Chapter 4

An Overview of OECD Economic Statistics

How can we compare the economic structure of OECD countries? Are small and medium enterprises more efficient than the large ones? How can we measure innovation or globalisation? Are the official measures of inflation reliable? This chapter shows how economic statistics published by the OECD can help in answering these and other questions relevant both for analytical and policy purposes. In particular, for each topic (statistics on agriculture, energy, industry and services, national accounts, etc.) the key definitions used to compile internationally comparable statistics are presented, together with the sources. The chapter also describes some of the activities already underway or planned to improve the quality of OECD statistics. Finally, charts and tables are used to highlight just a subset of data available in OECD databases and publications.

4 AN OVERVIEW OF OECD ECONOMIC STATISTICS

4.1 Agriculture and fishery statistics

The OECD collects and compiles a wide range of data used to support its agricultural policy analysis (see Box 1) and long-term forecasts. These activities are carried out in co-operation with other international organisations, notably the Food and Agriculture Organisation (FAO) and UNCTAD.

OECD agriculture statistics are focused, first of all, on current developments in agricultural markets for major temperate zone agricultural commodities. Detailed information for production, consumption, trade, stocks and prices are collected for OECD countries and a large number of other countries (including China, Argentina, Brazil, India, South Africa, Russia and other CIS independent states and many smaller countries in Africa, Asia and Latin America). Most series cover the period from 1970 to the most current year and include updated annual projections for up to 10 years in the future.

Fisheries statistics include the collection and dissemination of annual data concerning landings (harvest) and processing, fleet, fishers, employment, trade, aquaculture and government financial transfers. The data are used for analytical purposes and serve as reference for other international organisations and as a means for cross-checking and reconciling information from national sources. At the international level, co-ordination takes place among agencies involved in fisheries statistical programmes. Furthermore, analytical work on the economics of fisheries asks for a number of specialised datasets to be created in support of such work.

A major database is maintained with essential information for the assessment of agricultural market access (AMAD). It contains a common dataset on tariffs, tariff-rate quotas and imports so that researchers, policy makers and others can analyse the levels of tariff protections in agriculture among members of the World Trade Organisation (WTO). The development and use of a common dataset can assist in improving international transparency of agricultural trade as covered by multilateral rules and disciplines.

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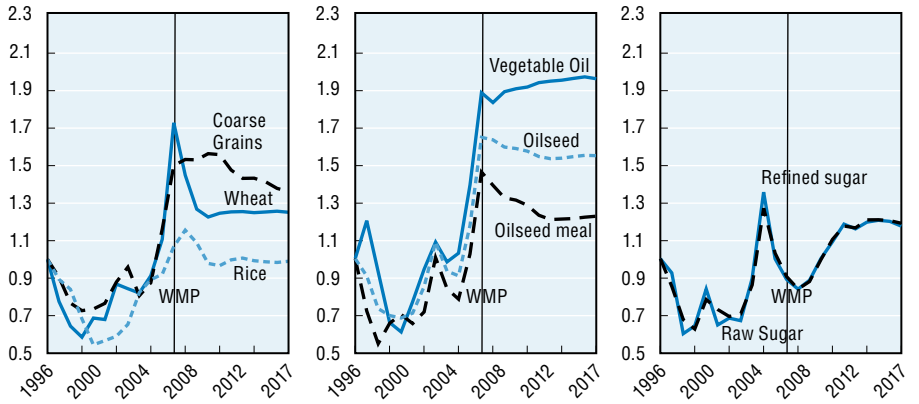
Figure 4.1.1 – **Outlook for world crop prices to 2017**

Index of nominal prices, 1996=1



StatLink http://dx.doi.org/10.1787/335406334811

Source: OECD (2008), *OECD-FAO Agricultural Outlook 2008-2017*, OECD Publishing

The OECD Producer and Consumer Support Estimates

To support its policy work, the OECD also compiles a unique set of statistics called Producer and Consumer Support Estimates. Compiled since 1987, these statistics present the monetary value of transfers associated with all policy measures affecting agriculture. These are classified into a number of major groups that relate to the implementation criteria of the measures. The most important distinctions relate to whether measures are based on commodity output, on input use, on other criteria such as land area, animal numbers, income or revenue, or finally on non-commodity criteria. Whether production is required or not in order to benefit from a measure is another important criterion identified for all measures. With the reform of agricultural policies in OECD countries, the number and complexity of policy measures has increased significantly and the classification and nomenclature evolves in response. Currently, the indicators most commonly used in policy monitoring and analysis are:

