PRODUCTIVITY AND GROWTH ACCOUNTING

Economic growth can be increased either by raising the labour and capital inputs used in production, or by greater overall efficiency in how these inputs are used together, *i.e.* higher multi-factor productivity (MFP). Growth accounting involves breaking down GDP growth into the contribution of labour inputs, capital inputs and MFP growth.

Definition

Growth accounting explains output growth by the rates of change of labour and capital inputs and by MFP growth, computed as a residual. In these calculations, the growth rates of labour and capital inputs are weighted with their respective share in total costs. Thus, for example, the contribution of labour to GDP growth is measured as the speed with which labour input grows, multiplied by the share of labour in total costs.

In the tables and graphs, the contribution of capital to GDP growth is broken down into ICT capital (ICT capital includes hardware, communication and software) and non-ICT capital (transport equipment and non residential construction; products of agriculture, metal products and machinery other than hardware and communication equipment; and other products of non-residential gross fixed capital formation).

Comparability

The appropriate measure for capital input with the growth accounting framework is the flow of productive services that can be drawn from the cumulative stock of past investments in capital assets. These services are estimated by the OECD using the rate of change of the "productive capital stock". This measure takes into account wear and tear and retirements, *i.e.*, reductions in the productive capacity of the fixed assets. The price of capital services for each type of asset is measured as their rental price. In principle, the latter could be directly observed if markets existed for capital services. In practice, however, rental prices have to be imputed for most assets, using the implicit rent that capital goods' owners "pay" themselves (or "user costs of capital").

The measure of total hours worked is an incomplete measure of labour input because it does not account for changes in the skill composition of workers over time, such as those due to higher educational attainment, and work experience. Adjustment for such attributes would provide a more accurate indication of the contribution of labour to production. In the absence of these adjustments, as is the case in the series shown here, more rapid output growth due to a rise in skills of the labour force are captured by the MFP residual, rather than being attributed to labour. This should be kept in mind when interpreting rates of MFP growth.

Overview

From 1985 to 2008, GDP growth in most OECD countries was for a large part driven by growth in capital and MFP. In many countries, growth in capital accounted for around one third of GDP growth from 1985 to 2008. Over the same period, ICT capital services represented between 0.2 and 0.6 percentage points of growth in GDP. The GDP-contribution from ICT capital was largest in Sweden, Australia, the United Kingdom and the United States and smallest in France, Austria and Ireland.

In contrast, growth in labour input was important for a few countries over 1985-2008, notably Ireland, Australia, and Canada. However, Germany, Finland and Japan experienced negative GDP contributions of labour inputs. Over the same period, MFP growth was a significant source of GDP growth in Ireland, Finland, Japan and Belgium, while its contribution was very small in Italy, Spain and Canada.

Sources

- OECD Productivity Database.

Further information

Analytical publications

- OECD (2003), *The Sources of Economic Growth in OECD Countries*, OECD, Paris.
- OECD (2004), *Understanding Economic Growth A Macro-level, Industry-level, and Firm-level Perspective*, OECD, Paris.
- OECD (2007), *OECD Science, Technology and Industry Scoreboard 2007*, OECD, Paris.

Methodological publications

- OECD (2001), *Measuring Productivity – OECD Manual Measurement of Aggregate and Industry-level Productivity Growth*, OECD, Paris.
- Schreyer, P. (2004), "Capital Stocks, Capital Services and Multi-factor Productivity Measures", *OECD Economic Studies No. 37, 2003/2*, OECD, Paris, pp. 163-184.
- Schreyer, P., P.-E. Bignon and J. Dupont (2003), *OECD Capital Services Estimates*, OECD Statistics Working Papers, No. 2003/6, OECD, Paris.

Web sites

- OECD Compendium of Productivity Indicators, *www.oecd.org/statistics/productivity/compendium*.
- OECD Productivity, *www.oecd.org/statistics/productivity/*.

