

Average Earnings Index

Data Sheet

Index numbers provide a simple way of representing changes over time. Each value is expressed as a percentage of a **base value** which is the value that occurred in a **base period**.

The index numbers below show how average earnings in different sectors changed between 2000 and 2006. The index number for each sector is taken as 100 in 2000 and the values in later years are based on this. This makes it easy to compare the way in which earnings in each sector have changed over this period of time.

Average Earnings Index		Source: Office for National Statistics			
	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
2000	100.0	100.0	100.0	100.0	100.0
2001	105.9	104.4	105.8	102.9	106.1
2002	112.0	108.2	109.4	107.0	113.0
2003	117.0	110.2	112.4	110.9	119.3
2004	121.6	112.2	119.2	113.9	126.6
2005	124.5	116.8	124.3	116.6	132.5
2006	132.7	123.3	125.8	119.4	137.5

Percentage changes

When comparing average earnings in any year with average earnings in the base year, 2000, the percentage change is simply the difference between the given index number and 100.

For example, in 2006, average earnings in Agriculture were 32.7% higher than in 2000.

The percentage change from year A to year B , when neither of these is the base year, can be found using:

$$\% \text{ change} = \frac{I_B - I_A}{I_A} \times 100 \text{ where } I_A \text{ and } I_B \text{ are the index numbers in years } A \text{ and } B.$$

For example, the % change in average earnings in Health and Social Work from 2002 to 2004 was:

$$\frac{126.6 - 113.0}{113.0} \times 100 = 12\% \text{ (to the nearest \%)}.$$



The following table gives the average earnings index for each sector in the first six months of 2007.

Average Earnings Index		<i>Source: Office for National Statistics</i>			
	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
Jan	127.6	123.9	126.7	120.5	139.8
Feb	120.0	126.3	128.3	120.0	139.5
Mar	135.4	134.6	135.9	128.4	140.5
Apr	133.6	127.1	125.9	126.4	140.7
May	134.9	128.1	126.6	124.1	141.7
Jun	124.9	128.0	128.3	126.3	142.5

Note

When average earnings **increase** the % change is **positive**.

When average earnings **decrease** the % change is **negative**.

For example, the % change in average earnings in Agriculture from January to February was:

$$\frac{120.0 - 127.6}{127.6} \times 100 = -5.96\% \text{ (to 2dp).}$$

Average earnings decreased by 5.96% between January and February 2007.



Average Earnings Index

Worksheet

1 What was the % change in average earnings in Construction from 2000 to 2006?

2 Between 2000 and 2006 in which sector did average earnings increase by:
 (a) the most? (b) the least ?

3 (a) Complete the table below to show the percentage changes in the average earnings index for each sector from 2003 to 2005. Give answers to 1 decimal place.

% changes in the Average Earnings Index from 2003 to 2005					
Sector	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
% change					

(b) List the sectors in order of the % change in average earnings. Start with the sector with the largest increase.

4 (a) Complete the table to give the monthly percentage changes in the average earnings index for each sector between January and June 2007. (Give answers to 2 dp.)

Monthly % changes in the Average Earnings Index between January and June 2007					
	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
Feb	- 5.96%				
Mar					
Apr					
May					
Jun					

(b) Compare the way in which average earnings in the sectors changed in this period.



Teacher Notes

Unit Advanced Level, Mathematical Principles for Personal Finance

Notes on Activity

The information used on the Data Sheet (pages 1 & 2) for this activity is from the Times Series Data facility on the National Statistics website at <http://www.statistics.gov.uk/statbase/tsdintro.asp>. The average earnings index numbers used are not seasonally adjusted and include bonus payments. It is intended that the activity is used near the start of the course to give learners practice in using index numbers to find percentage changes.

Answers

- 1 25.8%
 2 (a) Health & Social Work (b) Retail
 3 (a)

% changes in the Average Earnings Index from 2003 to 2005					
Sector	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
% change	6.4%	6.0%	10.6%	5.1%	11.1%

(b) Health & Social, Construction, Agriculture, Manufacturing, Retail

- 4 (a)

Monthly % changes in the Average Earnings Index between January and June 2007					
	Agriculture	Manufacturing	Construction	Retail	Health & Social Work
Feb	- 5.96%	1.94%	1.26%	- 0.41%	- 0.21%
Mar	12.83%	6.57%	5.92%	7.00%	0.72%
Apr	- 1.33%	- 5.57%	- 7.36%	- 1.56%	0.14%
May	0.97%	0.79%	0.56%	- 1.82%	0.71%
Jun	- 7.41%	- 0.08%	1.34%	1.77%	0.56%

- (b) Some of the points that may be made are given below:
 Average earnings were more variable in Agriculture than any other sector (varying from - 7.41% to 12.83%). This may be due to seasonal factors such as the weather and the use of cheap casual labour at busy times. Average earnings were less variable in Health and Social Work than any other sector, maintaining a fairly steady rise (less than 1%) in most months. This sector is less likely to depend on seasonal changes.
 Average earnings in most sectors increased in March but then fell in April. This may have something to do with the time of the Easter break or the fact that the new financial year started in April.
 Other increases or decreases may be related to demand or supply of labour in the sectors concerned. For example, the average wage index in Retail fell in February and this may be due to reduced work and bonus payments in the quieter time after the January sales are over.

Possible Extensions

Ask learners to search for and use information from www.statistics.gov.uk to:

- compare changes in the Average Earnings Index with changes in the RPI or the CPI over the same period of time
- study how the Average Earnings Index is calculated.