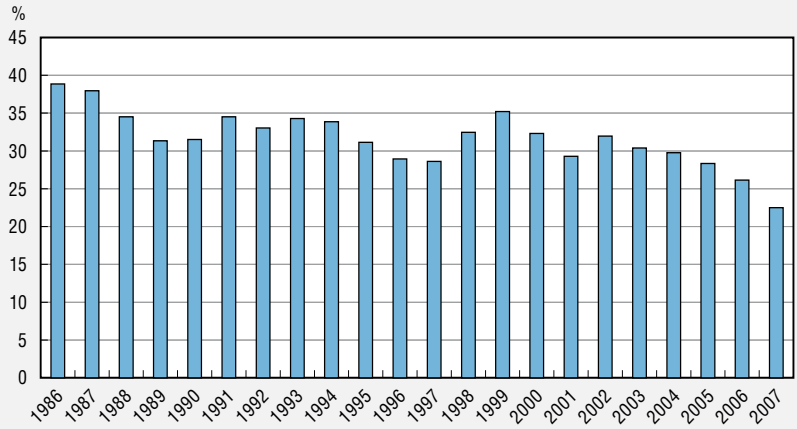
- **Producer Support Estimate (PSE):** annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. The PSE measures support arising from policies targeted at agriculture relative to a situation without such policies, i.e. one in which producers are subject only to the general policies (including economic, social, environmental and tax policies) of the country.
- **General Services Support Estimate (GSSE):** monetary value of gross transfers to general services provided to agriculture collectively, arising from policy measures that support agriculture, regardless of their nature, objectives and impacts on farm production, income or consumption of farm products. These payments for eligible private or public general service are provided to the agricultural sector collectively and not individually to farmers.

The OECD Producer and Consumer Support Estimates *(cont.)*

- **Consumer Support Estimate (CSE):** monetary value of gross transfers to (from) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. The CSE includes explicit and implicit consumer transfers to producers of agricultural commodities, measured at the farm gate (first consumer) level. When negative, transfers from consumers measure the implicit tax on consumption associated with policies to the agricultural sector.
- **Total Support Estimate (TSE):** monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products. The TSE measures the overall cost of agricultural support financed by consumers and taxpayers net of import receipts.

Figure 4.1.2 – **Total Support Estimates for OECD countries**

As percentage of GDP, 1986-2007



StatLink http://dx.doi.org/10.1787/335411615202

Source: OECD (2008), "PSE/CSE" in *OECD Agricultural Statistics – online database*.

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Further information

Publications

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OECD (2007), *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, OECD Publishing
OECD (2007), *Agricultural Policies in Non-OECD Countries: Monitoring and Evaluation*, OECD Publishing
OECD (2008), *OECD-FAO Agricultural Outlook 2008-2017*, OECD Publishing
OECD (2006), *Review of Fisheries in OECD Countries: Vol. 2 - Country Statistics, 2002-2004*, OECD Publishing
OECD (2005), *Review of Fisheries in OECD Countries: Volume 1: Policies and Summary Statistics*, OECD Publishing

Websites

www.agri-outlook.org
www.oecd.org/agr/support/
www.oecd.org/agr/fish/
www.amad.org

4.2 Energy statistics

Data for energy statistics are compiled by the International Energy Agency (IEA), an autonomous Agency of the OECD. The IEA acts as energy policy advisor for its member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Founded during the oil crisis of 1974, its initial role was to coordinate measures in times of oil supply emergencies. But during recent decades, the energy markets have changed, and so has the IEA. It now focuses well beyond oil crisis management on broader energy issues, including climate change policies, market reform, energy technology collaboration and outreach to the rest of the world.

The IEA collects, processes and publishes data and information on energy production, trade, stocks, transformation, consumption, prices and taxes as well as on greenhouse gas emissions for the 30 OECD member countries and over 100 non-OECD countries worldwide. The statistics are published in 10 annual and two quarterly publications; they also are available on CD-ROMs and Internet services. The annual publications include:

- *Energy Statistics of OECD Countries:* contains data on energy supply and consumption in original units for coal, oil, natural gas, combustible renewables/wastes and products derived from these primary fuels, as well as for electricity and heat for the 30 OECD member countries.
- *Energy Statistics of Non-OECD Countries:* a similar publication to the Energy Statistics of OECD Countries but for over 100 non-OECD countries all around the world.
- *Energy Balances of OECD Countries:* presents standardised energy balances expressed in "million tonnes of oil equivalent" for the 30 OECD member countries. Energy supply and consumption data are presented by main fuel: coal, oil, gas, nuclear, hydro, geothermal/solar, combustible renewables/wastes, electricity and heat. This allows for easy comparison of the contributions each fuel makes to the economy and their interrelationships through the conversion of one fuel to another. All of this is essential for estimating total energy supply, forecasting, energy conservation and analysing the potential for interfuel substitution.
- *Energy Balances of Non-OECD Countries:* a similar publication to the Energy Balances of OECD Countries but for over 100 non-OECD countries all around the world.
- *Electricity Information:* provides essential statistics on electricity and heat for each OECD member country by bringing together information on production, installed capacity, input energy mix for electricity and heat production, input fuel prices, consumption, end-user electricity prices and electricity trades. The document also presents selected non-OECD country statistics on the main electricity and heat flows.
- *Coal Information:* provides detailed information on the past and current evolution of the world coal market. It presents country specific statistics for OECD member countries and selected non-OECD countries on coal production, demand, trade and prices.

