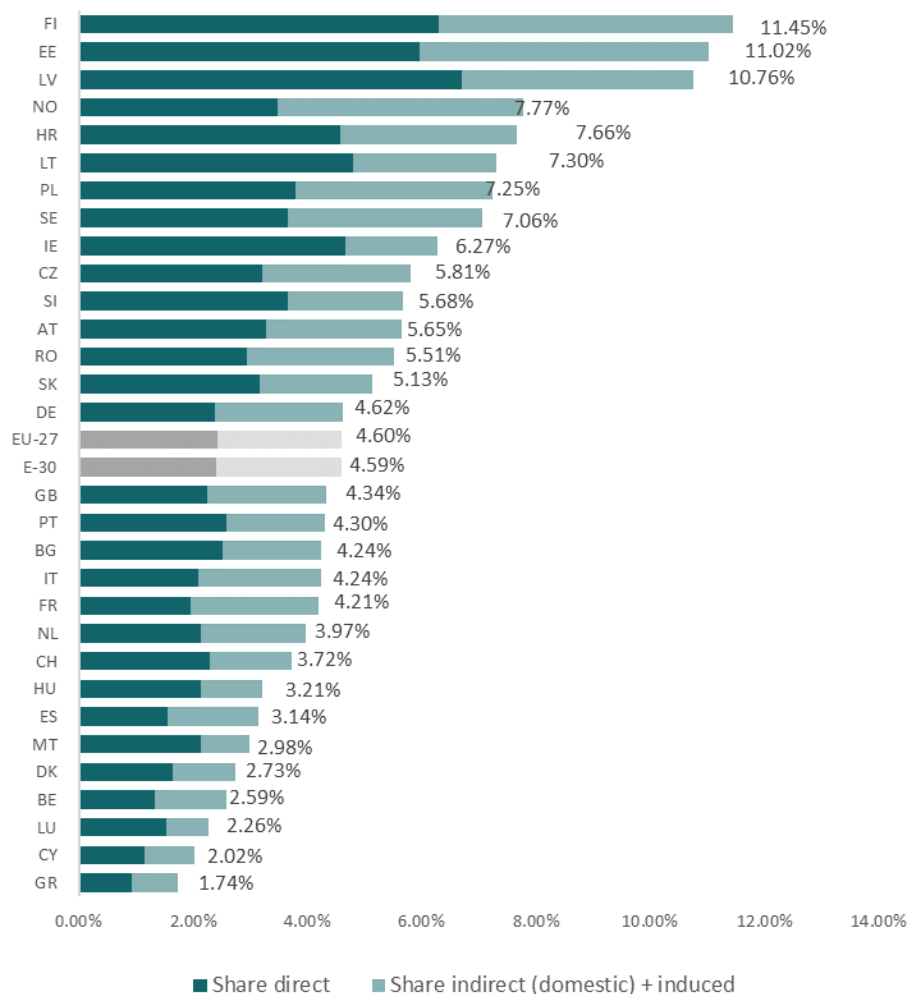


Source: Own calculations.

Switching from absolute to relative terms, Figure 26 reports the shares of wood in the narrow definition to total GVA. Finland, Estonia and Latvia reach values above 10 per cent if total values are taken into account which indicates the strong influence this industry has on these countries. It's worth noting that Norway is at rank 4, while it is ranked 20<sup>th</sup> in the narrowest definition. The reason is the strong construction sector combined with other related sectors like architecture. Differences between the countries are less pronounced than for forestry or the narrowest definition and in all countries of substantial size. In the EU-27, wood in its

narrow definition is responsible for 4.60 per cent of GVA and in the E-30 for 4.59 per cent. Even if only the direct results are considered, shares are at 2.42 per cent and 2.41 per cent.

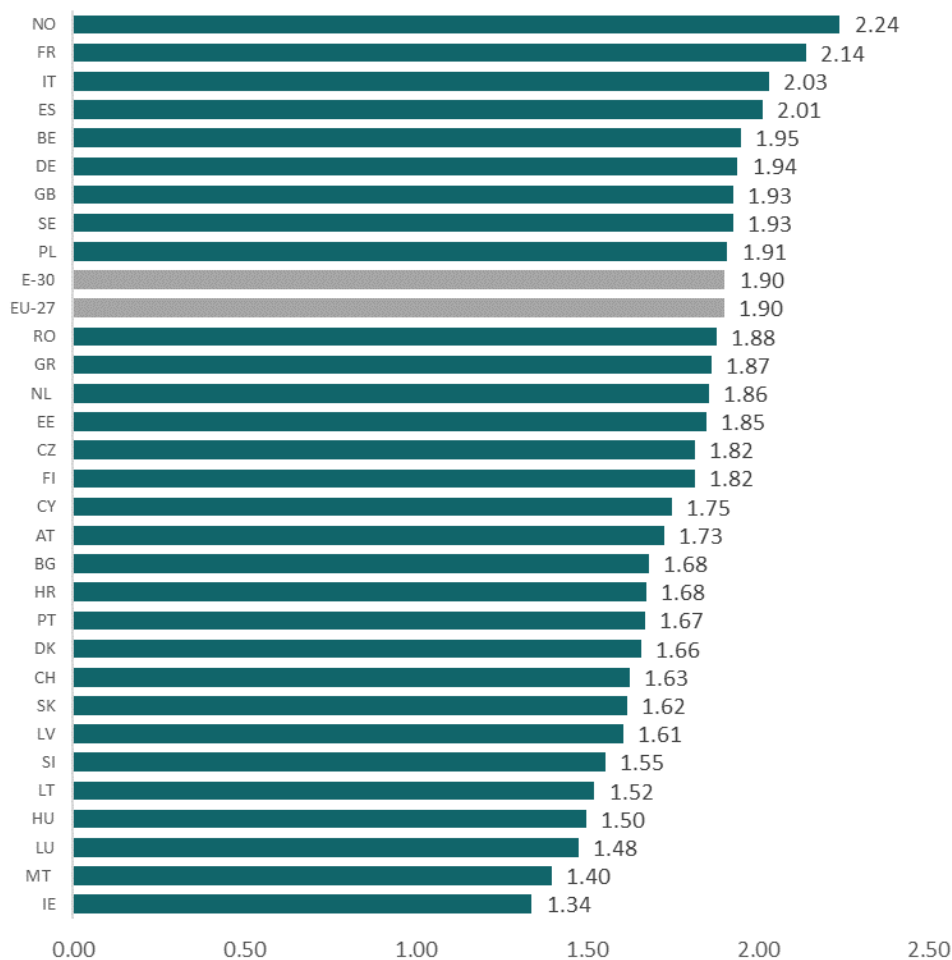
Figure 26: Shares of GVA of forestry and wood in the narrow sense, in %



Source: Own calculations.

Multipliers for wood in the narrow definition are shown in Figure 27. On average, they are nearly identical to those of the narrowest sense and take on the value of 1.90 for the EU-27 as well as for the E-30. However, the single values vary wider – from 1.34 to 2.24 –, as was already hinted at by the differences of direct and total absolute values and shares. Wood in the narrow definition thus is well linked to the rest of the economy in almost all countries analysed here. Even in those with smaller multipliers, they can still be considered to be average.

Figure 27: Domestic GVA multipliers of forestry and wood in the narrow sense



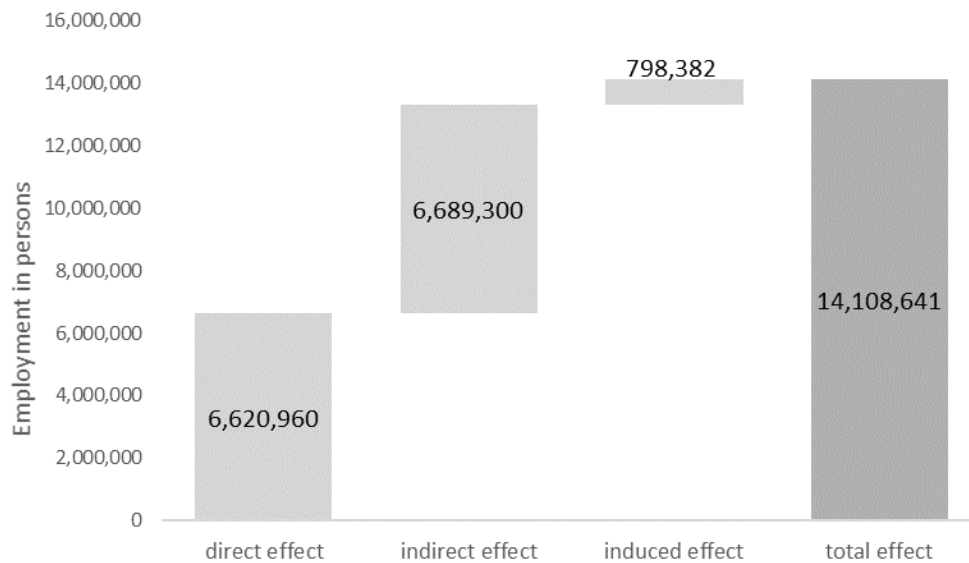
Source: Own calculations.

## 6.2 Employment

Moving from the narrowest to the narrow sense, direct employment roughly doubles to 6.6 m persons as can be seen in Figure 28. This is a little above the population of Bulgaria (6.5 m persons in 2021).<sup>10</sup> Another 6.7 m employees are working in the supply network and close to 800,000 can be assigned to the induced effects from consumption. That sums to a total of 14.1 m persons or nearly the populations of Portugal (10.3 m persons) plus Croatia (3.9 m persons).<sup>10</sup>

<sup>10</sup> See Eurostat indicator CENS\_21AG or [https://ec.europa.eu/eurostat/databrowser/view/CENS\\_21AG/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/CENS_21AG/default/table?lang=en)

Figure 28: Employment of forestry and wood in the narrow sense, E-30, 2019

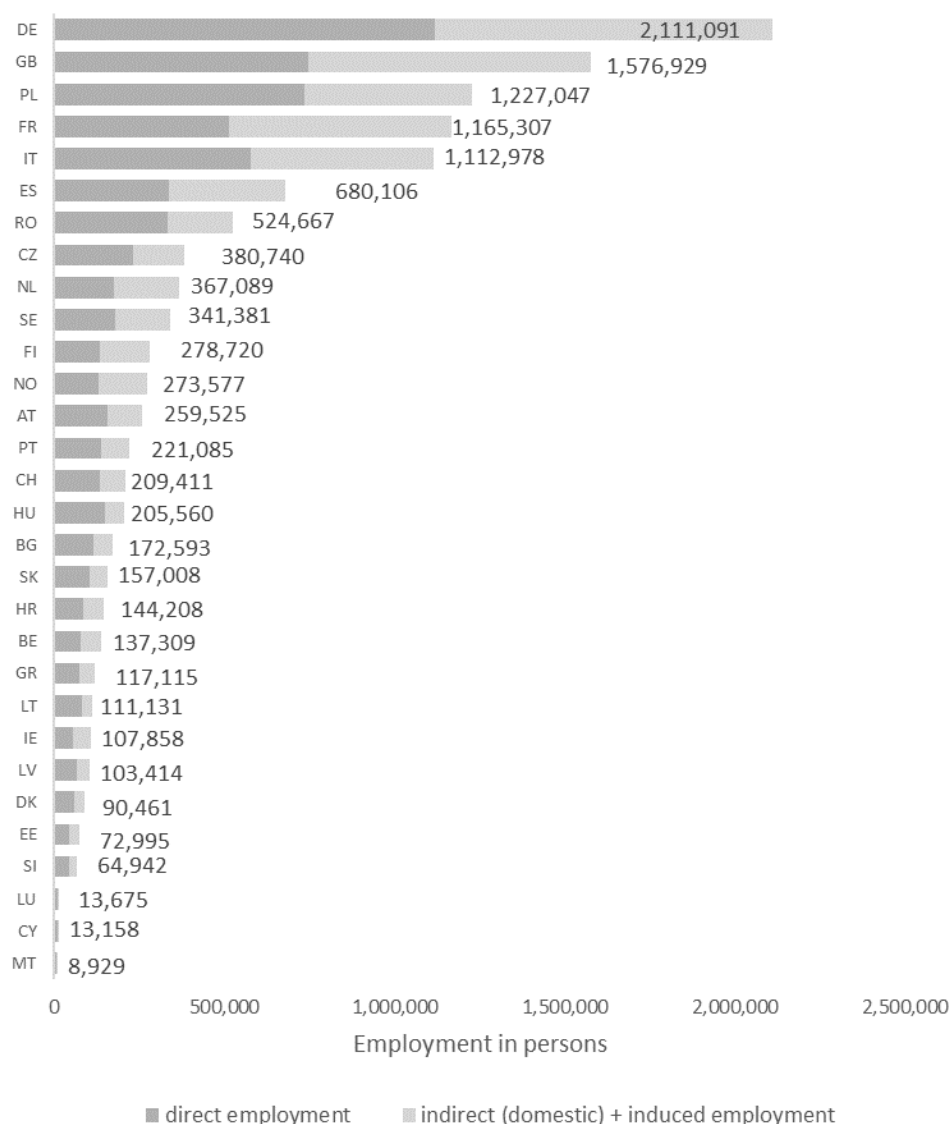


Source: Own calculations.

