Department for Environment Food & Rural Affairs

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Total factor productivity of the UK agricultural industry 2012 – 2nd estimate

This release presents the second estimate of total factor productivity of the UK agricultural industry and volume indices for 2012. Total factor productivity of the agricultural industry in the United Kingdom is an indicator of how well inputs are converted into outputs giving an indication of the efficiency and competitiveness of the industry. Year to year variations in total factor productivity may be due to factors outside the farmer's control, such as, weather conditions or disease outbreaks. The second estimate incorporates data that has become available since the first estimate and revisions may have also been made to previous years.

Key points:

- Total factor productivity of the agricultural industry in the United Kingdom is estimated to have fallen by 2.9% between 2011 and 2012, its lowest level since 2007. This is the largest single year fall in total factor productivity since 1985. The fall in total factor productivity reflects the impact of poor weather on the agricultural production process during 2012.
- Over the longer period, the volume of final output has remained largely unchanged between 1986 and 2012 while the volume of all inputs and entrepreneurial labour fell by 19%, leading to total factor productivity increasing by 21%. Total factor productivity was broadly level between the mid-1980s and mid-1990s, increased by 18% between 1997 and 2005 and has since remained mostly level with year to year variations.
- This is the first release to use 2010 as the base year for total factor productivity. Previous releases used 2005 as the base year.

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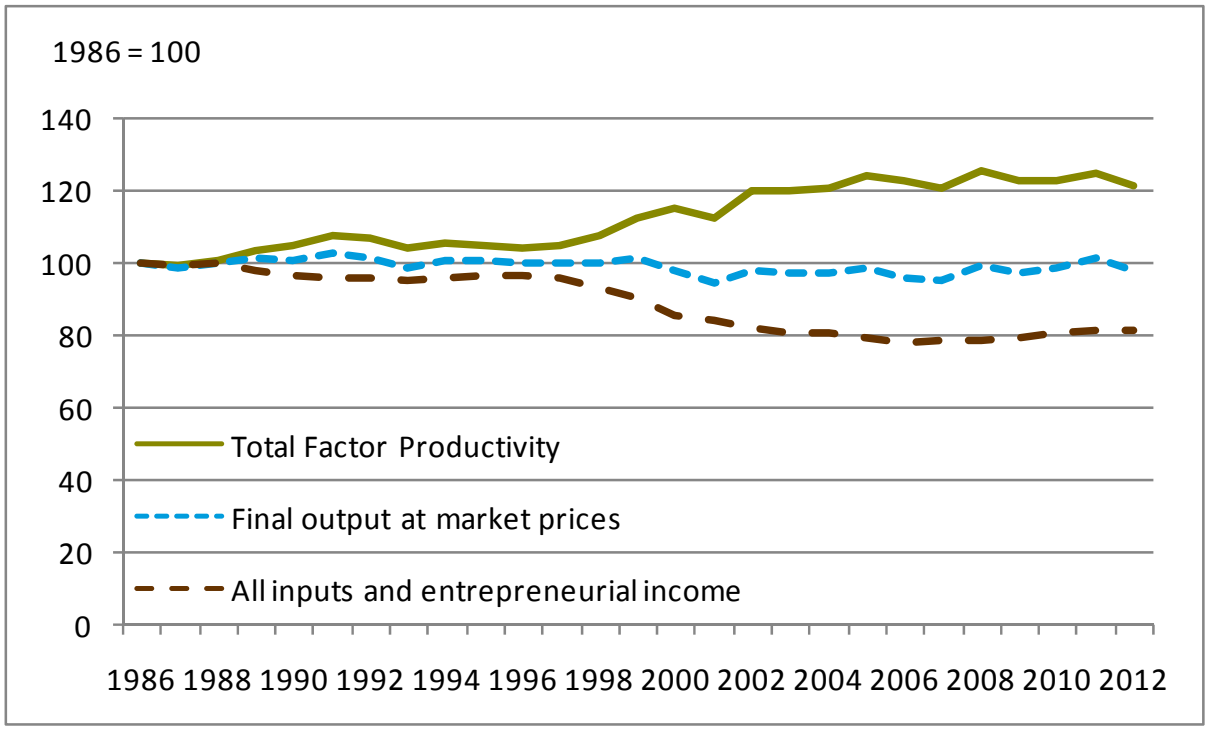
Latest figures and long term trends

Figure 1 and Table 1 show the trends in total factor productivity, final output at market prices and all inputs and entrepreneurial labour between 1986 and 2012.