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- *Natural Gas Information:* presents a detailed gas supply and demand balance for each individual country and for the three OECD regions (North America, Europe and Asia-Pacific), as well as a breakdown of gas consumption by end-user. Import and export data are reported by source and destination. It also contains essential information on LNG (liquefied natural gas) and pipeline trade, gas reserves, storage capacity and prices not only for the OECD countries but also for the rest of the world.
- *Oil Information:* contains key data on world production, trade, prices and consumption of major oil product groups, with time series back to the early 1970s, as well as more detailed and comprehensive picture of oil supply, demand, trade, production and consumption by end-user for each OECD country individually and for the OECD regions. Trade data are reported extensively by origin and destination.
- *Renewables Information:* presents a detailed and comprehensive picture of developments for renewable and waste energy sources for each of the OECD member countries, encompassing energy indicators, generating capacity, electricity and heat production from renewable and waste sources, as well as production and consumption of renewable and waste products. It also includes a selection of indicators for non-OECD countries.
- *CO_2 Emissions from Fuel Combustion:* provides a basis for comparative analysis of CO_2 emissions from fossil fuel combustion, a major source of anthropogenic emissions. The data cover the period from 1971 onwards for more than 140 countries and regions, by sector and by fuel. Emissions were calculated using IEA energy databases and the default methods and emissions factors from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

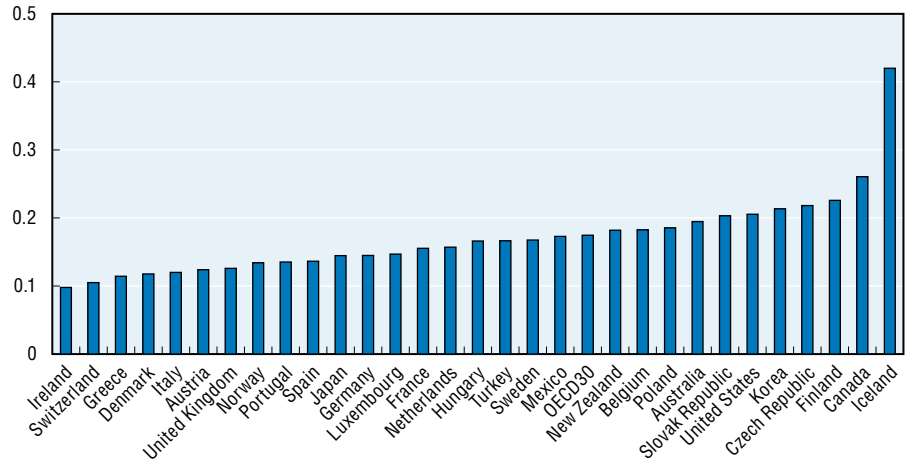
In addition, two quarterly publications are made available to users:

- *Energy Prices and Taxes:* contains up-to-date information on prices and taxes in national and international energy markets, such as import prices, industry prices and consumer prices. The statistics cover the main petroleum products, gas, coal and electricity, giving for imported products an average price both for the importing country and country of origin. Every issue includes full notes on sources and methods and a description of price mechanisms in each country.
- *Oil, Gas, Coal and Electricity:* provides quarterly statistics on oil, coal, natural gas and electricity for the OECD countries. Oil statistics cover production, trade, refinery intake and output, stock changes and consumption. Statistics for electricity, natural gas and coal show supply and trade. Import and export data are reported by origin and destination.

Monthly oil and gas data services are also available on the Internet. The IEA Monthly Oil Data Service comprises the detailed databases of historical and projected information used in preparing the IEA's monthly Oil Market Report. The databases include supply, demand, balances, stocks, trade and field-by-field supply. The IEA Monthly Gas Data Service provides historical and current data on natural gas supply and demand for OECD countries, as well as detailed information on trade origins and destinations.

Figure 4.2.1 – **Total primary energy supply per unit of GDP**

Tonnes of oil equivalent (toe) per thousand 2000 US dollars of GDP calculated using PPPs, 2007

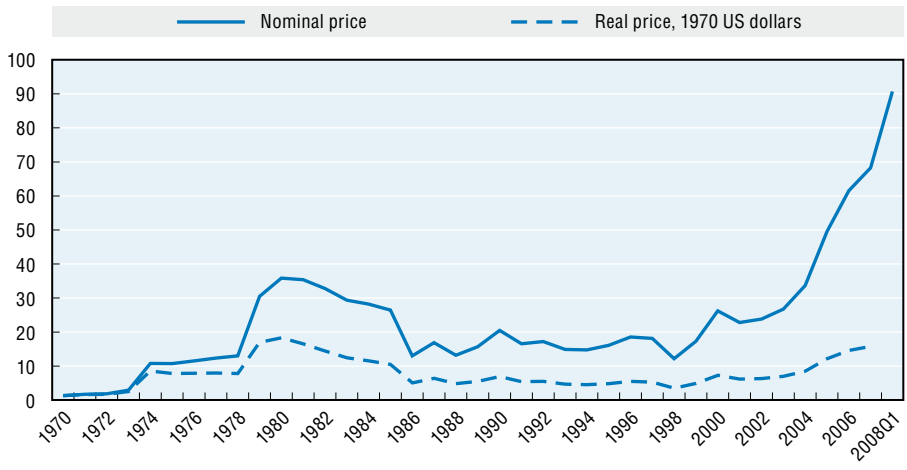


StatLink http://dx.doi.org/10.1787/335436184341

Sources: IEA (2007), *Energy Balances of OECD Countries*, IEA.

Figure 4.2.2 – **Crude oil spot prices**

US dollars per barrel



StatLink http://dx.doi.org/10.1787/335440844175

Sources: IEA (2007), *Energy Prices and Taxes*, IEA.