The multiplier equals 2.13 which means that for every person working directly in forestry or the wood industry in the narrow definition, another 1.13 person are employed either indirectly or due to consumption effects. This is a high value and nearly identical to the corresponding GVA-multiplier (2.12).

The country-based effects are shown in Figure 29, where Germany is in the lead with more than 1.1 m direct and more than 2.1 m total employees. The United Kingdom, Poland, France and Italy follow with more than 1 m total and between 500,000 and 750,000 direct employees each. It can be noted that Germany's lead is less pronounced than in the case of GVA (see Figure 25) where Germany's GVA was nearly 50 per cent than that of the United Kingdom on rank 2. This shows that Germany produces relatively more GVA and less employment within this definition.

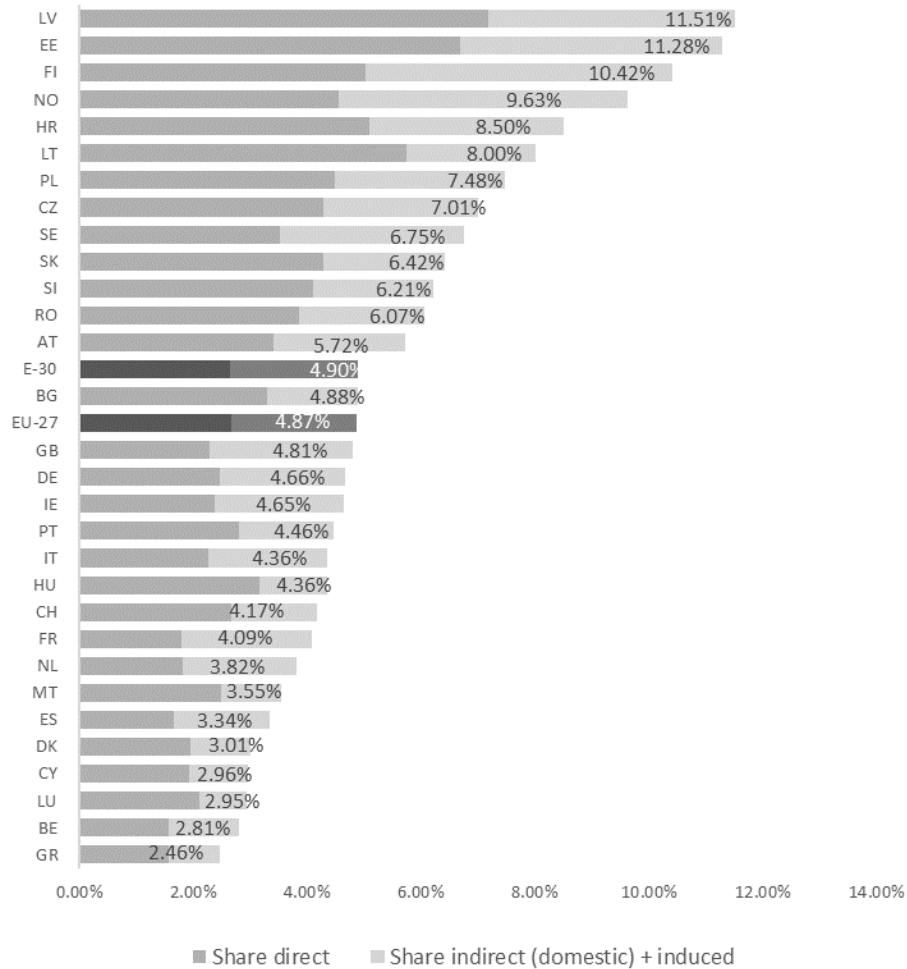
Figure 29: Domestic employment of forestry and wood in the narrow sense, 2019



Source: Own calculations.

For country-based analyses, shares – given in Figure 30 – are often more useful than absolute values. One can see that in Latvia, Estonia and Finland, total employment of the narrow definition surpasses 10 per cent. Norway, Croatia, Lithuania, Poland and the Czech Republic also report shares above 7 per cent. On average, we find 4.90 per cent in the E-30 and 4.87 per cent in the EU-27, compared to 4.60 per cent and 4.59 per cent for GVA. Forestry and wood in the narrow definition are therefore also employment intensive, generating higher shares of employment than GVA. Even in those countries where shares are lowest, direct effects of no less than 1.5 per cent and total effects between 2 per cent and 3 per cent can be observed.

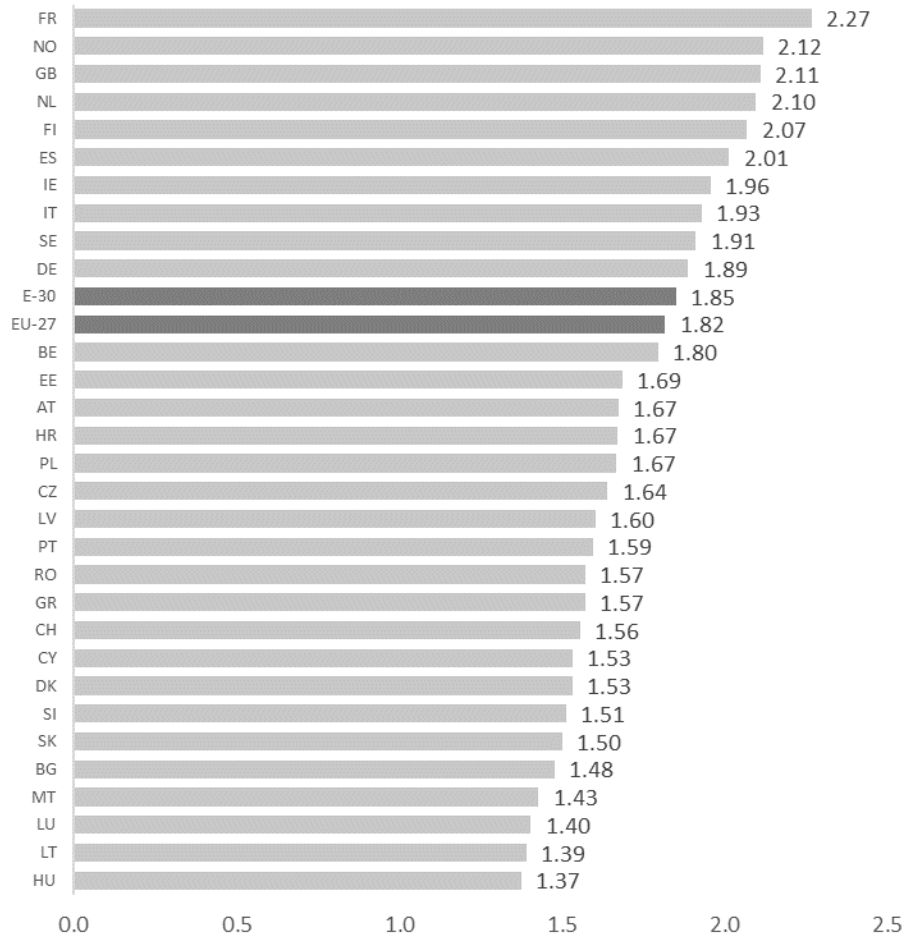
Figure 30: Shares of employment of forestry and wood in the narrow sense, in %



Source: Own calculations.

Employment multipliers are given in Figure 31. Values range between 1.37 and 2.27. Although this interval is similar to that of GVA, the average multipliers of employment are slightly lower with 1.85 (E-30) and 1.85 (EU-27). For every employee in the E-30, another 0.85 employees within the same country can be found which is caused by forestry and wood in the narrow sense.

Figure 31: Domestic employment multipliers of forestry and wood in the narrow sense



Source: Own calculations.

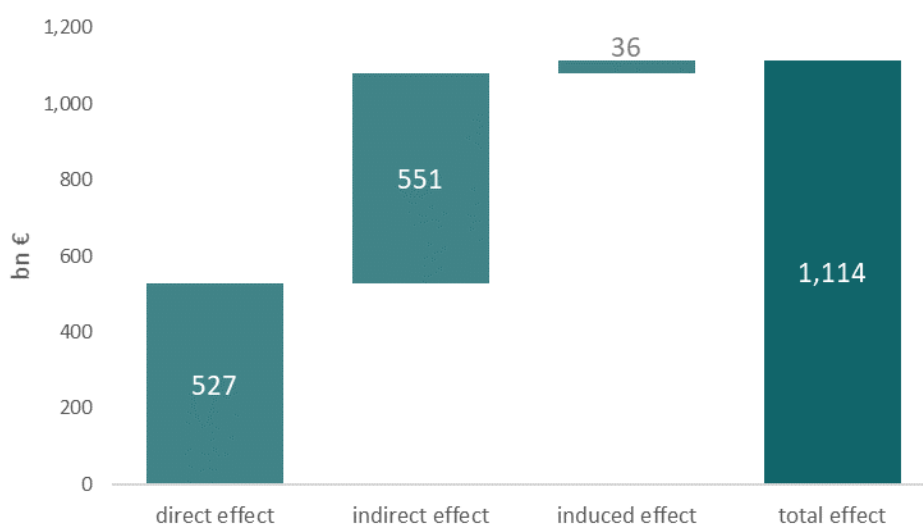


## 7 Economic Impact of Forestry and Wood in the broader sense

### 7.1 Gross value added

In the broadest definition of the forestry and wood industry, 527 bn euros of direct GVA can be reported in the E-30 which is about as much as the GVA of an average EU Member State (Belgium, Poland and Sweden had national GVAs between 400 bn euros und 500 bn euros in 2019). Within the E-30 supply network, another 551 bn euros of GVA are generated and when induced effects from consumption of wages and salaries are considered as well, another 36 bn euros are added. Therefore, a total GVA of wood in its broad sense of 1,114 bn euros can be reported as is shown in Figure 32, which is nearly exactly the national value of Spain for 2019.

