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(OECD)**

### **AGRICULTURAL PRODUCTIVITY IN THE EU**

Invited paper submitted by Eurostat\*

**Summary:** Eurostat is currently developing agricultural productivity indicators for the Member States of the European Union as a response to the Common Agricultural Policy reform "Agenda 2000" and in anticipation of greater interest from policy makers and analysts alike. The revised Economic Accounts for Agriculture (EAA '97<sup>1</sup>) and its coherent counterpart, Agricultural Labour Input (ALI) statistics, provide a harmonised framework within which timely data can be used for the construction of productivity indicators. Indeed, the reason that a new Chapter on agricultural productivity makes sense in this report is because the Income Indicators that are constructed from the EAA and ALI and analysed in this report are themselves a form of productivity indicator that measures the health of the agricultural industry in the European Union.

Discussions with Member States have pointed towards concentration on two agricultural productivity indicators, although the final form of these is still being researched and depends to a large degree on the availability of data. Further progress is needed towards a final form of these productivity indicators in the year

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\* Prepared by Mr. Edward Cook, Eurostat.  
ahead so that more robust derived productivity data and more concise analyses can be presented in the next income report. In the interim, Eurostat considers that there is a need for putting forward the work that

is in development, the basic data and the **partial and provisional** derived productivity data in order to further improve discussions.

### ***Frequently Asked Questions (FAQs)***

*What is “productivity”?* Productivity indicators are ratios of measures of output to measures of input. In the case of the agricultural productivity indicators being developed by Eurostat, these measures relate to the agricultural industry.

*What is the relationship between “output” and “inputs”?* Output is viewed as a function of quantities of four types of input - capital, labour, land and raw materials - given existing technical knowledge<sup>2</sup>.

## **BACKGROUND**

1. Since the founding of the Common Agricultural Policy (CAP) in the Treaty of Rome, the link between productivity and income has been emphasised. Article 39 of the Treaty regarding the CAP states as its first two objectives :
  - a) to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of factors of production, in particular labour;
  - b) thus to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture.
2. Over time, the CAP has adapted to meet new challenges. Most recently, Agenda 2000 has widened and deepened the reforms introduced in 1992. The internal and external challenges of enlargement, WTO negotiations (affecting domestic support, market access and export subsidies) and EU budget costs among others, mean that if the European Union is to thrive in more open world markets, then greater attention will have to be made at ensuring the competitiveness of the agricultural industry.
3. Eurostat responded to this latest challenge by starting discussions with the Member States in March 2000 about what agricultural productivity measures could be provided for analytical purposes to all manner of users from the data available. These discussions have since been supported and guided by the July 2000 draft of the OECD’s “Manual on Productivity Measurement : a guide to the measurement of industry-level and aggregate productivity growth”, which has subsequently been revised and is near publication.

## **OBJECTIVES**

4. The objectives of Eurostat’s agricultural productivity indicators are shaped by the context of the CAP (as described above) and the availability of detailed harmonised data for the Member States. Eurostat’s initial general objectives for agricultural productivity indicators are to measure and compare rates of *growth* in agricultural productivity between Member States rather than to measure and

compare *levels* of agricultural productivity between Member States, although this may be explored at a subsequent stage.

5. Whilst the income indicators could be viewed as a type of productivity indicator that monitors the health of the agricultural industry in the European Union, bearing in mind that care must be taken not to equate this with the standard of living of farmers<sup>3</sup>, the growth approach pursued will also allow performance comparisons of the agricultural industries of all Member States as well as performance comparisons across different industries of each Member States' economy. These objectives are the chosen focus of Eurostat's development of the agricultural productivity indicators although this does not preclude there being other uses.<sup>4</sup>

## **TYPES OF PRODUCTIVITY MEASURES**

6. Productivity measures fall into one of either two main types;

- (1) Partial productivity : that relates all of a measure of output to a single measure of input.
- (2) Multi-factor productivity : that relates all of a measure of output to a bundle of inputs<sup>5</sup>.

7. Both of these broad categories of productivity indicator have advantages and disadvantages. In short, the advantages of the partial productivity approach are its ease of measurement and readability (once the subject coverage, in this case the definition of the agricultural industry, are applied to both data sets). Its disadvantage is that, in reality, output is a function of the developments in a number of factor inputs that work together and inter-relate. Conversely, the multi-factor approach combines a number of inputs and relates these to the development in output, but has the drawback that it places strong demands on data availability.

8. A preference for and main focus on a multi-factor agricultural productivity approach that allows performance comparisons of the agricultural industries of all Member States to be made has been determined. A partial labour productivity indicator for industry comparisons within a Member State would also be explored but would not be the principal measure. It was thought that focus on a partial labour productivity measure (in an industry that is highly labour intensive) could be misleading because other inputs have been changing at varying rates over time and certain work activities performed by the industry have also changed over time.

9. The two measures of agricultural productivity that are being developed by Eurostat are presented below:

### **Multi-factor productivity indicator being researched :**

10. The Member States are agreed that the productivity measures that Eurostat adopts should concentrate on **volume** (constant price) measures of output and input. These measures should be based on the revised Economic Accounts for Agriculture (EAA) and revised Agricultural Labour Input (ALI) frameworks.

“**Output**” corresponds to the volume (constant prices, 1995=100) of the output of the agricultural industry (a total output approach) in basic prices<sup>6</sup>. The figures are calculated in euros.

“**Input**” refers to the bundle of the volume (constant prices, 1995=100) of a unit input of capital (weighted by current euro prices of the consumption of fixed capital), raw materials (weighted by current euro prices of intermediate consumption) and labour (salaried labour input being weighted by the compensation of employees in current prices and non-salaried labour input by the average compensation per employee<sup>7</sup>).

**Caution:** There are a number of elements about this measure that need to be alluded to:

- “**Output**” only refers to a physical output, but there are social (particularly desertification) and environmental issues / policy goals that are not measured.
- “The consumption of fixed capital” is used as the weight for capital but may need reviewing empirically.
- “**Labour input**” figures used here are not broken down by demographics into age, gender, level of education among others<sup>8</sup>. Definitions of the units measuring labour input that are currently being used vary widely between the Member States (the number of hours defining full-time work varying between 1739 hours per person per year in Denmark to 2218 hours per family member per year in Germany) and apply a constraint so that no one working over the definition of full-time can be counted as more than one full-time equivalent worker<sup>9</sup>.