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Further information

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IEA (2007), *Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency*, IEA.
IEA (2007), *Natural Gas Market Review 2007: Security in a Globalising Market to 2015*, IEA.
IEA (2007), *World Energy Outlook 2007: China and India Insights*, IEA.

Online databases

Energy Prices and Taxes.
World Energy Statistics and Balances.

Websites

www.iea.org

4.3 Industry and services statistics

This section describes statistics used for the structural and sectoral analyses of business behaviour in the industrial and services sectors. In particular, it presents data concerning: business demography (*i.g.* the creation and destruction of enterprises); structural business statistics by size-class; statistics concerning two specific economic sectors that provide financial services (insurance and pension funds); and indicators tracking the impact of regulatory reforms on the market efficiency of industrial and services activities.

Compared to other domains of economic statistics, the collection of these data is relatively recent and therefore their international comparability is still an issue. Moreover, the differences in laws and institutional frameworks make the production of internationally harmonised statistics extremely difficult (for example, the legal definition of an enterprise depends on national legislation, as well as the registration of its birth or death). Nevertheless, with the growing importance of structural economic policies and policies aimed at fostering economic and employment growth, policy makers and analysts are paying growing attention to these data, and statisticians are making efforts to improve the timeliness and comparability of business statistics.

Business demography

The creation of new businesses and the decline of unproductive ones are often regarded as key to business dynamism in OECD economies. Understanding business behaviour and "creative destruction" (in the Schumpeterian sense), and identifying successful and failing businesses, as well as fostering entrepreneurship and innovation have become increasingly important objectives for policy makers in many OECD economies in recent years. Business churn (i.e. entry plus exit rates) is commonly viewed as a measure of the ability of economies to expand the boundaries of economic activity, to shift resources towards growing areas and away from declining areas, and to adjust the structure of production to meet consumers' changing needs. Moreover, higher rates of business creation and churning are generally held to benefit economic growth, job creation and poverty alleviation via increased productivity and innovation.

Many national statistical offices now provide official statistics on the exit, entry and turnover of businesses. Eurostat has recently developed an enterprise demography database typically using data sourced from business registers or administrative tax sources, which has greatly improved the comparability of business demography data from European countries.

Since comparison of these statistics across non-EU countries is a more complex undertaking the OECD Statistics Directorate has recently developed a framework that provides definitions for a number of key business demography indicators and which has served as the basis of a joint Emostat-OECD *Manual on Business Demography Statistics*. To improve international comparability this framework now forms the basis for formal data collection from OECD countries. However, the data presented below were produced by NSOs prior to adoption of this framework, so differences remain.

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▶ Key definitions

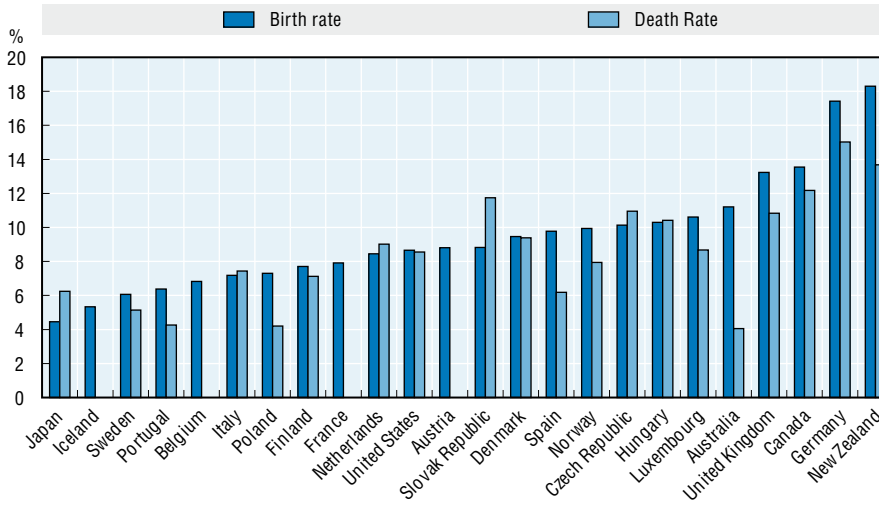
Enterprise: is a legal entity possessing the right to conduct business on its own. It may consist of one or more local units or establishments corresponding to production units situated in a geographically separate place and in which one or more persons are employed

Number of employees: includes all persons, covered by a contractual arrangement, who receive compensation for their work, whether full-time or part-time. It excludes working proprietors, active business partners, unpaid family workers and home-workers, irrespective of whether or not they are on the payroll.

Employer enterprise birth: occurs when an enterprise records employees greater than zero for the first time. The corollary to a birth is an **employer enterprise death**, which occurs when a business that previously had one or more employees and ceases to trade or have employees.

Figure 4.3.1 – **Birth and death rates**

As a percentage of total number of enterprises, 2003 or latest available year



StatLink http://dx.doi.org/10.1787/335467001810

Source: OECD (2006), *Structural and Demographic Business Statistics*, OECD Publishing.