Figure 1: Total factor productivity of the UK agricultural industry



Total factor productivity of the agricultural industry in the United Kingdom is estimated to have fallen between 2011 and 2012 by 2.9% to its lowest level since 2007. This is largely driven by a fall of 3.2 % in the volume of final output at market prices, whilst the volume of all inputs and entrepreneurial labour used in the production process fell marginally (0.2%). This fall in total factor productivity reflects the impact of poor weather during 2012 on agricultural activity.

This is the largest annual decrease in productivity since 1985 when there was a 3.7% decrease in productivity. The decrease in 1985 was also due to poor weather conditions but 1985 followed a particularly productive year in 1984 when growing conditions were favourable. The decrease in productivity in 2012 was larger than that seen in 2001 when there was an outbreak of Foot and Mouth Disease in the UK. In 2001 there was a larger fall in outputs of 3.8% but also a larger decrease in inputs of 1.9%.

Crop output was particularly affected by poor weather during 2012, with the volume of wheat output falling by 9.4% compared to 2011 to its lowest level since 2001. The volume of oilseed rape output fell by 7.3% between 2011 and 2012 following very poor weather during spring and summer 2012, partly offset by an increase in area following favourable planting conditions in autumn 2011, but remained 28% higher than in 2007. The volume of output of potatoes was down 23% compared to 2011 as poor weather interrupted planting

in the spring and led to low yielding potato crops and increased wastage. Output of sugar beet, down 14%, and fruit, down 8.5%, were also affected by cold and wet weather.

Livestock output was generally less impacted by the poor weather in 2012 other than sheep output, down 4.5%, where poor weather in the second half of the year hampered the marketing of lambs resulting in a large carryover of the 2012 lamb crop into 2013.

While weather conditions or other factors such as disease outbreaks may have short term impact on agricultural productivity, it is developments in productivity over a longer period that constitute one of the main drivers of agricultural income. Productivity growth means that more value is added in production and more income is available to be distributed.

Over the longer period, the volume of final output has remained largely unchanged between 1986 and 2012 while the volume of all inputs and entrepreneurial labour used in the production process fell by 19% leading to total factor productivity for the agricultural industry in the United Kingdom increasing by 21%. Total factor productivity was broadly level between the mid-1980s and mid-1990s, increased by 18% between 1997 and 2005 and, has since remained broadly level with year to year variations

The volume of total crop output is 5.9% higher than in 2007 while the volume of total livestock output is 2.2% higher. However theses increases in outputs were virtually mirrored by the increases in inputs with total factor productivity only increasing by 0.6% over the period. Total intermediate consumption is estimated to be 6.7% higher than in 2007. This was driven by large increases in plant protection products, agricultural services and veterinary expenses. In contrast to most of the other inputs, the volume of fertiliser used has fallen by 11% and entrepreneurial labour fell by 1.2% over the same period.

Table 1: Output and input volume indices

2010=100

	2007	2008	2009	2010	2011	2012
1 Output of cereals	90.2	113.4	102.7	100.0	97.4	93.6
of which wheat	89.2	115.3	95.6	100.0	97.9	88.7
barley	92.0	109.7	122.7	100.0	100.8	105.0
2 Output of industrial crops	89.3	94.3	98.6	100.0	118.2	106.0
of which oilseed rape	89.6	88.5	85.7	100.0	123.7	114.6
sugar beet	103.2	117.1	129.6	100.0	130.3	111.7
3 Output of forage plants	89.6	83.5	106.7	100.0	95.9	76.9
4 Output of vegetables and horticultural products	96.6	98.5	96.2	100.0	97.7	97.4
of which fresh vegetables	89.8	92.1	96.1	100.0	98.2	94.0
plants and flowers	106.1	107.2	96.4	100.0	97.2	101.6
5 Output of potatoes (including seeds)	109.5	118.2	120.0	100.0	107.7	83.0
6 Output of fruit	91.7	94.6	99.9	100.0	100.8	92.3
7 Output of other crop products including seeds	62.2	101.9	104.7	100.0	99.3	140.6
Total crop output	**92.2**	**104.2**	**101.6**	**100.0**	**101.6**	**97.6**
8 Output of livestock	100.6	101.1	97.7	100.0	104.0	103.6
primarily for meat	100.0	99.3	96.5	100.0	102.9	102.5
of which cattle	99.8	98.1	95.4	100.0	103.3	101.1
pigs	100.1	99.0	95.6	100.0	107.1	108.9
sheep	114.8	111.7	108.1	100.0	105.9	101.1
poultry	92.6	94.5	91.7	100.0	98.9	102.0
gross fixed capital formation	103.0	110.1	103.8	100.0	110.2	109.6
of which cattle	107.2	127.3	108.7	100.0	107.4	116.7
pigs	90.3	101.8	90.1	100.0	108.8	120.6
sheep	109.8	77.1	96.1	100.0	119.5	100.9
poultry	82.7	84.6	96.6	100.0	104.1	97.9
9 Output of livestock products	98.3	97.0	96.2	100.0	101.3	99.0
of which milk	100.9	98.6	97.5	100.0	101.5	99.9
eggs	83.0	88.3	89.2	100.0	99.6	96.5
Total livestock output	**99.8**	**99.6**	**97.2**	**100.0**	**103.1**	**102.0**
10 Other agricultural activities	78.0	88.8	95.5	100.0	110.5	108.2
11 Inseparable non-agricultural activities	85.4	86.0	96.6	100.0	98.3	100.9
12 Output (at market prices)	**95.1**	**100.1**	**98.6**	**100.0**	**102.6**	**100.6**
13 Total subsidies (less taxes) on product	. .	. .	. .	. .	. .	. .
14 Gross output (at basic prices)	**95.1**	**100.1**	**98.6**	**100.0**	**102.6**	**100.5**