11. Data constraints and the importance of carrying out empirical research will determine how far these cautionary notes can be tackled and the resulting multi-factor indicator modified.

#### **Partial labour productivity indicator being researched:**

12. A partial productivity indicator for industry comparisons within a Member State, based on “**volume**” figures from the revised EAA and ALI frameworks, is also being pursued as a secondary measure.

“**Output**” corresponds to the volume of Gross Value Added at basic prices.

“**Input**” refers to the volume of agricultural labour as measured in Annual Work Units.

**Caution:** As for the “multi-factor indicator”, there are some elements that require further research.

#### **AGRICULTURAL PRODUCTIVITY IN THE EU**

13. For policy makers and analysts alike the need for coherent and harmonised long-term productivity series is paramount. On the one hand, Eurostat and Member States will continue discussions on the final form of the productivity indicators, **building on the provisional situation presented here**. On the other, Member States will be working on their commitment to provide Eurostat with the background long-term series for the revised Economic Accounts for Agriculture (EAA) and Agricultural Labour Input (ALI) statistics. In the current period of implementation of these revised manuals of methodology there are considerable gaps in the data provided that mean that the **provisional productivity measures** are incomplete in many cases.

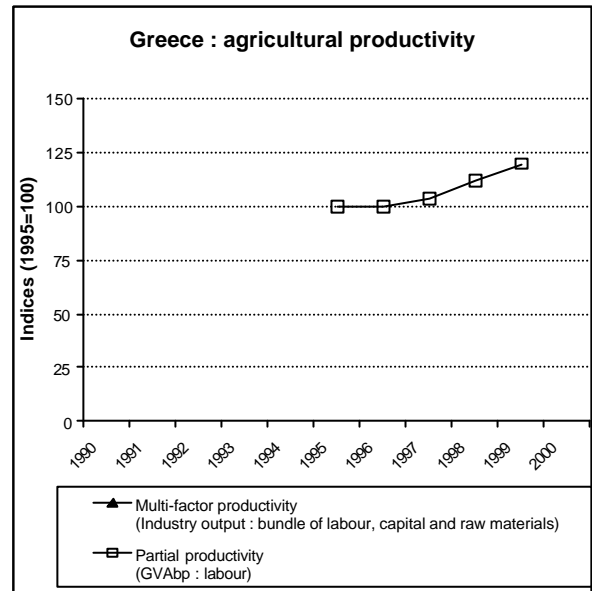
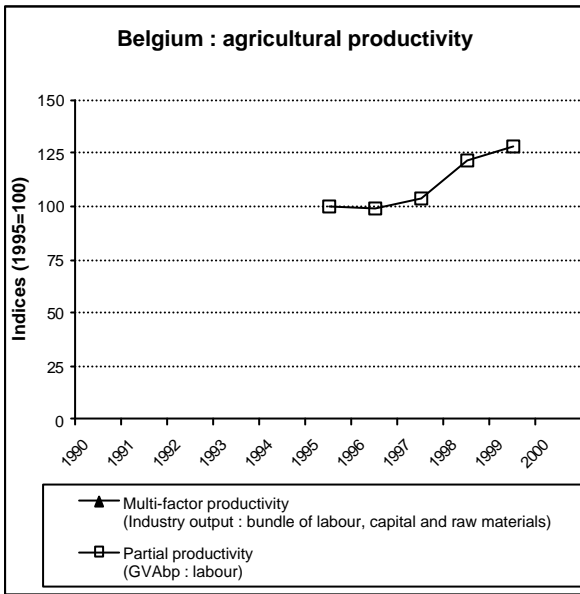
14. Nevertheless, preliminary and incomplete productivity indicators can be calculated for all of the Member States. Below, a series of graphics highlight the existing productivity time series that can be calculated for the two measures chosen on a Member State by Member State basis. The corresponding productivity data, together with the background volume indices for the outputs and inputs covered as well as the weights derived are available in Annex II of this report.