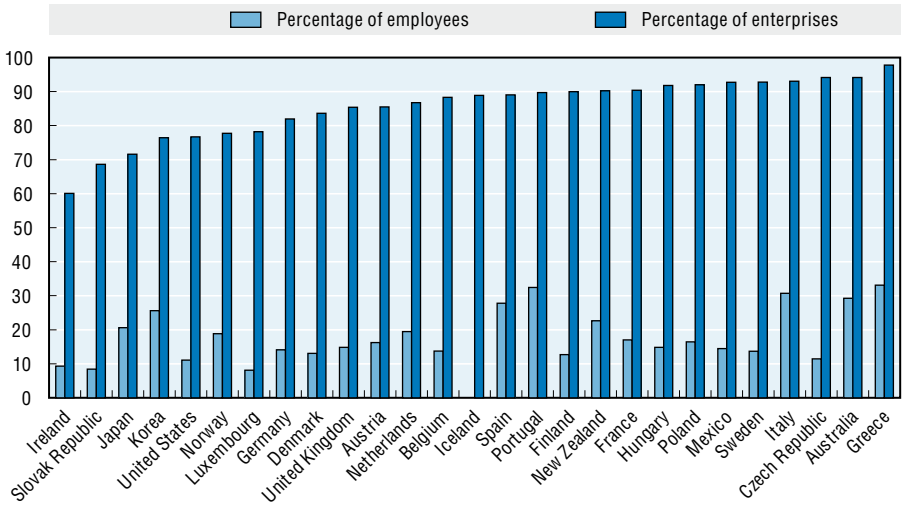
Enterprises by size classes

Statistics showing the distribution of enterprises by size class help to analyse the potential, and actual, contribution of small enterprises to economic growth. Potential, because the data used here cannot show the contribution small enterprises make to economic and employment growth over time as they move from the start-up phase to some optimal size. Still, many studies have used longitudinal datasets to establish their important contribution in this context.

Unfortunately, the international comparability of enterprise statistics is still an issue. A majority of OECD countries presents business statistics using the enterprise as the statistical unit, while others (Japan, Korea and Mexico) use the concept of establishment. However, because most enterprises are also establishments, this is not expected to significantly affect comparability. An area where considerable differences do arise, however, is the coverage of businesses. In many countries, this information is based on business registers and economic censuses or surveys whose coverage of businesses varies across countries depending on the administrative thresholds, registration requirements, tax legislation and permissible business burdens in place. For example, US data reflects only businesses with employees. For Ireland and Korea, only businesses with more than three or more than four employees, respectively, are represented.

Figure 4.3.2 – **Enterprises with less than 20 persons engaged**

As a percentage of total number of employees or total number of enterprises
2005 or latest available year



StatLink http://dx.doi.org/10.1787/335488876826

Source: OECD (2005), *OECD SME and Entrepreneurship Outlook*, OECD Publishing.

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Entrepreneurship indicators

Internationally comparable measures of the amount and type of entrepreneurship, as well as the key determinants of entrepreneurship, represent an important new area of statistical activity. Several indicators of overall entrepreneurship levels, based on measures of self-employment or firm creation, exist but harmonisation of definitions is required to make them comparable. Furthermore, policy makers wish to focus on the subset of entrepreneurs that create high-growth, innovative firms.

New data collections based on framework and definitions developed by the OECD-Eurostat Entrepreneurship Indicators Program (EIP) have been recently initiated to produce the information required by policy makers.

Insurance

Since 1982, the OECD has collected and analysed various insurance statistics. The data are reported on a yearly basis from all the OECD governments' relevant authorities. The set of statistics and indicators contains not only general information on insurance activities (number of companies, number of employees, gross premiums, net premiums, etc.), but also data related to major trends of the international insurance industry, such as the market share by foreign companies in each country, business written abroad, premiums in terms of risk destination (foreign or domestic risks), foreign and domestic investments. The scope of the datasets also includes gross claims payments, gross operating expenses and commissions.

▶ Key definitions

Total gross premiums: represent total insurance premiums written in the reporting country. It is a major indicator of the importance of the insurance industry in the economy of each country.

Market share in the OECD: measures the importance of the national insurance market of each OECD country compared to the whole OECD insurance market, based on total gross premiums.

Density of insurance industry: the ratio of direct gross premiums to the population. It represents the average insurance spending per capita in a given country.

Penetration of insurance industry: the ratio of direct gross premiums to gross domestic product. It represents the relative importance of the insurance industry in the domestic economy.

Life insurance share: the ratio of gross life insurance premiums to total gross premiums. It measures the relative importance of life insurance as compared to non-life insurance.

Premiums per employee: ratio of the direct gross premiums to the number of employees in insurance companies. It is an indicator of the relative efficiency of the national insurance industry.

Retention ratio: the ratio of net written premiums to total gross premiums. It represents the proportion of retained business, and thus, indirectly, the importance of reinsurance for domestic insurance companies.