Figure 32: GVA of forestry and wood in the broad sense, E-30, 2019

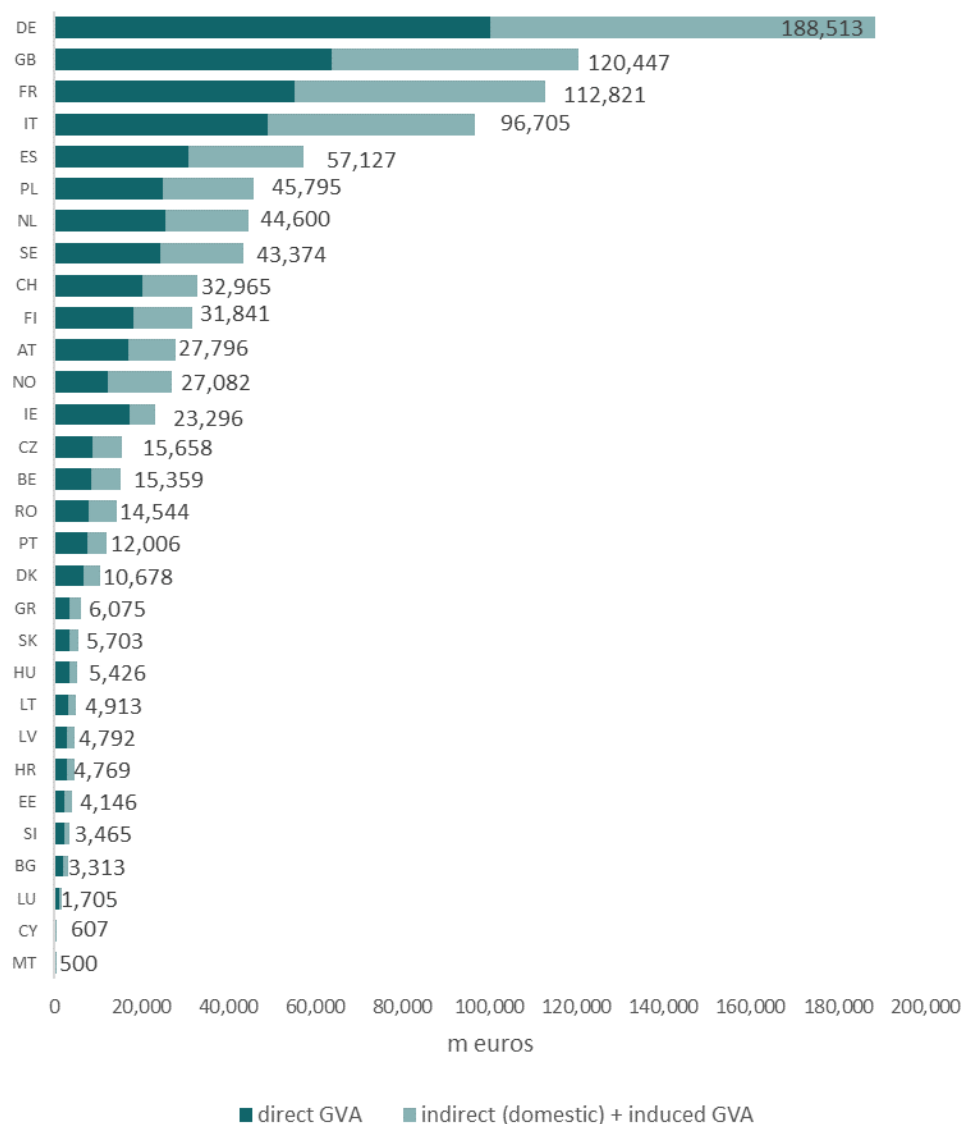


Source: Own calculations.

The multiplier, that is the ratio of the total to the direct amount, equals 2.11 meaning that for each euro of GVA generated directly in a forestry- or wood-related company, another 1.11 euros of GVA are generated somewhere else in the E-30 supply network. As standard multipliers are around 1.5 or a little above, the number found for wood in the broad sense can be considered high.

The absolute GVA-values on the country level can be seen in Figure 33. The highest number is found in Germany with just above 100 bn euros direct and 189 bn euros total effects. The United Kingdom, France and Italy follow with roughly 50 bn euros to 60 bn euros direct effects and 100 bn euros to 120 bn euros of total effects. Spain, Poland, the Netherlands and Sweden report between 40 bn euros and 60 bn euros of total effects.

Figure 33: Domestic GVA of forestry and wood in the broad sense



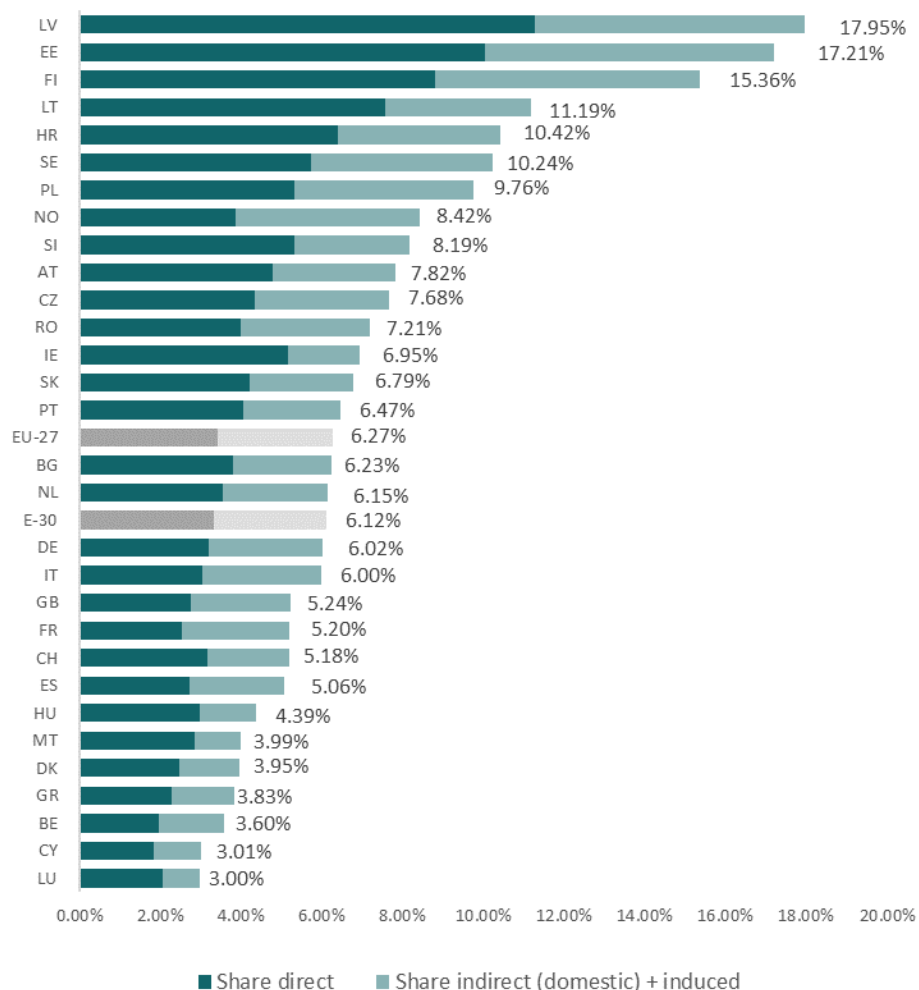
Source: Own calculations.

The ranking of total effects – as in the figure – is similar to that of direct effects which once more indicates that the supply structures are very comparable and lead to similar multiplicative effects over the countries.

Given the already substantial shares of forestry and wood in the narrow sense, it can be expected that the even larger broad sense increases these shares once again. Indeed, numbers shown in Figure 34 show the strong influence forestry and wood have on many E-30 countries. The economies of Latvia, Estonia and Finland depend to more than 15 per cent directly or indirectly on this industry. In Latvia and Estonia, even direct effects are above

10 per cent. With the exception of Croatia, all countries leading in this ranking are from the north or northeast of the E-30.

Figure 34: Shares of GVA of forestry and wood in the broad sense, in %



Source: Own calculations.

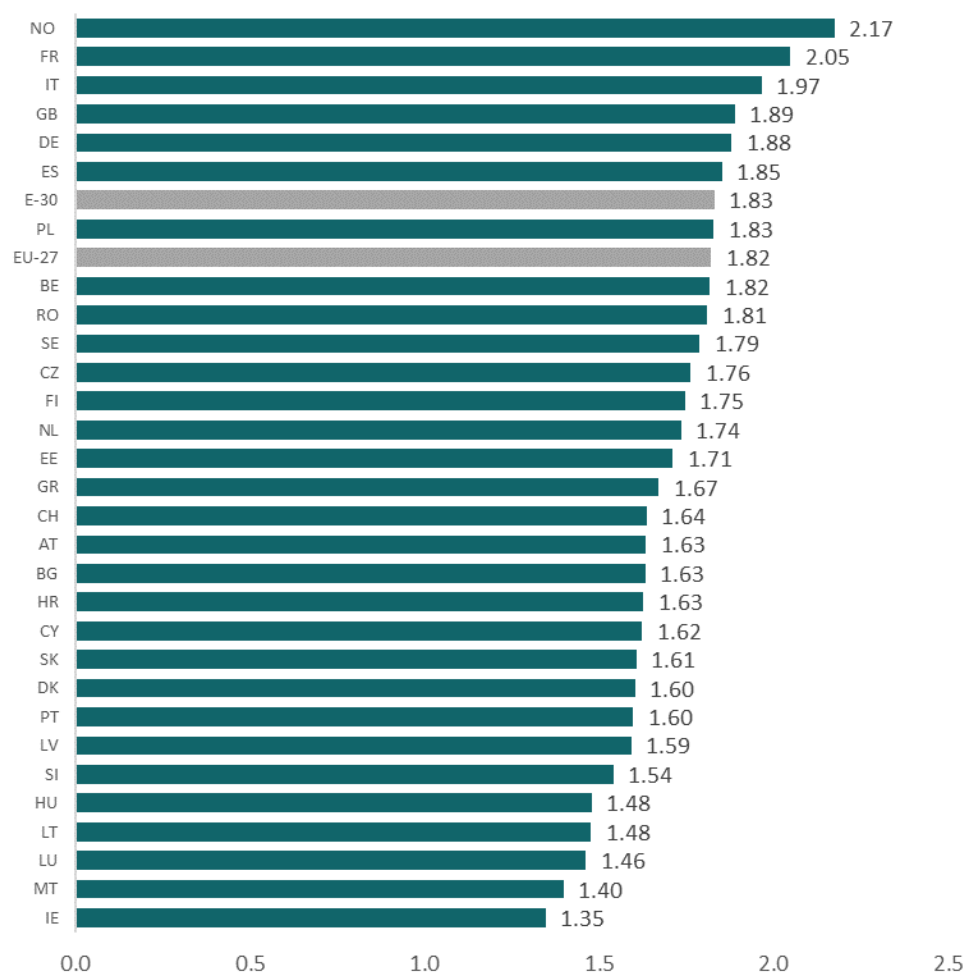
On average, the forestry- and wood-related industry in its broad sense generate 6.27 per cent of GVA in the EU-27 directly or indirectly. In the E-30, the share is at 6.12 per cent. That means that in the EU-27, every 16<sup>th</sup> euro is directly or indirectly generated by this industry, while it is just below every 16<sup>th</sup> euro in the E-30.

The multipliers shown in Figure 35 are high and less variable than for some of the smaller definitions which was already indicated by the similar rankings when direct and total effects are considered. The highest can be found in Norway where for every euro of GVA in forestry and wood in the broad sense, another 1.17 euros of GVA in the domestic economy can be reported due to supply chain and consumption effects. For the E-30 and EU-27, values of

1.83 and 1.82 could be calculated which are a little below those of the narrow definition (1.90 for both definitions), but still of substantial size. Even for countries with comparatively low multipliers, they can still be considered average.

As the multipliers use domestic indirect effects only, they would increase if indirect effects within the E-30 would be used. This can be seen by the fact that the E-30 multiplier here equals 1.88, while it is 2.11 in Figure 32. As was noted before, multipliers can be influenced by several factors, so they should be treated as indicators of the order of magnitude.