Table 1: Output and input volume indices *cont.*

2010=100

	2007	2008	2009	2010	2011	2012
Intermediate consumption						
15 Seeds	112.8	107.5	104.8	100.0	104.8	109.7
16 Energy	95.3	91.0	103.2	100.0	97.1	97.6
of which electricity and fuels for heating	94.6	94.6	100.2	100.0	95.2	94.9
motor and machinery fuels	95.6	89.6	104.5	100.0	97.8	98.6
17 Fertilisers	109.7	97.6	88.4	100.0	104.0	97.4
18 Plant protection products	75.9	89.8	91.3	100.0	106.5	120.4
19 Veterinary expenses	82.6	96.3	102.1	100.0	100.1	104.1
20 Animal feed	92.0	92.9	94.7	100.0	92.3	94.3
of which compounds	95.5	94.9	93.6	100.0	97.3	102.9
straights	84.8	88.7	91.5	100.0	85.9	80.9
feed produced and used on farm or purchased from other farms	94.9	94.6	109.1	100.0	85.6	88.4
21 Total maintenance	90.2	95.4	98.9	100.0	99.5	95.1
of which materials	93.9	94.8	97.6	100.0	101.0	95.3
buildings	84.4	96.2	101.2	100.0	97.2	94.7
22 Agricultural services	78.0	88.8	95.5	100.0	110.5	108.2
23 FISIM	93.0	96.0	94.6	100.0	95.9	96.6
24 Other goods and services	96.8	99.8	102.5	100.0	102.9	102.4
25 Total intermediate consumption	**93.6**	**95.3**	**97.3**	**100.0**	**99.5**	**99.9**
26 Gross value added at market prices	**97.8**	**109.5**	**101.1**	**100.0**	**108.5**	**102.0**
27 Gross value added at basic prices	**97.9**	**109.5**	**101.1**	**100.0**	**108.5**	**101.9**
28 Total Consumption of Fixed Capital	100.1	103.1	98.0	100.0	106.2	107.2
of which equipment	92.3	94.3	97.0	100.0	106.6	110.5
buildings	103.2	102.3	100.8	100.0	100.8	100.0
livestock	106.5	115.4	97.0	100.0	109.4	108.5
cattle	108.7	121.3	93.2	100.0	112.2	112.6
pigs	98.8	107.3	93.8	100.0	114.1	121.9
sheep	111.6	116.2	109.8	100.0	104.0	96.0
poultry	86.2	86.7	93.3	100.0	107.9	113.8
29 Net value added at market prices	**95.3**	**116.1**	**104.3**	**100.0**	**110.6**	**97.9**
30 Net value added at basic prices	**95.5**	**115.9**	**104.3**	**100.0**	**110.5**	**97.8**
Compensation of employees	101.2	102.0	100.7	100.0	102.4	102.4
Entrepreneurial workers (farm and specialist contractors)	103.0	101.9	100.3	100.0	101.3	101.8

Final output at market price	96.0	100.1	98.1	100.0	102.4	99.1
All inputs and entrepreneurial labour	97.8	97.8	98.1	100.0	100.6	100.4
Total factor productivity	98.2	102.4	99.9	100.0	101.7	98.7

Note: . . means no data available or not applicable

Definitions and explanations

Final output at market prices: Output excluding subsidies linked to products and transactions within the industry.