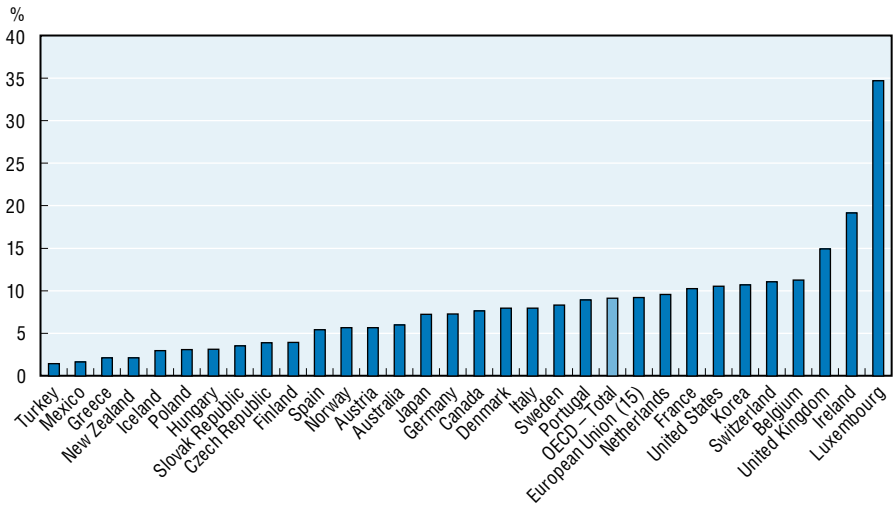
Ratio of reinsurance accepted: ratio of reinsurance accepted to total gross premiums. It provides an indication of the significance of reinsurance accepted in the national insurance market.

Foreign companies' market share in the domestic market: this figure describes the importance of foreign companies in the domestic insurance market and is measured through the following indicators:

a) market share of foreign-controlled companies and branches and agencies of foreign companies in total gross premiums;

b) market share of branches and agencies of foreign companies in total gross premiums.

Figure 4.3.3 – **Penetration of insurance industry**
2005 or latest available year



StatLink http://dx.doi.org/10.1787/335503632317

Sources: OECD (2007), *Insurance Statistics Yearbook, 1996-2005*, OECD Publishing.

Funded pensions

Recent years have witnessed intense pension reform efforts in OECD countries, which have often involved an increased use of funded pension programmes managed by the private sector. There is a growing need among policy makers and the regulatory community, as well as among private-sector participants, to compare their programme developments and experiences with those of other countries. Because funded arrangements are likely to play an increasingly important role in delivering retirement income security in many countries, and because the investment

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of pension assets will increasingly affect securities markets in future years, an accurate, comprehensive, comparable and up-to-date body of international statistics is a necessary tool for policy makers, regulators and market participants.

In 2002, the OECD launched the Global Pension Statistics project (GPS), which intends to provide a valuable means of measuring and monitoring the pensions industry, and permit inter-country comparisons of current statistics and indicators on key aspects of retirement systems across OECD and non-OECD countries. Data are collected on a yearly basis so that trends can be readily analysed.

The statistics cover an extensive range of variables (assets, asset allocation, liabilities, contributions, benefits, members) and include funded pension plans for both public and private sector workers according to the OECD classification (see the Glossary available at *www.oecd.org/dataoecd/0/49/38356329.pdf*).

Following this classification, data are split between different financing vehicles (*i.e.* autonomous pension funds, book reserves, pension insurance contracts and investment companies/banks managed funds) and different pension plan types (*i.e.* occupational vs. personal pension plans, defined benefit vs. defined contribution plans).

▶ Key definitions

Pension fund assets as a share of GDP: the ratio of the absolute size of total investments to gross domestic product. It represents the importance of private pensions relative to the size of the economy. It also gives an indication of the maturity of the system.

Pension fund asset allocation: asset allocation data can be used to assess the extent of diversification of investments and the degree of matching of liabilities. Investment products are cash and deposits, bills and bonds issued in public and private sectors, loans, shares, lands and buildings, mutual funds, unallocated insurance contracts, private investment funds and other investments.

Active members as a percentage of the working population: ratio of the total number of active members of pension funds to the working population (total civilian employment).

Total members by type of status: the proportion of active and passive members in the total number of pension fund members. This allows calculation of the dependency ratio given by the ratio of active to passive members.

Contribution as a percentage of GDP: the ratio of total pension fund contributions to gross domestic product. It is an indicator of the rate of contribution to pension funds in each country, or "gross pension saving rate".

Total contributions by type of status: the proportion of payments made to pension plans by employers and employees in the total payments made to pension funds.

Benefits as a percentage of GDP: an indicator of economic output dedicated to paying pension fund benefits. It can be compared with public pension expenditure.

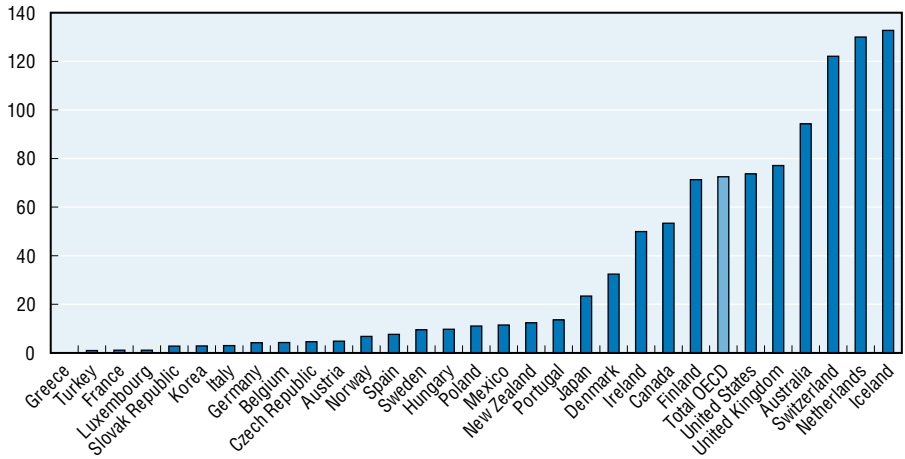
Average annual private retirement pension: an indicator of the benefits per person, calculated as a percentage of average salary. This ratio cannot be taken as a proxy of the quasi-replacement rate because benefits can be paid as lump sums

to the individual or paid out from the pension fund to an insurance company in order to be transformed into annuities.