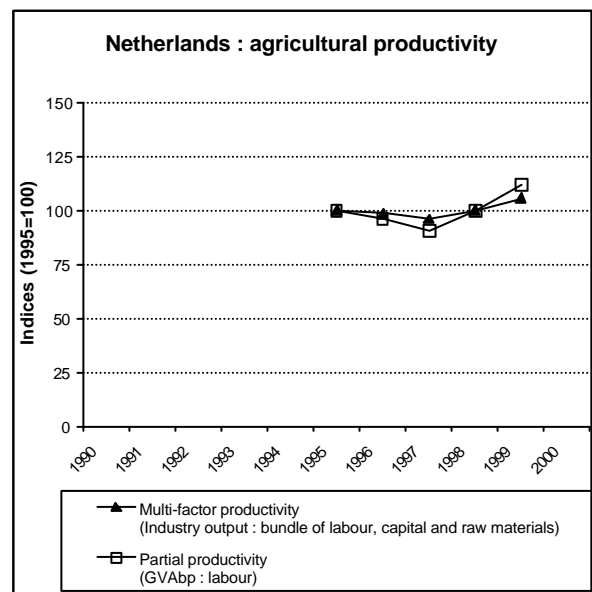
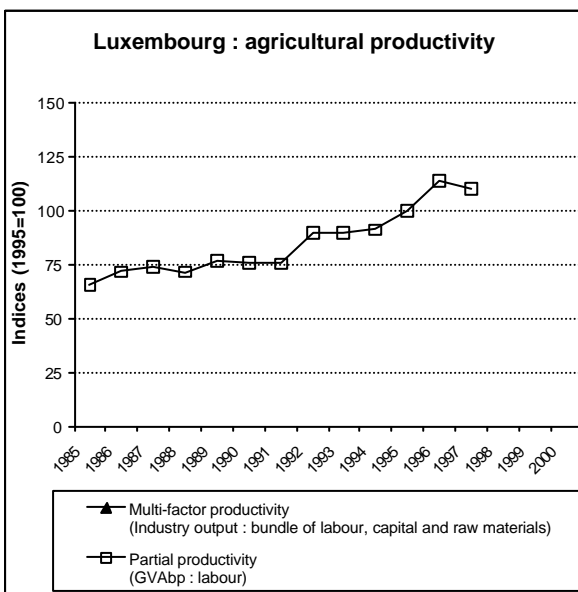
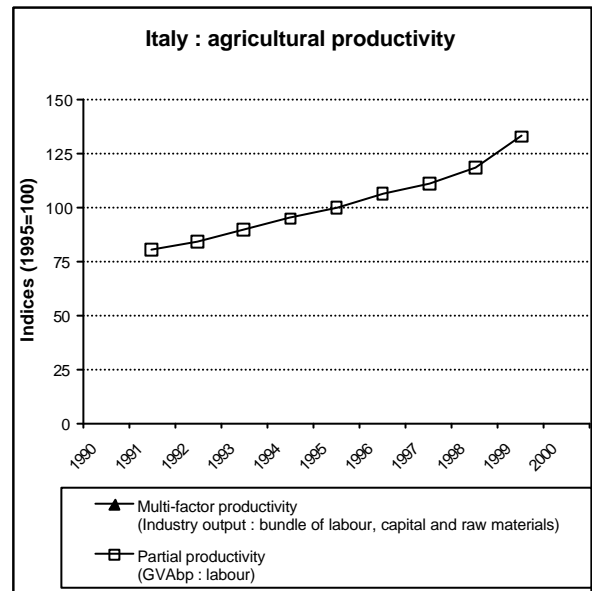
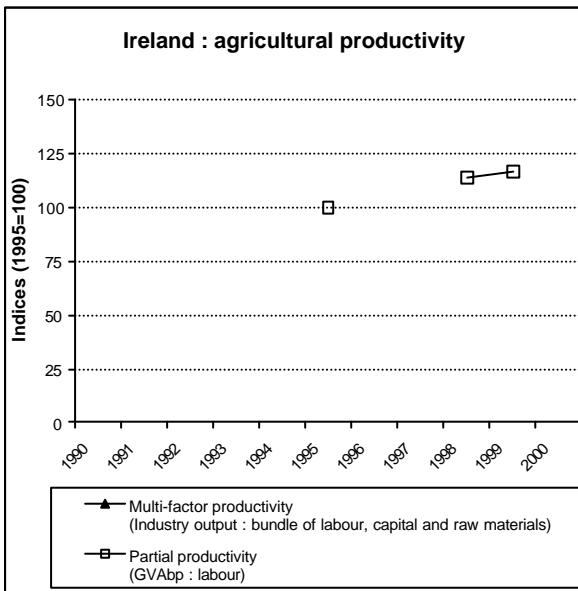
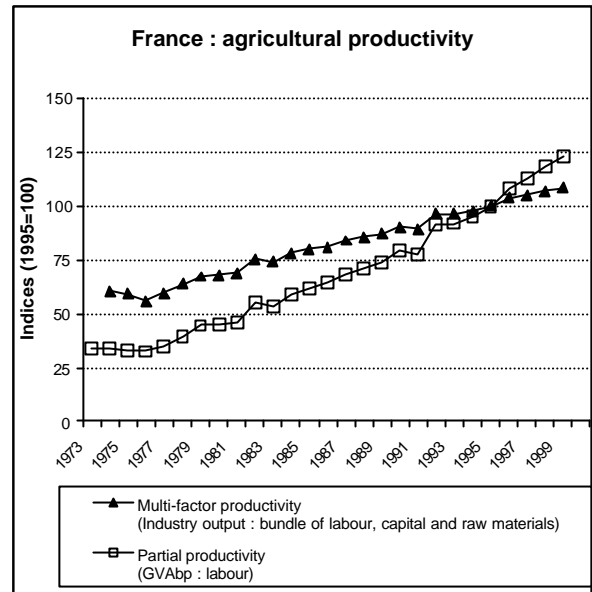
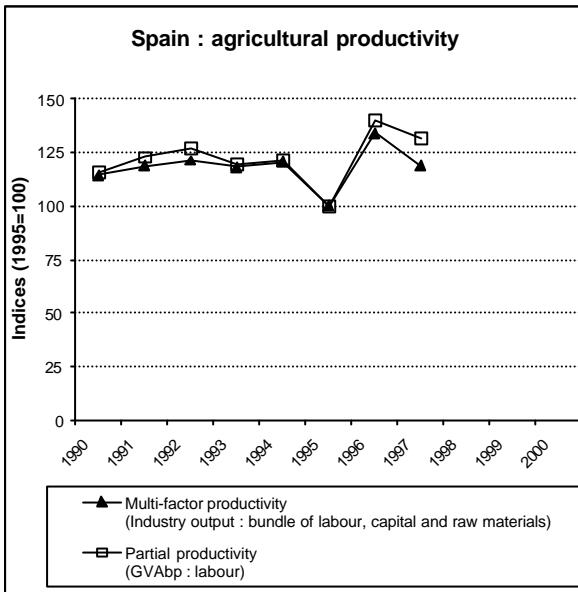
15. Analyses of the provisional productivity indicators generated can only be of a highly limited nature for the moment because of the incomplete nature of the data sets thus far supplied by the Member States and the fact that the weights being used are in development. It is intended, however, that these productivity measures will be available for all Member States during the course of 2001 and that in-depth analyses will subsequently be provided by Eurostat.