Figure 35: Domestic GVA multipliers of forestry and wood in the broad sense



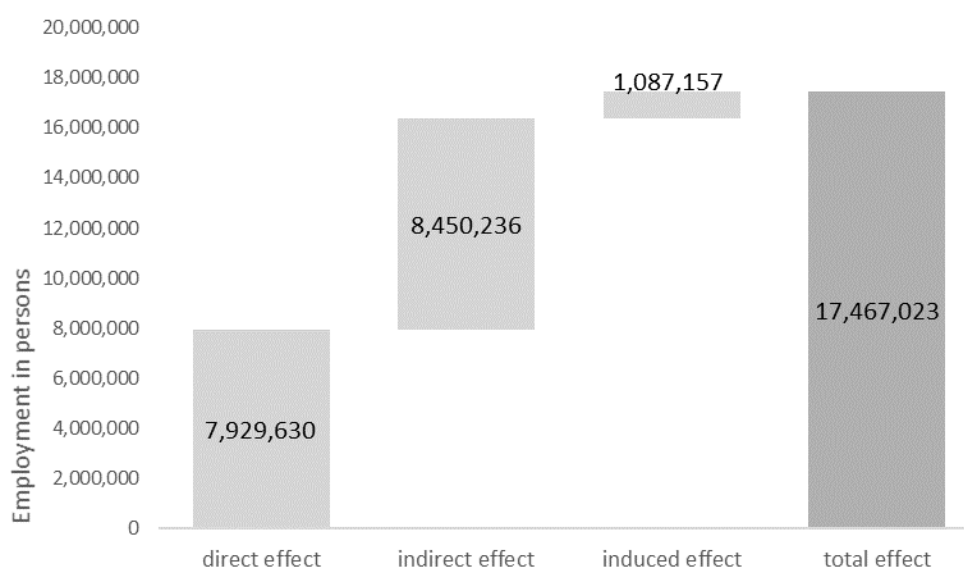
Source: Own calculations.

## 7.2 Employment

The broad definition of forestry and wood is the most important one in terms of economic size. Figure 36 reports the number of direct employees in the E-30 to be 7.9 m persons, about as much as Denmark (5.8 m inhabitants in 2021) and Slovenia (2.1 m inhabitants in

2021) together. Indirect effects caused by purchases of intermediate goods and services in the E-30 are numbered at nearly 8.5 m persons, just a little less than the population of Switzerland (8.7 m inhabitants in 2021). The induced effects of around 1.1 m persons can be compared to the size of Cyprus (920.000 inhabitants in 2021) or Estonia (1.3 m inhabitants in 2021). Total employment is around 17.5 m persons which equals the population of the Netherlands (17.5 m inhabitants in 2021) which is the 7<sup>th</sup> most populous Member State of the EU-27.<sup>11</sup>

Figure 36: Employment of forestry and wood in the broad sense, E-30, 2019



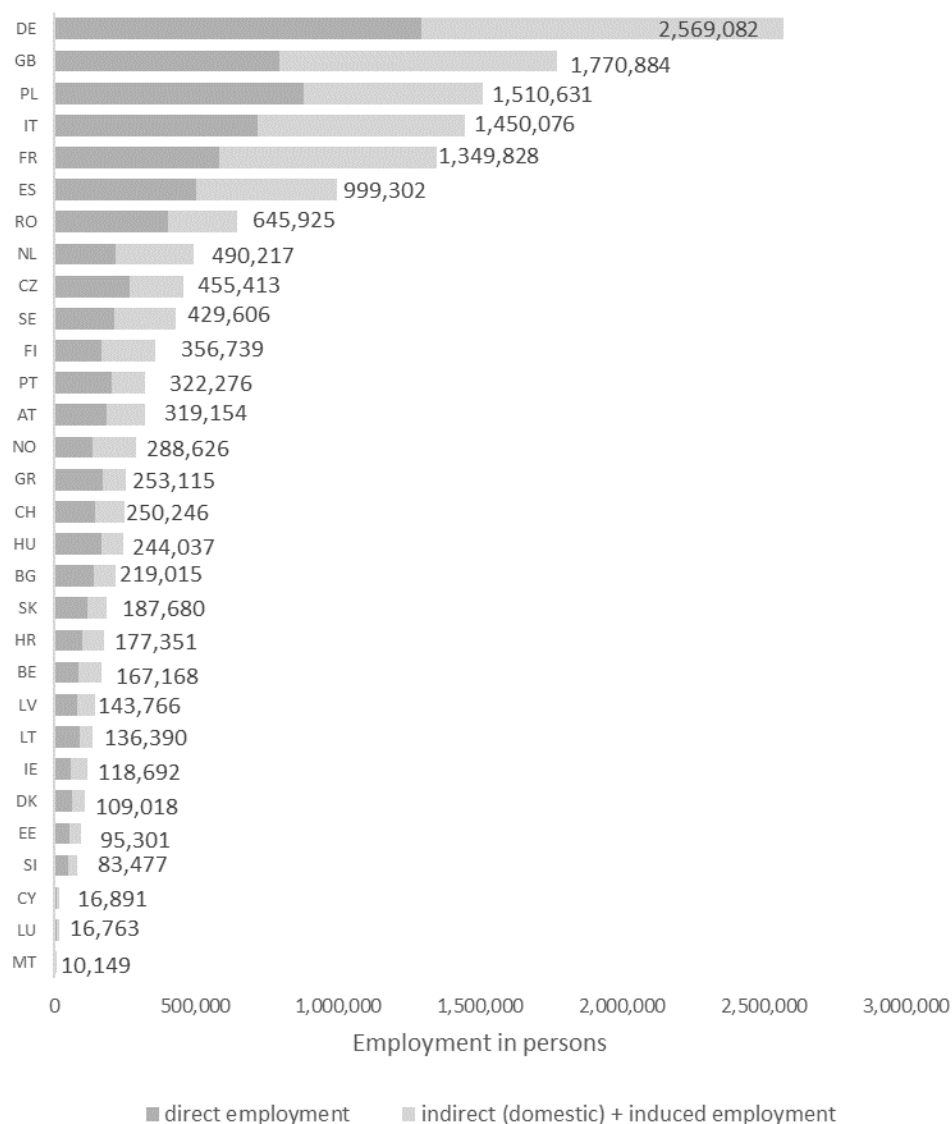
Source: Own calculations.

Dividing the total effect by the direct effect yields a multiplier of 2.20. Thus, for every person employed directly in a company belonging to the broad definition, another 1.20 persons are employed either due to the effects in the supply network or due to the employees' consumption of wages and salaries.

With nearly 1.3 m people directly and more than 2.5 m people employed in total, Germany is the largest employer. Number 2 in the ranking is the United Kingdom, followed by Poland, Italy and France, each showing more than 1 m total employees – Spain just scratched that threshold. Total employment may be of the size of a capital city in the upper ranks of Figure 37 and even in the lower ones, employment numbers are substantial, keeping in mind that those are typically the smaller countries.

<sup>11</sup> All population values see Eurostat indicator CENS\_21AG or [https://ec.europa.eu/eurostat/databrowser/view/CENS\\_21AG/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/CENS_21AG/default/table?lang=en)

Figure 37: Domestic employment of forestry and wood in the broad sense, 2019



Source: Own calculations.

Speaking of national importance, Figure 38 shows the shares of forestry's and the wood industry's employment in their national employment. The largest values can be found in Latvia, Estonia and Finland with more than 13 per cent employment. Croatia, Norway and Lithuania report close to 10 per cent, Poland, Sweden and the Czech Republic more than 8 per cent. When direct employment is considered, the ranking is similar with the exception of Lithuania being ranked 3<sup>rd</sup> and Poland as well as the Czech Republic also gaining ranks.

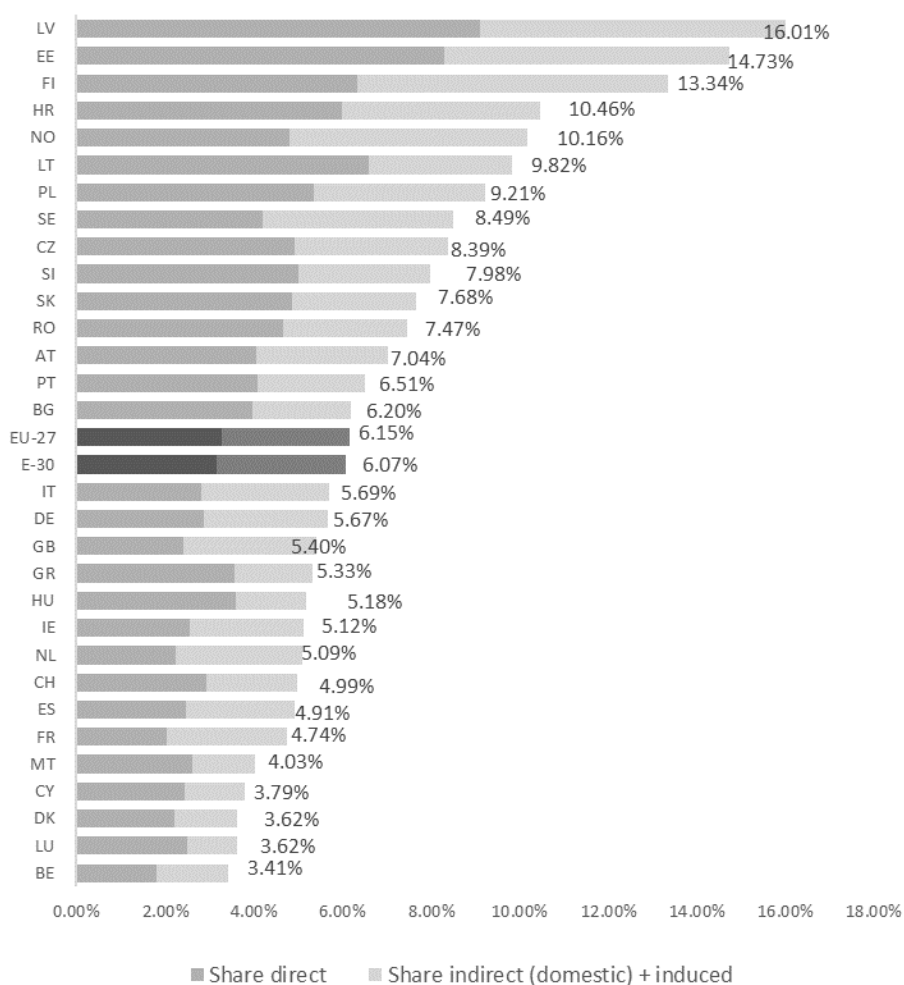
On average, the share for the EU-27 equals 6.15 per cent and for the E-30 6.07 per cent which is a little below the respective GVA-shares of 6.27 per cent and 6.12 per cent. The broad definition is thus the only definition which is – calculated over the whole E-30 or EU-

27 – GVA-intensive, meaning that a higher share of GVA is generated compared to employment.

The above numbers indicate that every 16<sup>th</sup> person in the EU-27 or E-30 is employed either directly or due to indirect or induced effects of forestry and the wood industry in the broad sense.

Taking a look at the map, the highest shares can be found in the north and northeast with the interesting exception of Croatia on rank 4.