All inputs and entrepreneurial labour: Goods and services consumed in the productive process and the labour of those with an entrepreneurial interest in the farm business, e.g. farmers, partners.

Total factor productivity: Final output at market prices divided by all inputs and entrepreneurial labour.

Description of total factor productivity

Total factor productivity is a key measure of the economic performance of agriculture and an important driver of farm incomes. It represents how efficiently the agricultural industry uses the resources that are available to turn inputs into outputs. Outputs and inputs are adjusted for quality by weighting the volumes by price.

Results are measured in terms of the trend in volume of output leaving the industry per unit of all inputs including labour. Changes from year to year are often shaped by factors outside the control of farmers, such as weather, animal disease, policy interventions, general economic conditions, and other factors, and are rarely the main driving factor behind short-term changes in farm income. However, over a longer period, developments in productivity constitute one of the major factors that impact on income.

These results are produced as part of the preparation of aggregate agricultural accounts required by EU legislation and by UK policy making. The accounts also produce other measures of the performance of the agricultural industry, including Total Income from Farming.

Basic quality information

Estimates for 2012 are based on incomplete data. The amounts of data available are presented in Table 2 below. Over time, more data becomes available, estimates are revised and forecasts are replaced.

Table 2: Approx. amount of data available for 2012 values.

	May 2013	December 2013
Output	84%	98%
Intermediate consumption	40%	84%
Subsidies	95%	100%
Other costs	57%	98%

Revisions

All estimates, by definition, have an element of uncertainty that is inherent in any process or calculation that uses sampling, estimation or modelling. There is no simple way of measuring the accuracy of the estimates – that is, the extent to which estimates measures the underlying ‘true’ value for a particular period. One dimension of measuring accuracy is reliability, which is measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequently estimated values.

This is the first release to use 2010 as the base year for total factor productivity. In previous releases 2005 was used as the base year. Although the value of the indices have changed, now 2010 equals 100 rather than 2005, the year on year changes will be the same.

Table 3 below presents a revision analysis of key values for 2012 that were published in May 2013. Revisions have been made owing to further information becoming available.

Table 3: Revisions made to the 2012 estimate of total factor productivity between May 2013 and November 2013

2010 = 100	May-13	Dec-13	Revision May-13/ Dec-13
Final output at market prices	98.7	99.1	0.5%
All input and entrepreneurial labour	100.2	100.4	0.2%
Total Factor Productivity	98.4	98.7	0.3%

Summary quality report

A summary quality report for this statistical release can be found on the GOV.UK website at https://www.gov.uk/government/collections/productivity-of-the-agricultural-industry

This is an overview note which is not release specific but will be reviewed and updated at regular intervals. It pulls together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output. It relates to estimates of Total Income from Farming and aim to provide users with information on usability and fitness for purpose of these estimates.

Quality Assurance

Defra has in place quality assurance processes to check the accuracy and reliability of the aggregate agricultural accounts that includes:

- Ongoing review of methods employed in the calculation of the accounts.
- Assessment of the quality of the estimates of components of the accounts with internal experts.
- Discussion of components of the accounts with external experts.
- Quality assessments made by Eurostat, the statistical office of the European Union.

Main uses of total factor productivity

Total factor productivity is used in conjunction with other economic information to:

- Inform policy decisions and to help monitor and evaluate current policies relating to agriculture in the UK by Government and in the European Union by the European Commission.
- Inform stakeholders of the performance of the agricultural industry.
- Inform research into the economic performance of the agricultural industry.
- As an impact indicator of Government policy.

User engagement

As part of our ongoing commitment to compliance with the Code of Practice for Official Statistics http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html, we wish to strengthen our engagement with users of these statistics and better understand the use made of them and the types of decisions that they inform. Consequently, we invite users to make themselves known, to advise us of the use they do, or might, make of these statistics, and what their wishes are in terms of engagement. Feedback on this notice and enquiries about these statistics are also welcome.

Publication policy

First estimates of Total Income from Farming and the production and income accounts for the UK agricultural industry are published at the end of April followed by more detailed information in the publication 'Agriculture in the United Kingdom'. The production and income accounts are then updated and published at the end of the following November when Farm Business Survey data is available to inform estimates of elements of intermediate consumption. The production and income accounts may be revised later as further data becomes available.

DEFRA publishes all of its statistics and releases on the GOV.UK internet site at https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/statistics.Pre-announced publication dates can be found on the National Statistics Publication Hub at http://www.statistics.gov.uk/hub/release-calendar/index.html