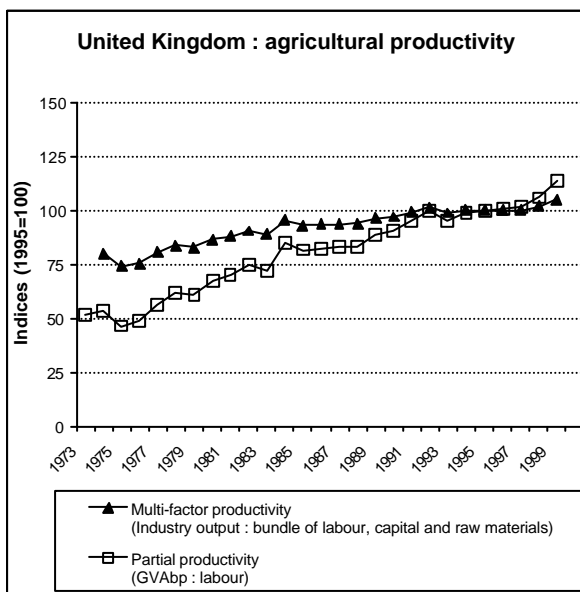
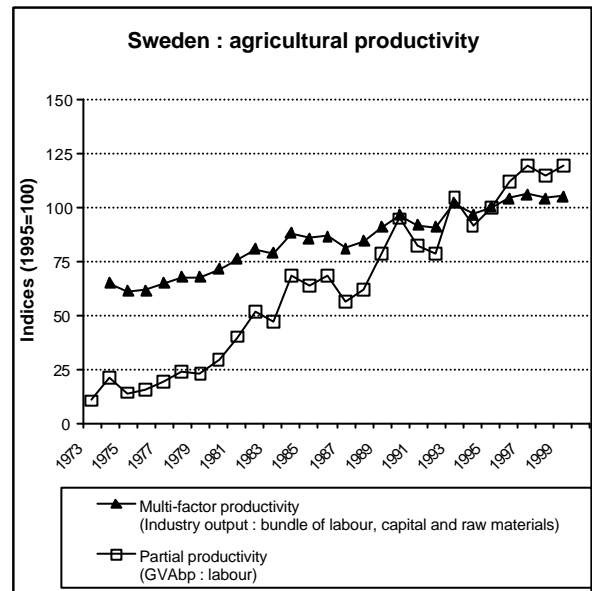
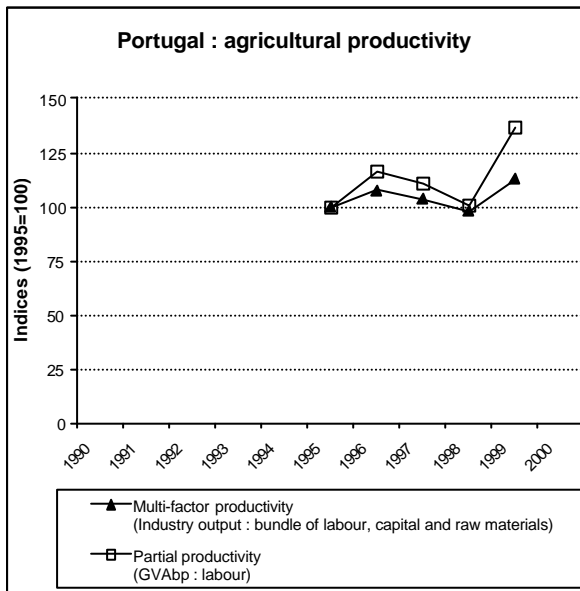
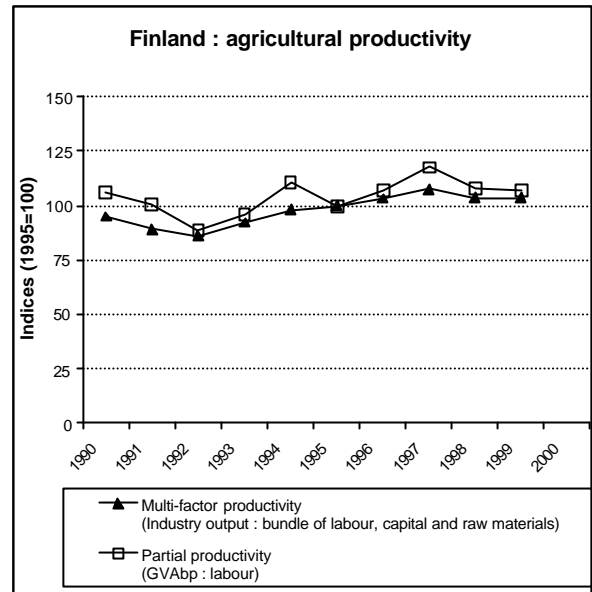
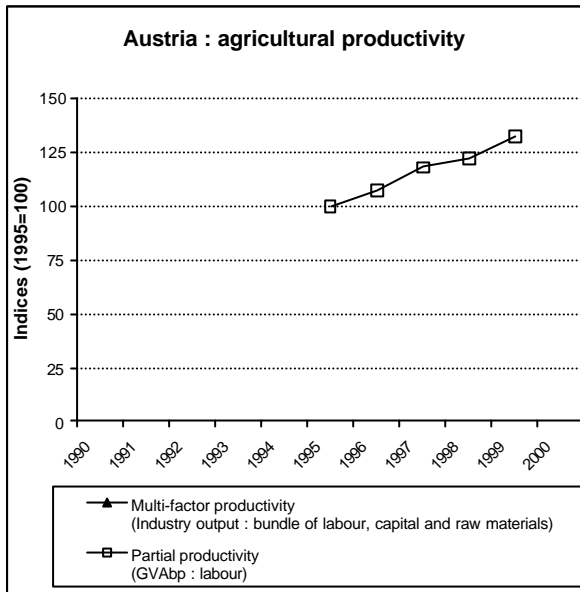
16. Nevertheless, there are some important points for users to bear in mind and some general information about the productivity indicators that can be made. It should be remembered that there are varied structures of agriculture in the Member States. Some types of agricultural production (orchard, vineyard and olive grove production) are more labour intensive than others. Additionally, some technological developments are not applicable or of varying applicability in Member States, perhaps because of climatic, soil or topographical conditions.

17. The partial agricultural productivity indicators illustrate that there have been widespread and marked improvements during the period under review. For most Member States there has been expanding agricultural industry output (the exceptions being for Finland and to some degree Sweden) at the same time as marked and continuous reductions in the volume of agricultural labour. Although direct comparisons between Member States should be treated with caution for the reasons expressed above, it can be concluded that the differences between the rates of productivity gain may be very substantial.

18. In some Member States there are marked fluctuations in the productivity indicators between years. In general, such changes reflect either climatic influences on crop output and input volumes or outbreaks of animal diseases. For example, the strong downward turns in the productivity indicators for Spain in 1995 largely reflect the influences of the worsening drought in that year both on output and input. The volume of agricultural output as a whole declined due to the effects of the drought in reducing the cereal harvest output. The decline in cereals output meant that many farmers could not produce enough on-farm animal feed for their strongly expanding cattle and pig production. Instead, feed had to be bought from off the farm, resulting









in a much higher volume<sup>10</sup> of animal feed purchased. In the case of the Netherlands, the downturn in the productivity indicators in 1997 reflected the impact of the swine fever crisis; the volume of pig output declined by about 35% on 1996 levels as millions of pigs were removed from food chain.