Figure 38: Shares of employment of forestry and wood in the broad sense, in %

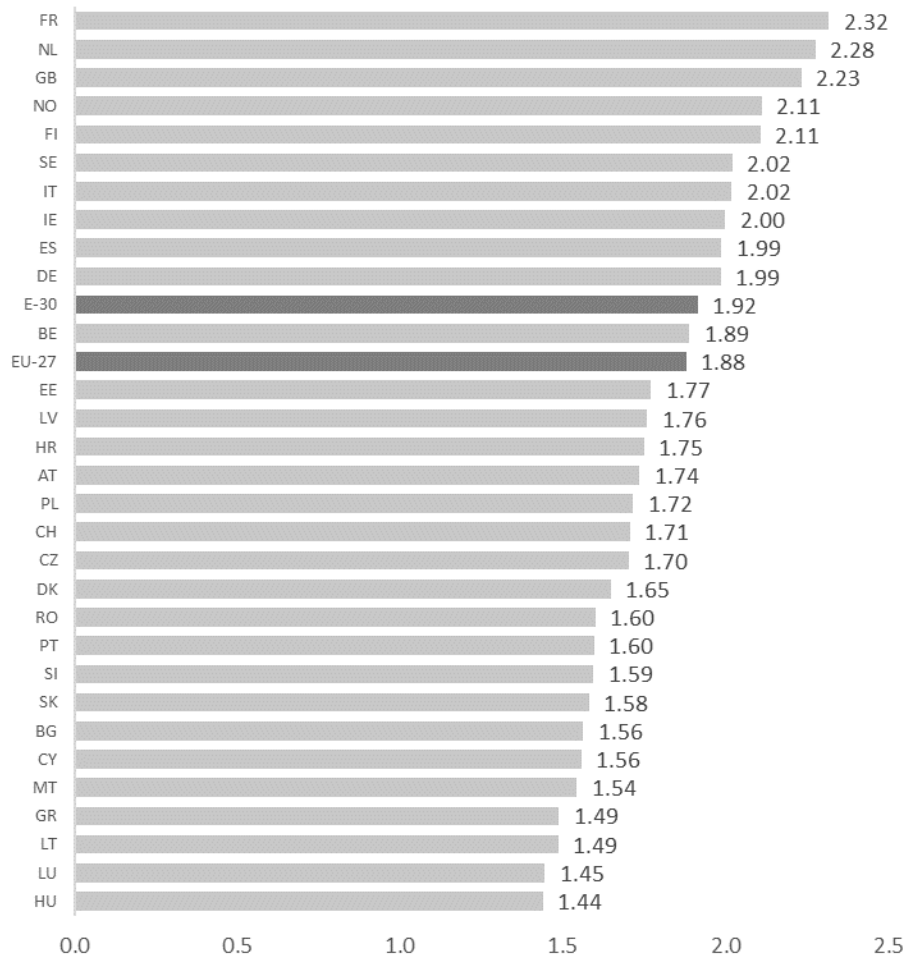


Source: Own calculations.

Country-based multipliers are depicted in Figure 39. Ranging from 1.44 to 2.32, they range well above their GVA-counterparts (1.35 to 2.17). As can be expected from that, the multipliers for the E-30 and EU-27 of the broad definition (1.92 and 1.88) are above the

GVA-values (1.82 and 1.83). Thus, on average for every person working directly in forestry or the wood industry in the broad sense, another 0.92 (0.88) persons are employed due to purchases from the national supply network or consumption of wages and salaries.

Figure 39: Domestic employment multipliers of forestry and wood in the broad sense



Source: Own calculations.



## 8 Simulation

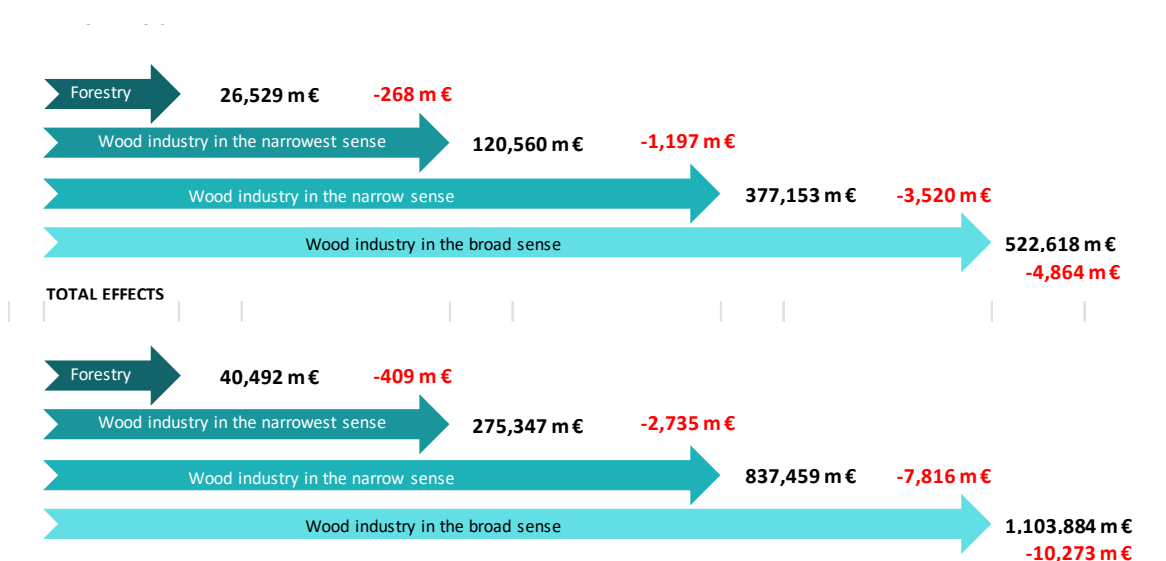
A satellite account for the forestry and wood industry can be used not only to map the economic importance of the sector, but also to calculate simulations: These include, for example, how changes in supply, demand, price increases or even trade tariffs can affect the economy.

In the context of this study, a concrete simulation is to be carried out as an example: the question is how a one percent reduction in logging would affect value added and employment in the 30 European countries taken into consideration (E-30).

And the results are remarkable, as the following figures show:

In the forestry sector itself, the reduction in logging has a 1:1 effect on value added and employment, i.e. one would not only have to reckon with a direct drop in value added of 268 m euros, but also with the loss of 5,342 jobs. Due to the lower economic activity in the forestry sector, lower turnover and thus a decrease in value added would also have to be recorded for the suppliers in the upstream value chain (indirect effects). Negative effects on the labour market, on the other hand, would have a negative impact on the income effects, i.e. lead to a reduction in the induced effects. Overall, a loss of almost 8,000 jobs would have to be expected in the 30 countries, and value added would decline by € 409 m.

Figure 40: Direct and total effects of a 1% reduction in logging on GVA, E-30



Source: Own calculations.

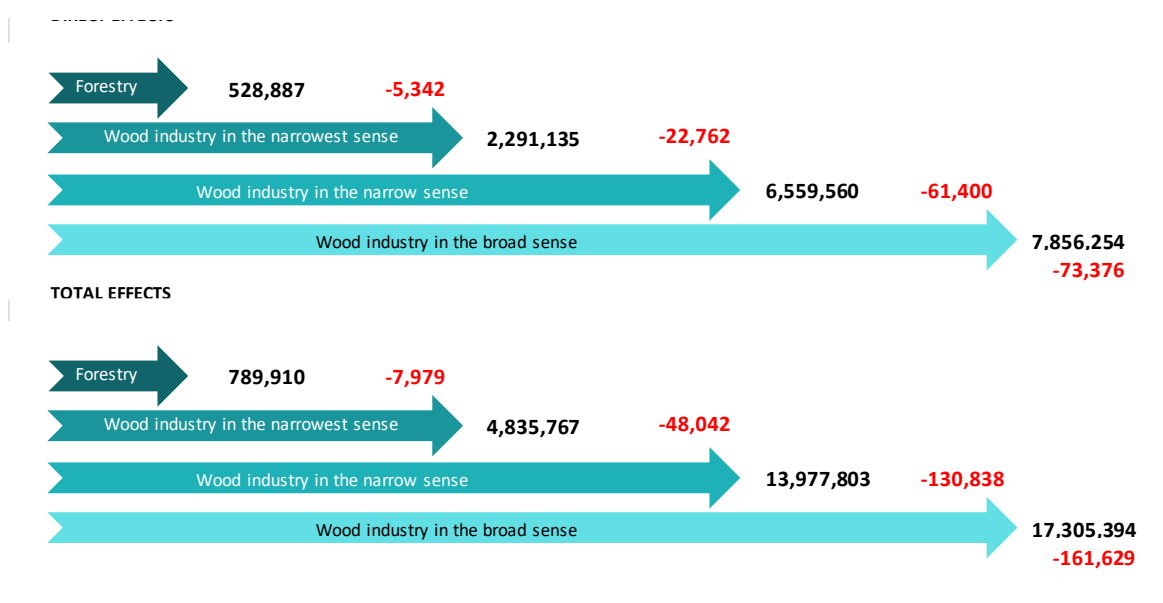
Forestry is at the beginning of the timber value chain. A lower supply through forestry would therefore also have an impact on all downstream sectors that are depicted in the three other definitions.

Thus, even with the definition in the narrowest sense, the decrease in value added would amount to € 2.735 m, of which € 1.197 m would be direct. More than 48,000 jobs, 22,762 of them in the timber industry, would be at risk. This corresponds to a value added and employment minus of 0.98%.

In the definition in the narrow sense, the losses increase by leaps and bounds: 3.520 m € directly or 7.816 m € in total would be recorded in value added minus, which corresponds to a decrease of 0.92% to the figures shown in chapter xx. 61,400 jobs in the timber industry and another 69,438 jobs in other sectors would be directly endangered. This also corresponds to a decline of 0.93%.

In the broadest definition, the value added minus increases to 10.273 m € total or 0.92%. Almost 162,000 jobs would be at risk with a 1% reduction in logging alone.

Figure 41: Direct and total effects of a 1% reduction in logging on employment, E-30



Source: Own calculations.

## 9 Conclusion

Forests are an important aspect of our society, e. g. as CO<sub>2</sub> capture, wildlife habitat or for recreational purposes. As this study underlines, forestry and the wood industry are also of major economic significance generating a total gross value added of 1,114 billion € within the E-30 (Eu-27, Norway, Switzerland and the United Kingdom). Further, a total of 17.5 million employees are connected to forestry and the wood industry as well as in the connected network of suppliers.

To quantify the economic effects of forestry and the wood industry it was necessary to agree upon a common definition within the frame of statistical classifications. However, this posed the first issues, since for some wood-relevant products and services, no actual good exists in the current classification systems. This is especially true for innovative and rather new products and services as for example within the textile or construction industry. Also finding the relevant share of those products and services within a superordinate class of products and services is associated with difficulties, since data on it does hardly exist (in a consistent manner across countries).

The issue regarding data availability is a general one (detail, comparability, general availability). Although Eurostat offers a wide range of comparable data some problems with it may occur. For example, different classifications / details of classification or nondisclosures are an issue especially for smaller countries. Further, non-EU members sometimes do not provide certain data or years (e. g. the UK since 2019). If there is no data available on Eurostat three main difficulties arise: i) data on certain products and services do not exist at all, ii) data on certain products and services exist only for some countries or on a high aggregation level (total EU, worldwide), iii) data on certain products and services exist for all countries but are measured in different way and are thus hardly comparable.

As a concluding remark of the study, it is necessary to say, that although the economic effects of forestry and the wood industry are of major significance, forests and woods offer by far more than just an economic value of wood and timber products and their connected goods. The tangible and intangible value of forests as e. g. CO<sub>2</sub> sinks, wildlife habitat, touristic destination but also for personal physical and psychical recreation should not be underestimated and taken into account when the value of forests, forestry and the wood industry are discussed.