Assets by type of plans: total assets breakdown by occupational and personal plans; defined benefit vs. defined contribution plans.

Figure 4.3.4 – **Importance of pension funds relative to the size of the economy in OECD countries**

As percentage of GDP, 2006



StatLink http://dx.doi.org/10.1787/335513821448

Sources: OECD (2006), *Pension Market in Focus, October 2006, Issue 3*, *http://www.oecd.org/daf/pensions/pensionmarkets*

Bank profitability

To assess the changes in the state of the health of national banking systems of OECD countries and to be able to determine their operating performance, policy makers, business managers, investors, lenders and analysts need detailed information on the financial statements of banks and on national financial systems. Statistics on bank profitability provide long basic data on the income statement and the balance sheet of a number of bank groupings in the OECD countries, as well as a number of financial ratios based on selected financial statement items over several years, so that comparisons between countries are made and important trends are spotted. This source also gives structural information of a general nature on the national financial systems and some additional data classified according to residence and currency (domestic or foreign).

Because of some differences in the structural and regulatory features of national banking systems, specific accounting rules and practices and various reporting methods, the statistics are not integrated in the System of National Accounts. However, they are based on a standard framework in which national data are grouped and/or re-classified.

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▶ Key definitions

Bank groupings: institutions that conduct ordinary banking business, such as commercial banks, savings banks and co-operative banks; *i.e.* institutions that primarily take deposits from the public at large and provide financing for a wide range of purposes.

Income statement: otherwise known as a profit and loss statement, it is one of the major financial statements that all banks are required to prepare annually. It provides a record of an institution's revenues and expenses for a given period of time, and thus serves as the basic measuring stick of profitability.

Balance sheet: also known as the statement of financial position, it is a snapshot of a bank's financial condition at a single point in time. It presents a summary listing of the institution's assets, liabilities and owners' equity.

The OECD Product Market Regulation Database

The Product Market Regulation (PMR) Database contains a comprehensive and internationally comparable set of indicators about the state of regulation and market structures in OECD countries on the economy-wide and sectoral level. The term "regulation" here covers the diverse set of instruments by which governments impose requirements on enterprises and citizens, including laws, formal and informal orders, subordinate rules, administrative formalities and rules issued by non-governmental or self-regulatory bodies which have been delegated regulatory power by the government. Therefore, the PMR indicators measure the extent to which policy settings promote or inhibit competition in areas of the product market where competition is viable. The main sources of information used to construct the PMR indicators are the responses of OECD Member governments to the Regulatory Indicators Questionnaire and data published by the OECD and other international organisations.

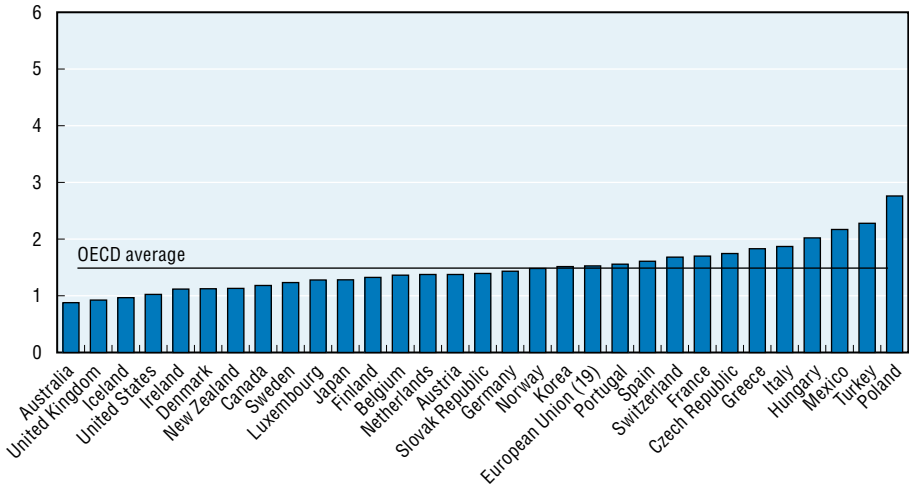
The indicators included in the PMR indicator system are:

- **Indicators of economy wide regulation:** the indicators of product market regulation (PMR) are economy wide indicators of policy regimes in OECD countries and have been estimated for 1998 and 2003. These indicators summarise a wide array of different regulatory provisions across OECD countries.
- **Indicators of regulation in professional services:** the professional services indicators cover entry and conduct regulations in the legal, accounting, engineering and architecture professions and have been estimated for 1996 and 2003.
- **Regulation in retail trade:** The retail indicators have been estimated for 1998 and 2003.
- **Regulation in energy, transport and communications:** the indicators summarise regulatory provisions in seven sectors: electricity, gas, post, telecom, rail, air passenger transport and road. These indicators have been estimated for 21 OECD countries for the period 1975 to 2003.