Contributions to GDP growth

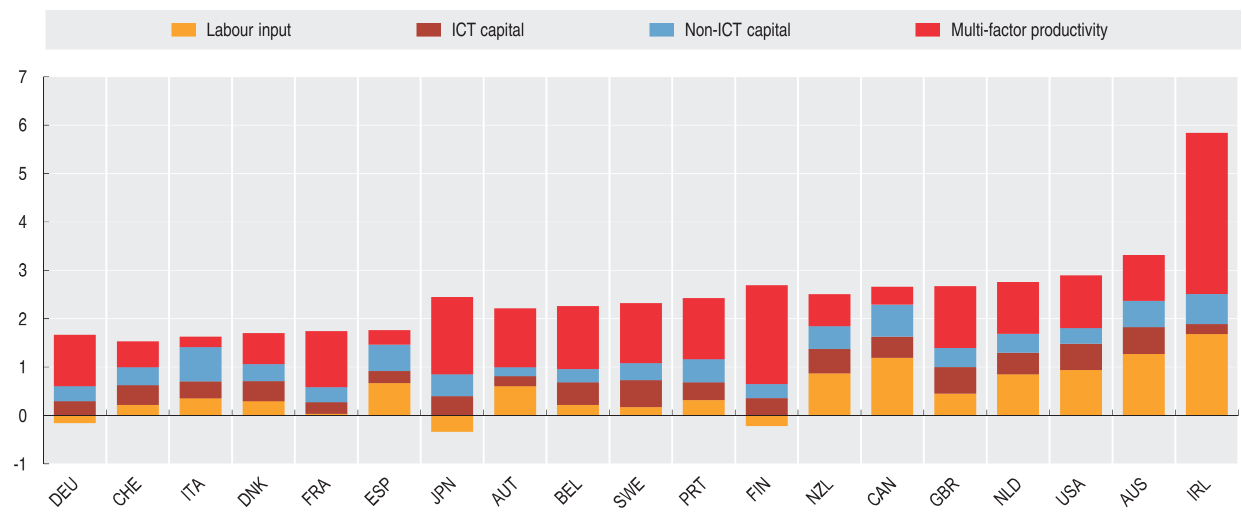
Average annual growth in percentage, 1985-2008 (or closest comparable period)

	Labour input	ICT capital	Non-ICT capital	Multi-factor productivity	GDP growth
Australia	1.27	0.55	0.55	0.94	3.31
Austria	0.60	0.21	0.18	1.22	2.20
Belgium	0.22	0.46	0.28	1.30	2.26
Canada	1.19	0.44	0.66	0.37	2.65
Denmark	0.29	0.42	0.35	0.64	1.70
Finland	–0.22	0.36	0.29	2.04	2.45
France	0.03	0.24	0.31	1.16	1.75
Germany	–0.16	0.29	0.31	1.07	1.50
Ireland	1.68	0.21	0.62	3.33	5.84
Italy	0.35	0.35	0.71	0.22	1.63
Japan	–0.34	0.40	0.45	1.60	2.10
Netherlands	0.85	0.45	0.39	1.07	2.77
New Zealand	0.87	0.51	0.46	0.66	2.50
Portugal	0.32	0.36	0.48	1.26	2.42
Spain	0.67	0.25	0.54	0.30	1.76
Sweden	0.17	0.56	0.35	1.24	2.32
Switzerland	0.22	0.40	0.37	0.54	1.53
United Kingdom	0.45	0.55	0.40	1.27	2.67
United States	0.94	0.54	0.32	1.09	2.89

StatLink http://dx.doi.org/10.1787/824238771241

Contributions to GDP growth

Average annual growth in percentage, 1985-2008 (or closest comparable period)



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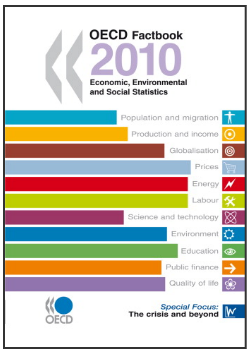

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