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## Appendix: Definition

Forestry			
CPA 2.1.	CPA 2.1. (detail)	Description (CPA 2.1)	Comment
A 02	A 02	Products of forestry, logging and related services	Except: A 02.3
Wood industry in the narrowest sense			
CPA 2.1.	CPA 2.1. (detail)	Description (CPA 2.1)	Comment
C 16	C 16	Wood and products of wood and cork, except furniture; articles of straw and plaiting material	Except: C16.29.25 Manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork
C 17	C 17	Paper and paper products	Except: C 17.24.12 Textile wall coverings
Wood industry in a narrow sense			
CPA 2.1.	CPA 2.1. (detail)	Description (CPA 2.1)	Comment
C 13	C 13	Textiles	Wood-relevant share
C 18	C 18.1	Printing service and services related to printing	total
C 20	C 20.14.71	Wood tar	total
C 20	C 20.14.72	Wood Charcoal	total
C 20	C 20.16.59	Cellulose acetat	total
C 20	C 20.51.20	Matches	total
C 20	C 20.60.21	Artificial staple and tow, not carded or combed	Wood-relevant share
C 20	C 20.60.24	Artificial monofilament; strip and the like of artificial textile materials	Wood-relevant share
C 30	C 30.12.11	Sailboats (except inflatable) for pleasure or sports, with or without auxiliary motor	Wood-relevant share
C 30	C 30.12.19	Other vessels for pleasure or sports; rowing boats and canoes	Wood-relevant share
C 30	C 30.12.99	Sub-contracted operations as part of manufacturing of pleasure and sporting boats	Wood-relevant share
C 31	C 31.00.12	Seats, primarily with wooden frames	total
C 31	C 31.00.14	Parts of seats	Wood-relevant share
C 31	C 31.00.20	Parts of furniture (excepts seats)	Wood-relevant share
C 31	C 31.01.12	Wooden furniture of a kind used in offices	total
C 31	C 31.01.13	Wooden furniture for shops	total
C 31	C 31.02.10	Kitchen furniture	Wood-relevant share
C 31	C 31.09.12	Wooden furniture of a kind used in the bedroom, dining room and the living room	total
C 31	C 31.09.13	Wooden furniture n.e.c.	total
C 32	C 32.20.11	Pianos and other keyboard stringed musical instruments	Wood-relevant share
C 32	C 32.20.12	Other string musical instruments	Wood-relevant share

C 32	C 32.20.20	Parts and accessories of musical instruments	Wood-relevant share
C 32	C 32.20.99	Sub-contracted operations as part of manufacturing of musical instruments	Wood-relevant share
C 32	C 32.30.11	Snow-skis and other snow-ski equipment, except footwear; ice skates and roller skates; parts thereof	Wood-relevant share
C 32	C 32.30.12	Snow-ski footwear	Wood-relevant share
C 32	C 32.30.13	Water-skis, surfboards, sailboards and other water-sport equipment	Wood-relevant share
C 32	C 32.30.16	Fishing rods, other line fishing tackle; articles for hunting or fishing n.e.c.	Wood-relevant share
C 32	C 32.30.99	Sub-contracted operations as part of manufacturing of sports goods	Wood-relevant share
C 32	C 32.40.11	Dolls representing only human beings	Wood-relevant share
C 32	C 32.40.12	Toys representing animals or non-human creatures	Wood-relevant share
C 32	C 32.40.13	Parts and accessories of dolls representing human beings	Wood-relevant share
C 32	C 32.40.20	Toy trains and their accessories; other reduced-size models or construction sets and constructional toys	Wood-relevant share
C 32	C 32.40.31	Wheeled toys designed to be ridden by children; dolls' carriages	Wood-relevant share
C 32	C 32.40.32	Puzzles	Wood-relevant share
C 32	C 32.40.39	Games and toys n.e.c.	Wood-relevant share
C 32	C 32.40.42	Articles for billiards, articles for funfair, table or parlour games; other games, coin- or disc-operated	Wood-relevant share
C 32	C 32.91.11	Brooms and brushes for household cleaning	Wood-relevant share
C 32	C 32.91.12	Tooth brushes, hair brushes and other toilet brushes for use on the person; artists' brushes, writing brushes and brushes for cosmetics	Wood-relevant share
C 32	C 32.91.19	Other brushes n.e.c.	Wood-relevant share
C 32	C 32.91.99	Sub-contracted operations as part of manufacturing of brooms and brushes	Wood-relevant share
C 32	C 32.99.14	Sets of writing implements, pen- and pencil-holders and similar holders; parts thereof	Wood-relevant share
C 32	C 32.99.15	Pencils, crayons, pencil leads, pastels, drawing charcoals, writing or drawing chalks and tailors' chalks	Wood-relevant share
C 32	C 32.99.21	Umbrellas and sun umbrellas; walking-sticks, seat-sticks and the like	Wood-relevant share
C 32	C 32.99.99	Sub-contracted operations as part of manufacturing of other manufactured goods n.e.c.	Wood-relevant share
E 38	E 38.11.52	Paper and paperboard waste	
E 38	E 38.11.59	Other non-hazardous recyclable waste n.e.c.	Wood-relevant share
E 38	E 38.2	Waste treatment and disposal	Wood-relevant share
E 38	E 38.32.32	Secondary raw material of paper and paperboard	Wood-relevant share
F 41	F 41	Buildings and building construction works	Wood-relevant share
F 42	F 42	Constructions and construction works for civil engineering	Wood-relevant share
F 43	F 43	Specialised construction works	Wood-relevant share

J 58	J 58.11.1	Printed books	total
J 58	J 58.11.41	Advertising Space in books, printed	total
J 58	J 58.12.1	Directories and mailing lists printed or on physical media	total
J 58	J 58.13.1	Printed newspaper	total
J 58	J 58.13.31	Advertising space in newspaper, printed	total
J 58	J 58.14.1	Printed journals and periodicals	total
J 58	J 58.14.31	Advertising space in journals and periodicals, printed	total
J 58	J 58.19.1	Other printed matter publishing service	total
M 71	M 71	Architectural and engineering service; technical testing and analysis services	Wood-relevant share
<b>Wood industry in a broad sense</b>			
CPA 2.1.	CPA 2.1. (detail)	Description (CPA 2.1)	Comment
A 01	A 01.2	Perennial crops	Wood-relevant share (fruits growing on trees)
A 01	A 01.70.10	Hunting and trapping and related services	total
A 02	A 02.3	Wild growing non-wooden products	total
C 23	C 23.65.11	Boards, blocks and similar articles of vegetable fibre, straw or wood waste, agglomerated with mineral binders	Wood-relevant share
C 23	C 23.65.12	Articles of asbestos-cement, cellulose fibre-cement or the like	Wood-relevant share
C 23	C 23.65.99	Sub-contracted operations as part of manufacturing of articles of fibre cement	Wood-relevant share
C 23	C 23.99.19	Non-metallic mineral products n.e.c.	Wood-relevant share
C 23	C 23.99.99	Sub-contracted operations as part of manufacturing of other non-metallic mineral products n.e.c.	Wood-relevant share
C 28	C 28.30.33	Seeders, planters and transplanters	total
C 28	C 28.30.34	Manure spreaders and fertiliser distributors	Wood-relevant share
C 28	C 28.30.39	Other soil machinery	Wood-relevant share
C 28	C 28.30.54	Root or tuber harvesting machines	total
C 28	C 28.30.59	Harvesting and threshing machinery n.e.c.	total
C 28	C 28.30.60	Machinery for projecting, dispersing or spraying liquids or powders for agriculture or horticulture	Wood-relevant share
C 28	C 28.30.70	Self-loading or unloading trailers and semi-trailers for agriculture	Wood-relevant share
C 28	C 28.30.86	Agricultural, horticultural, forestry, poultry- or bee-keeping machinery n.e.c.	Wood-relevant share
C 28	C 28.30.91	Parts of harvester and threshers n.e.c.	total
C 28	C 28.30.92	Parts of soil machinery	Wood-relevant share
C 28	C 28.30.99	Sub-contracted operations as part of manufacturing of agricultural and forestry machinery	Wood-relevant share
C 28	C 28.49.12	Machine tools for working wood, cork, bone, hard rubber, hard plastics or similar hard materials; electroplating machinery	Wood-relevant share
C 28	C 28.95.11	Machinery for paper and paperboard production, except parts thereof	total



C 28	C 28.95.12	Parts of machinery for paper and paperboard production	total
C 28	C 28.95.99	Sub-contracted operations as part of manufacturing of machinery for paper and paperboard production	total
C 28	C 28.99.11	Book-binding machinery, including book-sewing machines	total
C 28	C 28.99.12	Machinery, apparatus and equipment, for type-setting, for preparing or making printing blocks, plates	total
C 28	C 28.99.13	Offset printing machinery, excluding those of the office type	total
C 28	C 28.99.14	Other printing machinery, excluding those of the office type	total
C 28	C 28.99.31	Dryers for wood, paper pulp, paper or paperboard; non-domestic dryers n.e.c.	total
C 28	C 28.99.40	Parts of printing and book-binding machinery	total
D 35	D 35	Electricity, gas, steam and air conditioning supply	Wood-relevant share
G 46	G 46	Wholesale trade services, except of motor vehicles and motorcycles	Wood-relevant share of trade margins
G 47	G 47	Trade margin	Wood-relevant share of trade margins
H 49	H 49	Land transport services and transport services via pipelines	Wood-relevant share of transport margins
H 50	H 50	Water transport services	Wood-relevant share of transport margins
H 52	H 52	Warehousing and support services for transportation	Wood-relevant share of transport margins
K 65	K 65	Insurance services	Wood-relevant share
M 72	M 72.19.50	Research and experimental development services in agricultural sciences	Wood-relevant share
M 72	M 72.19.7	Research and development originals in other natural sciences and engineering	Wood-relevant share
N 82	N 82.30.11	Convention organisation services	Wood-relevant share
N 82	N 82.30.12	Trade show organisation services	Wood-relevant share
O 84	O 84.13.11	Administrative agriculture-, forestry-, fishing- and hunting-related services	Wood-relevant share
P 85	P 85.32	Technical and vocational secondary education services	Wood-relevant share
P 85	P 85.42	Tertiary education services	Wood-relevant share
S 94	S 94.11.10	Services furnished by business and employers membership organisations	Wood-relevant share
S 94	S 94.12.10	Services furnished by professional membership organisations	Wood-relevant share
S 94	S 94.20.10	Services furnished by trade unions	Wood-relevant share
S 94	S 94.99.12	Services furnished by environmental advocacy groups	Wood-relevant share
S 94	S 94.99.13	Special group protection services	Wood-relevant share
S 94	S 94.99.19	Services provided by other membership organisations n.e.c.	Wood-relevant share

## Appendix: Country Sheets

### AT – Austria

Forestry					
Gross Value Added			Employment		
	Million €	% of national GVA		Persons	% of national employment
Direct Effect	1 031	0,29%	Direct Effect	21 210	0,47%
Total Effect*	1 281	0,36%	Total Effect*	24 091	0,53%
Multiplier	1,24		Multiplier	1,14	

Wood industry in the narrowest sense					
Gross Value Added			Employment		
	Million €	% of national GVA		Persons	% of national employment
Direct Effect	5 597	1,58%	Direct Effect	71 785	1,58%
Total Effect*	9 162	2,58%	Total Effect*	114 496	2,52%
Multiplier	1,64		Multiplier	1,59	

Wood industry in the narrow sense					
Gross Value Added			Employment		
	Million €	% of national GVA		Persons	% of national employment
Direct Effect	11 625	3,27%	Direct Effect	155 166	3,42%
Total Effect*	20 069	5,65%	Total Effect*	259 525	5,72%
Multiplier	1,73		Multiplier	1,67	

Wood industry in the broad sense					
Gross Value Added			Employment		
	Million €	% of national GVA		Persons	% of national employment
Direct Effect	17 010	4,79%	Direct Effect	183 906	4,06%
Total Effect*	27 796	7,82%	Total Effect*	319 154	7,04%
Multiplier	1,63		Multiplier	1,74	

Total Effect\*: direct, indirect (domestic)+ induced effect

**BE – Belgium**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	118	0,03%	Direct Effect	2 241	0,05%
Total Effect*	238	0,06%	Total Effect*	3 529	0,07%
Multiplier	2,01		Multiplier	1,57	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 077	0,49%	Direct Effect	29 143	0,60%
Total Effect*	3 831	0,90%	Total Effect*	47 729	0,98%
Multiplier	1,84		Multiplier	1,64	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	5 667	1,33%	Direct Effect	76 489	1,56%
Total Effect*	11 056	2,59%	Total Effect*	137 309	2,81%
Multiplier	1,95		Multiplier	1,80	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	8 446	1,98%	Direct Effect	88 430	1,81%
Total Effect*	15 359	3,60%	Total Effect*	167 168	3,41%
Multiplier	1,82		Multiplier	1,89	

Total Effect\*: direct, indirect (domestic)+ induced effect

**BG – Bulgaria**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	207	0,39%	Direct Effect	23 444	0,66%
Total Effect*	285	0,54%	Total Effect*	28 546	0,81%
Multiplier	1,37		Multiplier	1,22	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	590	1,11%	Direct Effect	55 039	1,56%
Total Effect*	899	1,69%	Total Effect*	74 002	2,09%
Multiplier	1,52		Multiplier	1,34	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 340	2,52%	Direct Effect	116 900	3,31%
Total Effect*	2 253	4,24%	Total Effect*	172 593	4,88%
Multiplier	1,68		Multiplier	1,48	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 029	3,82%	Direct Effect	140 082	3,96%
Total Effect*	3 313	6,23%	Total Effect*	219 015	6,20%
Multiplier	1,63		Multiplier	1,56	