19. The steady and considerable decline in the number of agricultural workers<sup>11</sup> can be linked to both push and pull factors. On the one hand, the number of farms has declined sharply over the years leading to the loss of agricultural labour, and technological changes have seen the substitution of manual labour with machinery. On the other, there may have been relatively brighter economic prospects for the agricultural workforce in other sectors of the economy as personal expectations, environments and requirements have changed (this may be the case, in particular, for farmers' wives and daughters).

20. The composition of the remaining workforce has also changed with many Member States recording increasing proportions of hired workers. Despite considerable variations in seasonal hired labour for perishable crops, there are some features of the upward trend in hired labour that can be identified. Many farms, particularly small ones, are increasingly using hired labour on a contract basis for specialist tasks, rather than investing in new technological or replacement machinery. There are also a number of farms that are established on a legal basis. Such farms, often with directors at the helm do not fit the traditional family farm mould and the labour input employed on the farm is considered as salaried labour input.

21. As farmers retire (often encouraged into early retirement by specific policies that encourage a younger generation to take over) or leave agriculture, the industry make-up is changing to that of a smaller number of bigger, often specialising farms, engaging ever smaller amounts of labour input per holding.



Table B.3

**Volume indices of Consumption of fixed Capital, from 1990 to 2000  
(1995=100)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	:	:	:	:	:	:	:
DK	107.1	103.7	102.7	101.5	100.4	100.0	99.6	99.2	97.6	96.8	96.8	0.0
D	:	:	:	:	:	:	:	:	:	:	:	:
EL	:	:	:	:	:	:	:	:	:	:	:	:
E	95.9	96.4	97.1	97.4	98.3	100.0	101.2	102.3	:	:	:	:
F	105.5	104.9	103.6	101.9	100.6	100.0	100.2	100.9	101.7	103.2	104.4	1.2
IRL	:	:	:	:	:	:	:	:	:	:	:	:
I	:	:	:	:	:	:	:	:	:	:	:	:
L	:	:	:	:	:	:	:	:	:	:	:	:
NL	:	:	:	:	:	100.0	98.9	97.9	98.1	90.8	91.7	1.0
A	:	:	:	:	:	:	:	:	:	:	:	:
P	:	:	:	:	:	100.0	104.3	110.3	117.6	127.7	139.8	9.5
FIN	121.0	119.9	116.0	110.6	105.0	100.0	95.7	92.3	90.3	89.2	87.4	-2.0
S	123.8	117.7	112.6	106.9	102.8	100.0	97.8	97.2	90.1	89.2	88.5	-0.7
UK	101.9	100.9	99.8	99.2	99.5	100.0	100.8	100.8	99.6	97.8	111.5	14.0
EUR12	:	:	:	:	:	:	:	:	:	:	:	:
EU-15	:	:	:	:	:	:	:	:	:	:	:	:

Table B.4

**Volume indices of total agricultural labour, from 1990 to 2000**

(1995=100)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	115.0	112.3	107.4	104.5	101.9	100.0	95.2	94.8	91.8	90.1	88.1	-2.3
DK	116.7	112.7	110.4	109.4	104.4	100.0	97.6	95.0	90.4	86.0	83.4	-3.0
D	:	143.6	120.7	112.5	105.3	100.0	96.2	93.5	90.0	88.6	87.3	-1.6
EL	115.8	106.6	108.1	109.8	104.8	100.0	96.9	93.8	90.7	87.7	84.8	-3.3
E	101.1	95.6	93.2	102.2	101.1	100.0	100.1	101.0	102.2	97.0	91.9	-5.3
F	121.4	116.5	111.6	105.9	102.6	100.0	97.6	95.2	93.2	91.6	89.9	-1.8
IRL	126.7	113.2	112.0	108.8	105.4	100.0	100.2	92.5	90.2	82.7	80.3	-2.9
I	:	123.0	119.2	109.1	104.0	100.0	95.4	92.7	88.7	83.2	81.2	-2.4
L	120.8	117.1	112.2	109.4	104.3	100.0	96.2	93.5	92.1	90.2	88.2	-2.2
NL	102.2	105.0	106.1	104.8	102.0	100.0	102.1	102.4	100.6	96.4	96.1	-0.2
A	133.6	128.3	120.3	112.8	106.2	100.0	95.1	92.3	90.3	88.3	86.4	-2.2
P	133.0	123.0	112.9	102.9	100.9	100.0	94.6	89.2	86.8	84.6	82.3	-2.7
FIN	119.3	115.9	114.2	109.3	104.6	100.0	97.9	95.6	90.9	86.4	82.1	-5.0
S	110.6	107.2	105.3	104.8	103.2	100.0	96.6	93.3	89.0	84.7	81.2	-4.1
UK	110.0	107.9	105.9	104.6	102.3	100.0	98.2	97.2	95.7	92.3	86.7	-6.1
EUR12	:	116.8	111.1	107.1	103.2	100.0	97.2	94.8	92.5	88.9	86.4	-2.8
EU-15	:	116.1	110.7	107.0	103.2	100.0	97.2	94.9	92.6	89.0	86.3	-3.0

Table B.5

**Volume indices of agricultural intermediate consumption, from 1990 to 2000  
(1995=100)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	100.0	93.8	93.3	95.9	94.4	93.9	-0.6
DK	103.9	101.6	100.9	102.4	100.3	100.0	100.8	103.5	104.2	102.1	101.9	-0.2
D	:	102.3	97.5	98.9	105.2	100.0	99.8	101.8	108.5	103.0	99.6	-3.3
EL	:	:	:	:	:	100.0	101.5	101.0	103.7	101.6	101.0	-0.6
E	78.2	75.0	72.6	74.0	67.6	100.0	72.3	103.7	:	:	:	:
F	96.8	99.0	100.2	97.4	98.3	100.0	101.4	102.8	104.6	106.5	106.7	0.2
IRL	:	:	:	:	:	100.0	:	:	106.3	108.8	109.1	0.3
I	107.8	110.0	107.1	103.6	100.7	100.0	99.0	96.8	96.8	95.9	94.8	-1.1
L	105.5	101.0	108.3	101.6	99.7	100.0	100.5	97.3	:	:	:	:
NL	:	:	:	:	:	100.0	100.7	100.6	100.9	101.8	100.8	-1.0
A	:	:	:	:	:	100.0	101.6	99.7	101.8	100.9	99.6	-1.4
P	:	:	:	:	:	100.0	104.0	101.4	102.8	113.6	110.1	-3.0
FIN	96.5	86.5	87.6	91.2	86.1	100.0	98.6	98.1	96.6	100.6	101.7	1.1
S	110.8	100.7	95.8	95.5	99.7	100.0	102.2	101.9	106.3	103.8	103.0	-0.8
UK	94.6	94.7	95.1	95.5	98.3	100.0	100.5	101.0	100.1	99.4	97.1	-2.3
EUR12	:	:	:	:	:	:	:	:	:	:	:	:
EU-15	:	:	:	:	:	:	:	:	:	:	:	:

Table B.6

**Consumption of fixed capital, from 1990 to 2000  
in current prices and Mio Ecu/Euro**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	618.0	571.1	607.6	614.3	606.2	597.2	-1.5
DK	841.0	828.1	840.2	868.3	868.5	913.4	923.6	924.5	926.5	934.4	917.2	-1.8
D	:	6393.8	6847.7	7228.9	7258.1	7537.8	7422.5	7183.1	7122.3	7147.9	7212.5	0.9
EL	:	:	:	:	:	611.5	641.4	652.1	642.9	647.3	648.5	0.2
E	2523.5	2599.1	2460.8	2221.3	2209.5	2324.3	2479.3	2525.6	2501.4	2581.3	2496.6	-3.3
F	6611.0	6783.4	6950.4	7057.9	7127.9	7113.7	7254.4	7254.6	7391.0	7661.3	7752.5	1.2
IRL	:	:	:	:	:	476.4	:	:	568.0	578.5	604.8	4.6
I	6283.3	6792.8	6861.1	6169.8	6167.4	5799.2	6581.0	6877.6	7006.9	7210.3	7253.7	0.6
L	28.3	32.9	34.6	36.0	37.8	38.5	37.9	37.0	38.1	53.4	50.4	-5.7
NL	:	:	:	:	:	2286.9	2253.6	2194.7	2223.8	2103.7	2116.5	0.6
A	:	:	:	:	:	1272.2	1255.7	1231.1	1242.0	1246.2	1225.5	-1.7
P	:	:	:	:	:	712.7	707.2	703.7	703.6	729.8	741.4	1.6
FIN	1181.3	1132.3	947.1	817.0	865.8	786.4	742.8	717.3	705.9	715.8	694.1	-3.0
S	780.1	790.7	761.3	632.6	636.3	644.7	699.6	690.5	628.9	633.9	621.2	-2.0
UK	2455.7	2473.1	2274.0	2191.8	2269.9	2256.6	2318.5	2722.5	2750.2	2774.7	2642.7	-4.8
EUR12	:	:	:	:	:	29577.3	:	:	30760.1	31281.8	31791.9	1.6
EU-15	:	:	:	:	:	33391.9	:	:	35065.6	35624.8	36071.0	1.3

Table B.7

**Compensation of employees, from 1990 to 2000  
in current prices and Mio Ecu/Euro**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	267.5	265.5	260.8	271.7	279.1	293.1	5.0
DK	445.7	436.0	467.1	463.3	458.7	493.9	511.5	541.6	538.3	525.4	520.2	-1.0
D	:	5757.3	4301.2	4353.5	4240.3	4455.1	4031.1	3576.9	3601.3	3648.9	3706.9	1.6
EL	:	:	:	:	:	455.7	479.4	497.8	470.3	477.4	490.4	2.7
E	2527.1	2727.3	2526.4	2200.5	2181.4	2187.5	2276.0	2602.1	2766.9	2788.1	2823.0	1.3
F	3866.9	3928.8	4130.6	4373.4	4371.7	4593.2	4665.3	4700.0	4878.1	5064.4	5189.8	2.5
IRL	:	:	:	:	:	264.6	:	:	255.3	253.7	251.3	-1.0
I	8737.8	8834.6	9344.7	7797.2	7106.6	6347.1	6604.8	6653.6	6442.7	6265.1	6321.4	0.9
L	4.2	4.7	5.2	5.9	6.1	6.7	7.3	6.5	6.7	10.3	10.4	1.3
NL	:	:	:	:	:	1550.8	1593.2	1610.7	1708.1	1768.4	1910.4	8.0
A	:	:	:	:	:	94.5	94.8	99.7	93.0	107.4	110.6	3.0
P	:	:	:	:	:	514.3	503.5	523.8	534.6	559.7	582.5	4.1
FIN	538.8	557.0	475.3	376.9	381.7	433.9	391.6	376.2	381.1	423.8	442.0	4.3
S	286.6	278.7	241.9	214.4	206.1	199.0	227.8	231.9	224.5	234.7	241.8	3.0
UK	2403.0	2537.8	2418.0	2290.6	2355.3	2215.6	2311.3	2787.7	2923.7	3059.2	2813.3	-8.0
EUR12	:	:	:	:	:	21170.9	:	:	21409.7	21646.4	22131.8	2.2
EU-15	:	:	:	:	:	24079.3	:	:	25096.3	25465.7	25707.1	0.9

Table B.8

**Imputed compensation of non-salaried workers, from 1990-2000  
In current prices and Mio Ecu/Euro  
(non-salaried AWU\* (average compensation of employees per salaried  
AWU))**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	1604.9	1647.7	1716.2	1632.9	1607.3	1597.0	-0.6
DK	1289.8	1256.5	1303.1	1276.5	1252.9	1342.8	1345.5	1351.6	1288.6	1216.8	1170.7	-3.8
D	:	13432.5	10036.1	10159.9	9896.5	10393.9	9678.1	8628.1	7983.3	7966.2	7999.0	0.4
EL	:	:	:	:	:	2874.6	3080.1	3255.9	2898.1	2769.7	2621.9	-5.3
E	7197.0	7218.9	6882.0	6435.1	6130.9	5799.8	5986.6	6023.8	6074.4	5812.6	5686.2	-2.2
F	16432.0	16180.2	16483.2	16742.8	15857.7	15837.3	15305.1	14643.7	14582.4	14675.6	14400.6	-1.9
IRL	:	:	:	:	:	2497.1	:	:	2658.6	2502.9	2430.7	-2.9
I	:	16053.8	15990.9	13122.4	12378.5	13016.6	11799.8	11837.6	10915.7	10316.1	9758.0	-5.4
L	35.9	38.6	40.4	40.7	39.9	42.1	42.9	38.3	38.2	55.6	53.1	-4.5
NL	:	:	:	:	:	3545.3	3807.8	3725.2	3729.9	3494.7	3427.0	-1.9
A	:	:	:	:	:	706.3	660.7	662.8	598.9	691.9	706.7	2.1
P	:	:	:	:	:	2604.5	2455.2	2453.1	2426.3	2459.6	2432.0	-1.1
FIN	14310.1	14350.5	9978.5	9381.2	9422.0	10878.5	8402.3	5413.1	4069.8	3609.3	2538.8	-29.7
S	823.6	802.3	694.5	615.5	592.2	570.9	700.7	765.3	720.9	730.7	757.1	3.6
UK	3535.5	3836.9	3799.6	3691.1	3868.3	3677.7	3895.2	4725.2	5057.8	5287.0	5189.6	-1.8
EUR12	:	:	:	:	:	67101.1	:	:	58720.9	57308.7	56674.9	-1.1
EU-15	:	:	:	:	:	72977.4	:	:	66888.0	65668.2	64737.2	-1.4

Table B.9

**Intermediate consumption, from 1990 to 2000  
in current prices and Mio Ecu/Euro**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	4619.1	4457.7	4400.3	4275.3	4224.2	4555.1	7.8
DK	4542.0	4436.9	4473.9	4639.9	4474.6	4571.6	4674.4	4810.0	4739.7	4578.9	4661.5	1.8
D	:	25643.1	24966.7	25310.2	27877.4	26756.6	26431.5	26095.0	26134.0	24667.3	25443.9	3.1
EL	:	:	:	:	:	2834.4	3023.6	3032.5	2898.8	2908.7	3083.4	6.0
E	11337.7	11599.7	11252.9	9639.3	9738.3	10820.2	11216.3	11399.3	11348.4	11452.3	11783.4	2.9
F	28188.1	28409.3	28638.9	28051.3	28661.1	30242.0	31718.6	31645.8	31305.1	31837.8	32679.7	2.6
IRL	:	:	:	:	:	2654.0	:	:	2911.6	2967.2	3114.2	5.0
I	15844.4	16791.6	15674.2	13784.4	12797.7	12319.1	13837.2	13643.5	13270.4	13168.0	13352.0	1.4
L	121.2	120.1	127.5	119.7	118.0	127.0	130.4	121.4	125.8	122.7	126.8	3.4
NL	:	:	:	:	:	10065.0	10226.1	9982.9	9943.2	9997.2	10473.9	4.8
A	:	:	:	:	:	2990.5	2967.8	3148.6	3048.3	2921.6	2987.3	2.3
P	:	:	:	:	:	2551.0	2770.1	2657.0	2591.0	2912.8	2906.4	-0.2
FIN	3628.3	3199.1	2828.1	2666.1	2712.0	2529.1	2416.2	2443.4	2365.5	2459.8	2595.6	5.5
S	3564.2	3313.0	3134.9	2521.1	2643.7	2713.8	3110.1	3065.8	2911.8	2937.1	2985.4	1.6
UK	11351.3	11929.9	11416.7	11241.3	11550.8	11613.9	12467.2	13940.8	13230.1	13214.3	13173.6	-0.3
EUR12	:	:	:	:	:	108507.9	:	:	110217.3	109639.6	113101.8	3.2
EU-15	:	:	:	:	:	127407.2	:	:	131098.9	130369.9	133922.3	2.7

Table B.10

**Multi factor input, from 1990 to 2000  
In current prices and Mio Ecu/Euro  
(Table B6 + Table B7 + Table B8 + Table B9)**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	% 00/99
B	:	:	:	:	:	7109.5	6941.9	6984.9	6794.2	6716.8	7053.3	5.0
DK	7118.6	6957.5	7084.3	7247.9	7054.7	7321.6	7454.9	7627.7	7493.1	7255.6	7330.1	1.0
D	:	51226.7	46151.6	47052.3	49272.3	49143.4	47563.3	45483.1	44840.8	43430.3	44301.4	2.0
EL	:	:	:	:	:	6776.1	7224.5	7438.3	6910.1	6803.1	6919.4	1.7
E	23585.2	24144.9	23122.1	20496.2	20260.1	21131.7	21958.2	22550.7	22691.1	22634.3	23059.1	1.9
F	55097.9	55301.8	56203.0	56225.4	56018.3	57786.2	58943.5	58244.1	58156.6	59239.0	60199.9	1.6
IRL	:	:	:	:	:	5892.1	:	:	6393.4	6302.3	6534.5	3.7
I	:	48472.9	47870.9	40873.8	38450.2	37481.9	38822.8	39012.3	37635.7	36959.6	36991.3	0.1
L	189.5	196.3	207.7	202.2	201.8	214.4	218.5	203.2	208.8	242.1	242.6	0.2
NL	:	:	:	:	:	17448.0	17880.7	17513.5	17605.0	17364.0	18088.6	4.2
A	:	:	:	:	:	5063.4	4978.9	5142.3	4982.1	4967.2	5045.7	1.6
P	:	:	:	:	:	6382.5	6436.0	6337.6	6255.4	6661.9	6719.4	0.9
FIN	19658.5	19238.9	14229.0	13241.2	13381.4	14627.9	11952.8	8949.9	7522.3	7208.8	6373.9	-11.6
S	5454.5	5184.7	4832.6	3983.6	4078.2	4128.3	4738.3	4753.5	4486.1	4536.4	4623.5	1.9
UK	19745.4	20777.7	19908.2	19414.9	20044.3	19763.8	20992.2	24176.2	23961.8	24335.2	24007.1	-1.3
EUR12	:	:	:	:	:	226357.2	:	:	221108.1	219876.5	224334.1	2.0
EU-15	:	:	:	:	:	257855.9	:	:	258148.8	257128.7	260437.6	1.3