Total Effect\*: direct, indirect (domestic)+ induced effect

**CH – Switzerland**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	325	0,05%	Direct Effect	6 158	0,12%
Total Effect*	513	0,08%	Total Effect*	7 906	0,16%
Multiplier	1,58		Multiplier	1,28	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	4 513	0,71%	Direct Effect	48 709	0,97%
Total Effect*	7 469	1,17%	Total Effect*	72 097	1,44%
Multiplier	1,66		Multiplier	1,48	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	14 558	2,29%	Direct Effect	134 584	2,68%
Total Effect*	23 677	3,72%	Total Effect*	209 411	4,17%
Multiplier	1,63		Multiplier	1,56	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	20 152	3,17%	Direct Effect	146 593	2,92%
Total Effect*	32 965	5,18%	Total Effect*	250 246	4,99%
Multiplier	1,64		Multiplier	1,71	

Total Effect\*: direct, indirect (domestic)+ induced effect

**CY – Cyprus**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	24	0,12%	Direct Effect	470	0,11%
Total Effect*	28	0,14%	Total Effect*	599	0,13%
Multiplier	1,17		Multiplier	1,28	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	91	0,45%	Direct Effect	3 457	0,78%
Total Effect*	132	0,65%	Total Effect*	4 554	1,02%
Multiplier	1,45		Multiplier	1,32	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	233	1,16%	Direct Effect	8 591	1,93%
Total Effect*	408	2,02%	Total Effect*	13 158	2,96%
Multiplier	1,75		Multiplier	1,53	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	374	1,85%	Direct Effect	10 847	2,44%
Total Effect*	607	3,01%	Total Effect*	16 891	3,79%
Multiplier	1,62		Multiplier	1,56	

Total Effect\*: direct, indirect (domestic)+ induced effect

**CZ – Czech Republic**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	534	0,26%	Direct Effect	19 503	0,36%
Total Effect*	1 000	0,49%	Total Effect*	32 753	0,60%
Multiplier	1,87		Multiplier	1,68	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 805	1,38%	Direct Effect	97 274	1,79%
Total Effect*	4 956	2,43%	Total Effect*	158 191	2,91%
Multiplier	1,77		Multiplier	1,63	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	6 523	3,20%	Direct Effect	232 305	4,28%
Total Effect*	11 849	5,81%	Total Effect*	380 740	7,01%
Multiplier	1,82		Multiplier	1,64	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	8 883	4,36%	Direct Effect	267 406	4,92%
Total Effect*	15 658	7,68%	Total Effect*	455 413	8,39%
Multiplier	1,76		Multiplier	1,70	

Total Effect\*: direct, indirect (domestic)+ induced effect

**DE – Germany**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 042	0,10%	Direct Effect	38 712	0,09%
Total Effect*	4 215	0,13%	Total Effect*	57 490	0,13%
Multiplier	1,39		Multiplier	1,49	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	20 975	0,67%	Direct Effect	321 950	0,71%
Total Effect*	43 256	1,38%	Total Effect*	637 617	1,41%
Multiplier	2,06		Multiplier	1,98	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	74 459	2,38%	Direct Effect	1 118 103	2,47%
Total Effect*	144 580	4,62%	Total Effect*	2 111 091	4,66%
Multiplier	1,94		Multiplier	1,89	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	100 274	3,20%	Direct Effect	1 294 040	2,86%
Total Effect*	188 513	6,02%	Total Effect*	2 569 082	5,67%
Multiplier	1,88		Multiplier	1,99	

Total Effect\*: direct, indirect (domestic)+ induced effect



**DK – Denmark**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	236	0,09%	Direct Effect	6 000	0,20%
Total Effect*	353	0,13%	Total Effect*	7 228	0,24%
Multiplier	1,50		Multiplier	1,20	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 186	0,44%	Direct Effect	19 852	0,66%
Total Effect*	1 946	0,72%	Total Effect*	27 395	0,91%
Multiplier	1,64		Multiplier	1,38	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	4 455	1,65%	Direct Effect	59 091	1,96%
Total Effect*	7 394	2,73%	Total Effect*	90 461	3,01%
Multiplier	1,66		Multiplier	1,53	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	6 659	2,46%	Direct Effect	66 157	2,20%
Total Effect*	10 678	3,95%	Total Effect*	109 018	3,62%
Multiplier	1,60		Multiplier	1,65	

Total Effect\*: direct, indirect (domestic)+ induced effect

**EE – Estonia**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	326	1,36%	Direct Effect	6 109	0,94%
Total Effect*	620	2,58%	Total Effect*	13 157	2,03%
Multiplier	1,90		Multiplier	2,15	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	979	4,06%	Direct Effect	25 720	3,98%
Total Effect*	1 897	7,88%	Total Effect*	47 374	7,32%
Multiplier	1,94		Multiplier	1,84	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 435	5,96%	Direct Effect	43 300	6,69%
Total Effect*	2 654	11,02%	Total Effect*	72 995	11,28%
Multiplier	1,85		Multiplier	1,69	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 422	10,05%	Direct Effect	53 766	8,31%
Total Effect*	4 146	17,21%	Total Effect*	95 301	14,73%
Multiplier	1,71		Multiplier	1,77	

Total Effect\*: direct, indirect (domestic)+ induced effect

**ES – Spain**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 267	0,11%	Direct Effect	14 888	0,07%
Total Effect*	1 445	0,13%	Total Effect*	18 370	0,09%
Multiplier	1,14		Multiplier	1,23	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	7 067	0,63%	Direct Effect	113 107	0,56%
Total Effect*	14 087	1,25%	Total Effect*	249 750	1,23%
Multiplier	1,99		Multiplier	2,21	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	17 606	1,56%	Direct Effect	337 676	1,66%
Total Effect*	35 469	3,14%	Total Effect*	680 106	3,34%
Multiplier	2,01		Multiplier	2,01	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	30 829	2,73%	Direct Effect	502 891	2,47%
Total Effect*	57 127	5,06%	Total Effect*	999 302	4,91%
Multiplier	1,85		Multiplier	1,99	

Total Effect\*: direct, indirect (domestic)+ induced effect

**FI – Finland**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 841	1,85%	Direct Effect	21 564	0,81%
Total Effect*	4 250	2,05%	Total Effect*	27 132	1,01%
Multiplier	1,11		Multiplier	1,26	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	7 896	3,81%	Direct Effect	62 219	2,33%
Total Effect*	13 548	6,54%	Total Effect*	136 426	5,10%
Multiplier	1,72		Multiplier	2,19	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	13 067	6,30%	Direct Effect	134 746	5,04%
Total Effect*	23 734	11,45%	Total Effect*	278 720	10,42%
Multiplier	1,82		Multiplier	2,07	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	18 228	8,79%	Direct Effect	169 317	6,33%
Total Effect*	31 841	15,36%	Total Effect*	356 739	13,34%
Multiplier	1,75		Multiplier	2,11	

Total Effect\*: direct, indirect (domestic)+ induced effect

**FR – France**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 155	0,15%	Direct Effect	27 759	0,10%
Total Effect*	4 493	0,21%	Total Effect*	46 571	0,16%
Multiplier	1,42		Multiplier	1,68	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	10 727	0,49%	Direct Effect	142 851	0,50%
Total Effect*	21 510	0,99%	Total Effect*	282 098	0,99%
Multiplier	2,01		Multiplier	1,97	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	42 602	1,96%	Direct Effect	514 061	1,80%
Total Effect*	91 256	4,21%	Total Effect*	1 165 307	4,09%
Multiplier	2,14		Multiplier	2,27	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	55 088	2,54%	Direct Effect	582 115	2,04%
Total Effect*	112 821	5,20%	Total Effect*	1 349 828	4,74%
Multiplier	2,05		Multiplier	2,32	

Total Effect\*: direct, indirect (domestic)+ induced effect

**GB – Great Britain**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	720	0,03%	Direct Effect	19 756	0,06%
Total Effect*	1 255	0,05%	Total Effect*	28 787	0,09%
Multiplier	1,74		Multiplier	1,46	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	9 458	0,41%	Direct Effect	152 306	0,46%
Total Effect*	18 120	0,79%	Total Effect*	300 122	0,92%
Multiplier	1,92		Multiplier	1,97	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	51 722	2,25%	Direct Effect	747 735	2,28%
Total Effect*	99 770	4,34%	Total Effect*	1 576 929	4,81%
Multiplier	1,93		Multiplier	2,11	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	63 727	2,77%	Direct Effect	793 187	2,42%
Total Effect*	120 447	5,24%	Total Effect*	1 770 884	5,40%
Multiplier	1,89		Multiplier	2,23	

Total Effect\*: direct, indirect (domestic)+ induced effect

**GR – Greece**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	128	0,08%	Direct Effect	9 275	0,20%
Total Effect*	173	0,11%	Total Effect*	11 295	0,24%
Multiplier	1,35		Multiplier	1,22	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	616	0,39%	Direct Effect	25 624	0,54%
Total Effect*	1 113	0,70%	Total Effect*	43 313	0,91%
Multiplier	1,81		Multiplier	1,69	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 483	0,93%	Direct Effect	74 526	1,57%
Total Effect*	2 767	Total Effect*	Total Effects	117 115	2,46%
Multiplier	1,87		Multiplier	1,57	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 634	2,29%	Direct Effect	170 032	3,58%
Total Effect*	6 075	3,83%	Total Effect*	253 115	5,33%
Multiplier	1,67		Multiplier	1,49	

Total Effect\*: direct, indirect (domestic)+ induced effect

**HR – Croatia**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	373	0,81%	Direct Effect	14 166	0,84%
Total Effect*	559	1,22%	Total Effect*	22 497	1,33%
Multiplier	1,50		Multiplier	1,59	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	782	1,71%	Direct Effect	36 695	2,16%
Total Effect*	1 291	2,82%	Total Effect*	57 568	3,39%
Multiplier	1,65		Multiplier	1,57	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 091	4,57%	Direct Effect	86 251	5,09%
Total Effect*	3 505	7,66%	Total Effect*	144 208	8,50%
Multiplier	1,68		Multiplier	1,67	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 931	6,41%	Direct Effect	101 369	5,98%
Total Effect*	4 769	10,42%	Total Effect*	177 351	10,46%
Multiplier	1,63		Multiplier	1,75	

Total Effect\*: direct, indirect (domestic)+ induced effect



**HU – Hungary**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	243	0,20%	Direct Effect	20 042	0,43%
Total Effect*	342	0,28%	Total Effect*	24 375	0,52%
Multiplier	1,41		Multiplier	1,22	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 151	0,93%	Direct Effect	55 617	1,18%
Total Effect*	1 724	1,39%	Total Effect*	79 496	1,69%
Multiplier	1,50		Multiplier	1,43	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 651	2,14%	Direct Effect	149 636	3,17%
Total Effect*	3 970	3,21%	Total Effect*	205 560	4,36%
Multiplier	1,50		Multiplier	1,37	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 672	2,97%	Direct Effect	169 535	3,60%
Total Effect*	5 426	4,39%	Total Effect*	244 037	5,18%
Multiplier	1,48		Multiplier	1,44	

Total Effect\*: direct, indirect (domestic)+ induced effect

**IE – Ireland**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	121	0,04%	Direct Effect	2 017	0,09%
Total Effect*	277	0,08%	Total Effect*	4 361	0,19%
Multiplier	2,28		Multiplier	2,16	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	699	0,21%	Direct Effect	7 319	0,32%
Total Effect*	1 225	0,37%	Total Effect*	13 731	0,59%
Multiplier	1,75		Multiplier	1,88	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	15 681	4,68%	Direct Effect	55 159	2,38%
Total Effect*	21 020	6,27%	Total Effect*	107 858	4,65%
Multiplier	1,34		Multiplier	1,96	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	17 301	5,16%	Direct Effect	59 330	2,56%
Total Effect*	23 296	6,95%	Total Effect*	118 692	5,12%
Multiplier	1,35		Multiplier	2,00	