**Table B.11** Weight of the consumption of fixed capital in the multi-factor productivity indicator  
(Table B6 + Table B7 + Table B8 + Table B9)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
B	:	:	:	:	:	0.09	0.08	0.09	0.09	0.09	0.08
DK	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13
D	:	0.12	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16
EL	:	:	:	:	:	0.09	0.09	0.09	0.09	0.10	0.09
E	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
F	0.12	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.13	0.13
IRL	:	:	:	:	:	0.08	:	:	0.09	0.09	0.09
I	:	0.14	0.14	0.15	0.16	0.15	0.17	0.18	0.19	0.20	0.20
L	0.15	0.17	0.17	0.18	0.19	0.18	0.17	0.18	0.18	0.22	0.21
NL	:	:	:	:	:	0.13	0.13	0.13	0.13	0.12	0.12
A	:	:	:	:	:	0.25	0.25	0.24	0.25	0.25	0.24
P	:	:	:	:	:	0.11	0.11	0.11	0.11	0.11	0.11
FIN	0.06	0.06	0.07	0.06	0.06	0.05	0.06	0.08	0.09	0.10	0.11
S	0.14	0.15	0.16	0.16	0.16	0.16	0.15	0.15	0.14	0.14	0.13
UK	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
EUR12	:	:	:	:	:	0.13	:	:	0.14	0.14	0.14
EU-15	:	:	:	:	:	0.13	:	:	0.14	0.14	0.14

**Table B.12** Weight of the volume of total agricultural labour in the multi-factor productivity indicator  
(Table B7/Table B10) + (Table B8/Table B10)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
B	:	:	:	:	:	0.26	0.28	0.28	0.28	0.28	0.27
DK	0.24	0.24	0.25	0.24	0.24	0.25	0.25	0.25	0.24	0.24	0.23
D	:	0.37	0.31	0.31	0.29	0.30	0.29	0.27	0.26	0.27	0.26
EL	:	:	:	:	:	0.49	0.49	0.50	0.49	0.48	0.45
E	0.41	0.41	0.41	0.42	0.41	0.38	0.38	0.38	0.39	0.38	0.37
F	0.37	0.36	0.37	0.38	0.36	0.35	0.34	0.33	0.33	0.33	0.33
IRL	:	:	:	:	:	0.47	:	:	0.46	0.44	0.41
I	:	0.51	0.53	0.51	0.51	0.52	0.47	0.47	0.46	0.45	0.43
L	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.22	0.22	0.27	0.26
NL	:	:	:	:	:	0.29	0.30	0.30	0.31	0.30	0.30
A	:	:	:	:	:	0.16	0.15	0.15	0.14	0.16	0.16
P	:	:	:	:	:	0.49	0.46	0.47	0.47	0.45	0.45
FIN	0.76	0.77	0.73	0.74	0.73	0.77	0.74	0.65	0.59	0.56	0.47
S	0.20	0.21	0.19	0.21	0.20	0.19	0.20	0.21	0.21	0.21	0.22
UK	0.30	0.31	0.31	0.31	0.31	0.30	0.30	0.31	0.33	0.34	0.33
EUR12	:	:	:	:	:	0.39	:	:	0.36	0.36	0.35
EU-15	:	:	:	:	:	0.38	:	:	0.36	0.35	0.35







## NOTES

<sup>1</sup> The EAA was revised following the revision of the European System of Integrated Economic Accounts in 1995 (ESA 95) and in order to adapt to economic and structural developments in the agriculture and forestry sectors.

<sup>2</sup> For further information about production functions see “Economics” by Begg, Fischer and Dornbusch published by McGraw-Hill.

<sup>3</sup> Eurostat has also developed “Income of the Agricultural Households Sector statistics” that present an aggregate picture of the overall income situation of agricultural households, covering income from all sources not just from farming (diversification into non-farm activities having been promoted by successive CAP reforms) and deductions such as taxation and social contributions. The main income concept is net disposable income. For further information see “Income of the Agricultural Households Sector –1999 report”, Theme 5, Eurostat, ISBN: 92-828-8759-6.

<sup>4</sup> The OECD Manual summarises the “objectives of constructing productivity series” in the following way:

- i) Technology - to trace technical change or shifts in the production frontier
- ii) Efficiency - to trace whether the maximum amount of output has been physically achieved with current technology
- iii) Real cost savings - to trace real cost savings in production
- iv) Benchmarking production processes – to identify inefficiencies in the production processes
- v) Living standards – to assess living standards, per capita income being a simple example.

<sup>5</sup> In line with the OECD manual, the term “multi-factor” has been used as a synonym for “total-factor productivity” *to signal a certain modesty with respect to the capacity of capturing all factors’ contribution to output growth*. However, the reference to “partial productivity” rather than its synonym “single-factor productivity” is preferred for this publication.

<sup>6</sup> Volume measures of productivity have been selected but prices play an indirect role in the way that the volumes of different commodities are weighted together. If producer prices are used in the calculation, a subsidised product will be given a lower weighting *vis-à-vis* if basic prices were used. Some empirical work carried out for Eurostat showed that in the Member State study case, there was very little difference in productivity growth according to the two price concepts. With basic prices being the focus price of the EAA it was decided that it would also be the initial focus for the productivity indicators. However, further empirical work will be carried out for the other Member States and discussions with users will be conducted.

<sup>7</sup> The empirical work carried out for Eurostat showed that there was little difference between the weighting of non-salaried labour input by average compensation per employee or by a three-year moving average of entrepreneurial income.

<sup>8</sup> The Farm Structure Survey and Labour Force Survey conducted by Eurostat offer some demographic breakdowns of labour input that will be explored but there are problems of a corresponding breakdown in their remuneration.

<sup>9</sup> A review of the definitions of the Annual Work Unit used by Member States will be conducted in 2001 in order to determine whether they are specific to agriculture or pan-industry based and whether the number of hours determining full-time work requires any adjustment for more recent labour developments.

<sup>10</sup> As mentioned in footnote 5, it should be remembered that prices play an indirect role in the way that the volumes of different commodities are weighted together. Whilst quantities of a product group may increase, the volume of output of that product group also reflects the changes in the overall weight (reflecting shifts within the group and the different price levels).

<sup>11</sup> Eurostat plans to publish a detailed Statistics in Focus on the volume of agricultural labour around the end of May 2001. The emphasis of this analytical report will be on changes and reasons for change in 2000 and how these latest developments fit with the longer-term trends noted for Member States.

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