Total Effect\*: direct, indirect (domestic)+ induced effect

**IT – Italy**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 159	0,13%	Direct Effect	38 548	0,15%
Total Effect*	2 430	0,15%	Total Effect*	43 047	0,17%
Multiplier	1,13		Multiplier	1,12	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	12 605	0,78%	Direct Effect	218 416	0,86%
Total Effect*	24 714	1,53%	Total Effect*	398 110	1,56%
Multiplier	1,96		Multiplier	1,82	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	33 591	2,08%	Direct Effect	577 178	2,26%
Total Effect*	68 247	4,24%	Total Effect*	1 112 978	4,36%
Multiplier	2,03		Multiplier	1,93	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	49 174	3,05%	Direct Effect	718 415	2,82%
Total Effect*	96 705	6,00%	Total Effect*	1 450 076	5,69%
Multiplier	1,97		Multiplier	2,02	

Total Effect\*: direct, indirect (domestic)+ induced effect

**LT – Lithuania**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	213	0,48%	Direct Effect	11 955	0,86%
Total Effect*	312	0,71%	Total Effect*	14 691	1,06%
Multiplier	1,46		Multiplier	1,23	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	933	2,12%	Direct Effect	38 443	2,77%
Total Effect*	1 476	3,36%	Total Effect*	53 470	3,85%
Multiplier	1,58		Multiplier	1,39	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 104	4,79%	Direct Effect	79 898	5,75%
Total Effect*	3 205	7,30%	Total Effect*	111 131	8,00%
Multiplier	1,52		Multiplier	1,39	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 325	7,57%	Direct Effect	91 746	6,61%
Total Effect*	4 913	11,19%	Total Effect*	136 390	9,82%
Multiplier	1,48		Multiplier	1,49	

Total Effect\*: direct, indirect (domestic)+ induced effect

**LU – Luxembourg**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	6	0,01%	Direct Effect	322	0,07%
Total Effect*	9	0,02%	Total Effect*	365	0,08%
Multiplier	1,54		Multiplier	1,13	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	311	0,55%	Direct Effect	2 436	0,53%
Total Effect*	436	0,77%	Total Effect*	3 434	0,74%
Multiplier	1,40		Multiplier	1,41	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	873	1,53%	Direct Effect	9 742	2,10%
Total Effect*	1 289	2,26%	Total Effect*	13 675	2,95%
Multiplier	1,48		Multiplier	1,40	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 166	2,05%	Direct Effect	11 593	2,50%
Total Effect*	1 705	3,00%	Total Effect*	16 763	3,62%
Multiplier	1,46		Multiplier	1,45	

Total Effect\*: direct, indirect (domestic)+ induced effect

**LV – Latvia**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	557	2,09%	Direct Effect	18 200	2,03%
Total Effect*	742	2,78%	Total Effect*	24 770	2,76%
Multiplier	1,33		Multiplier	1,36	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 345	5,04%	Direct Effect	41 968	4,67%
Total Effect*	2 017	7,55%	Total Effect*	65 453	7,29%
Multiplier	1,50		Multiplier	1,56	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 787	6,70%	Direct Effect	64 507	7,18%
Total Effect*	2 872	10,76%	Total Effect*	103 414	11,51%
Multiplier	1,61		Multiplier	1,60	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 007	11,27%	Direct Effect	81 719	9,10%
Total Effect*	4 792	17,95%	Total Effect*	143 766	16,01%
Multiplier	1,59		Multiplier	1,76	

Total Effect\*: direct, indirect (domestic)+ induced effect

**MT – Malta**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	0	0,00%	Direct Effect	0	0,00%
Total Effect*	0	0,00%	Total Effect*	0	0,00%
Multiplier	0,00		Multiplier	0,00	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	15	0,12%	Direct Effect	370	0,15%
Total Effect*	22	0,18%	Total Effect*	554	0,22%
Multiplier	1,54		Multiplier	1,50	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	267	2,13%	Direct Effect	6 254	2,49%
Total Effect*	373	2,98%	Total Effect*	8 929	3,55%
Multiplier	1,40		Multiplier	1,43	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	358	2,85%	Direct Effect	6 579	2,61%
Total Effect*	500	3,99%	Total Effect*	10 149	4,03%
Multiplier	1,40		Multiplier	1,54	

Total Effect\*: direct, indirect (domestic)+ induced effect

**NL – The Netherlands**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	112	0,02%	Direct Effect	1 949	0,02%
Total Effect*	164	0,02%	Total Effect*	2 624	0,03%
Multiplier	1,46		Multiplier	1,35	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 234	0,45%	Direct Effect	34 111	0,35%
Total Effect*	5 915	0,82%	Total Effect*	69 726	0,72%
Multiplier	1,83		Multiplier	2,04	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	15 502	2,14%	Direct Effect	175 186	1,82%
Total Effect*	28 785	3,97%	Total Effect*	367 089	3,82%
Multiplier	1,86		Multiplier	2,10	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	25 699	3,54%	Direct Effect	215 271	2,24%
Total Effect*	44 600	6,15%	Total Effect*	490 217	5,09%
Multiplier	1,74		Multiplier	2,28	

Total Effect\*: direct, indirect (domestic)+ induced effect



**NO – Norway**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	653	0,20%	Direct Effect	6 978	0,25%
Total Effect*	863	0,27%	Total Effect*	9 036	0,32%
Multiplier	1,32		Multiplier	1,29	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 729	0,54%	Direct Effect	22 960	0,81%
Total Effect*	3 431	1,07%	Total Effect*	39 084	1,38%
Multiplier	1,98		Multiplier	1,70	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	11 165	3,47%	Direct Effect	129 256	4,55%
Total Effect*	25 013	7,77%	Total Effect*	273 577	9,63%
Multiplier	2,24		Multiplier	2,12	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	12 457	3,87%	Direct Effect	136 692	4,81%
Total Effect*	27 082	8,42%	Total Effect*	288 626	10,16%
Multiplier	2,17		Multiplier	2,11	

Total Effect\*: direct, indirect (domestic)+ induced effect

**PL – Poland**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 457	0,31%	Direct Effect	60 460	0,37%
Total Effect*	2 138	0,46%	Total Effect*	82 799	0,50%
Multiplier	1,47		Multiplier	1,37	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	8 110	1,73%	Direct Effect	305 546	1,86%
Total Effect*	15 043	3,21%	Total Effect*	513 017	3,13%
Multiplier	1,85		Multiplier	1,68	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	17 788	3,79%	Direct Effect	735 806	4,49%
Total Effect*	34 008	7,25%	Total Effect*	1 227 047	7,48%
Multiplier	1,91		Multiplier	1,67	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	25 047	5,34%	Direct Effect	879 670	5,36%
Total Effect*	45 795	9,76%	Total Effect*	1 510 631	9,21%
Multiplier	1,83		Multiplier	1,72	

Total Effect\*: direct, indirect (domestic)+ induced effect

**PT – Portugal**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	701	0,38%	Direct Effect	12 227	0,25%
Total Effect*	835	0,45%	Total Effect*	15 995	0,32%
Multiplier	1,19		Multiplier	1,31	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 738	1,48%	Direct Effect	57 198	1,15%
Total Effect*	4 536	2,44%	Total Effect*	101 059	2,04%
Multiplier	1,66		Multiplier	1,77	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	4 778	2,58%	Direct Effect	138 720	2,80%
Total Effect*	7 977	4,30%	Total Effect*	221 085	4,46%
Multiplier	1,67		Multiplier	1,59	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	7 512	4,05%	Direct Effect	201 900	4,08%
Total Effect*	12 006	6,47%	Total Effect*	322 276	6,51%
Multiplier	1,60		Multiplier	1,60	

Total Effect\*: direct, indirect (domestic)+ induced effect

**RO – Romania**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	773	0,38%	Direct Effect	56 766	0,66%
Total Effect*	1 283	0,64%	Total Effect*	77 925	0,90%
Multiplier	1,66		Multiplier	1,37	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 179	1,08%	Direct Effect	141 164	1,63%
Total Effect*	4 310	2,14%	Total Effect*	220 421	2,55%
Multiplier	1,98		Multiplier	1,56	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	5 919	2,93%	Direct Effect	333 803	3,86%
Total Effect*	11 120	5,51%	Total Effect*	524 667	6,07%
Multiplier	1,88		Multiplier	1,57	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	8 034	3,98%	Direct Effect	403 568	4,67%
Total Effect*	14 544	7,21%	Total Effect*	645 925	7,47%
Multiplier	1,81		Multiplier	1,60	

Total Effect\*: direct, indirect (domestic)+ induced effect

**SE – Sweden**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 605	0,85%	Direct Effect	40 625	0,80%
Total Effect*	6 296	1,49%	Total Effect*	73 570	1,45%
Multiplier	1,75		Multiplier	1,81	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	9 148	2,16%	Direct Effect	99 278	1,96%
Total Effect*	17 803	4,20%	Total Effect*	197 460	3,90%
Multiplier	1,95		Multiplier	1,99	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	15 492	3,66%	Direct Effect	178 657	3,53%
Total Effect*	29 881	7,06%	Total Effect*	341 381	6,75%
Multiplier	1,93		Multiplier	1,91	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	24 248	5,73%	Direct Effect	212 442	4,20%
Total Effect*	43 374	10,24%	Total Effect*	429 606	8,49%
Multiplier	1,79		Multiplier	2,02	

Total Effect\*: direct, indirect (domestic)+ induced effect

**SI – Slovenia**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	299	0,71%	Direct Effect	7 259	0,69%
Total Effect*	344	0,81%	Total Effect*	8 369	0,80%
Multiplier	1,15		Multiplier	1,15	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	756	1,79%	Direct Effect	20 977	2,01%
Total Effect*	1 073	2,53%	Total Effect*	28 928	2,77%
Multiplier	1,42		Multiplier	1,38	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 548	3,66%	Direct Effect	42 948	4,11%
Total Effect*	2 406	5,68%	Total Effect*	64 942	6,21%
Multiplier	1,55		Multiplier	1,51	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 248	5,31%	Direct Effect	52 360	5,01%
Total Effect*	3 465	8,19%	Total Effect*	83 477	7,98%
Multiplier	1,54		Multiplier	1,59	

Total Effect\*: direct, indirect (domestic)+ induced effect

**SK – Slovakia**

<b>Forestry</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	570	0,68%	Direct Effect	25 629	1,05%
Total Effect*	682	0,81%	Total Effect*	29 302	1,20%
Multiplier	1,19		Multiplier	1,14	

<b>Wood industry in the narrowest sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	1 448	1,72%	Direct Effect	62 363	2,55%
Total Effect*	2 087	2,48%	Total Effect*	83 423	3,41%
Multiplier	1,44		Multiplier	1,34	

<b>Wood industry in the narrow sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	2 662	3,17%	Direct Effect	104 685	4,28%
Total Effect*	4 310	5,13%	Total Effect*	157 008	6,42%
Multiplier	1,62		Multiplier	1,50	

<b>Wood industry in the broad sense</b>					
<b>Gross Value Added</b>			<b>Employment</b>		
	<b>Million €</b>	<b>% of national GVA</b>		<b>Persons</b>	<b>% of national employment</b>
Direct Effect	3 549	4,22%	Direct Effect	118 672	4,85%
Total Effect*	5 703	6,79%	Total Effect*	187 680	7,68%
Multiplier	1,61		Multiplier	1,58	

Total Effect\*: direct, indirect (domestic)+ induced effect

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## **The Economic Impact of the Forestry and Wood Industry in Europe in terms of the Bioeconomy**

Report

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