- **Regulation impact:** sectoral indicators that measure the "knock-on" effects of regulation in non-manufacturing sectors on all sectors of the economy. These indicators have been estimated for the period 1975 to 2003 for 36 sectors in 21 OECD countries.

Figure 4.3.5 – **Product market regulation**

Restrictiveness of economy-wide product market regulation, 2003
Indicator scale of 0-6 from least to most restrictive



StatLink http://dx.doi.org/10.1787/335536086876

Source: OECD (2008), *Economic Policy Reforms: Going for Growth 2008,* OECD Publishing.

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Online databases

OECD Banking Statistics
OECD Global Pension Statistics
OECD Insurance Statistics
Available at *www.sourceoecd.org/database/oecdstat*

Websites

www.oecd.org/daf/pensions/gps
www.oecd .org/eco/pmr

4.4 General government

This section illustrates statistics available to describe some of the fundamental functions carried out by governments and other public institutions. It starts with the description of general government accounts, which provide a comprehensive picture of economic and financial flows created by the public sector's activities and represent a fundamental tool to guide the fiscal and the monetary policies. More detailed statistics compiled to analyse specific activities are also presented: the social expenditure database, which provides a detailed view of the government's expenditures for pensions, health and social assistance; the databases on revenues and taxing wages, which represent a fundamental tool for analysing how the fiscal policy is financed; finally, the central government debt database, which allows detailed evaluations of the impact of the government's operations on financial markets and on the sustainability of fiscal conditions in the long run.

General government accounts

General government accounts are an elaboration of the national accounts for the general government sector and are compiled from government finance statistics in accordance with the System of National Accounts 1993 (SNA 93). The accounts are presented by sub-sector: central government, state government, local government and social security funds. Note that public enterprises are excluded since they are not part of the general government sector.

The SNA 93 recommends that transactions be recorded on an accrual basis. This means that claims and liabilities, revenues and expenditure should be recorded according to their due amounts at the time when they are due, which is not necessarily when the cash flows occur. The OECD collects general government sector data from countries in the form of three harmonised tables: "main aggregates of general government"; "detailed taxes and social contributions receipts"; and "expenditure of general government by function".

The main indicator calculated using these data is the net borrowing/net lending of general government as a percentage of GDP. For EU countries, the deficit (or surplus) is defined as the balancing item "net lending/net borrowing" as per the EU's adaptation of SNA 93, the European System of Accounts 1995. Two other indicators are also often calculated: general government total expenditure as a percentage of GDP, and general government total revenue as a percentage of GDP.

▶ Key definitions

Final consumption expenditure: consists of expenditure earmarked for the non-market production of goods and services for collective consumption (security, justice, etc.) and for individual consumption (health care, housing, education, etc.), to which must be added government expenditure to finance goods and services provided to households by market producers.

Total revenue: equal to total sales (market output and output for own final use) and payments for non-market output plus subsidies (receivable) plus property income

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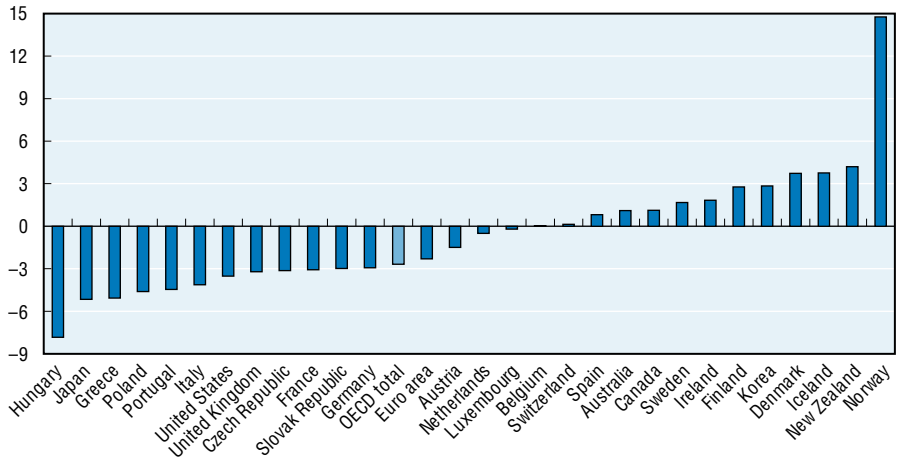
(receivable) plus total taxes (receivable) plus total social contributions (receivable) plus other current transfers and capital transfers (receivable).

Total expenditure: calculated as intermediate consumption plus compensation of employees plus subsidies (payable) plus interest (payable) plus taxes (payable) plus social benefits and social transfers in kind (via market producers) plus current transfers and capital transfers (payable) plus an adjustment for the net equity of households in pension funds reserves plus gross capital formation and net acquisition of non-financial, non-produced assets.

Net borrowing/net lending: the final balancing item of the sequence of economic, "non-financial" accounts, resulting basically from current transactions and investment (gross capital formation). It is also equal to total revenue minus total expenditure. This is the most commonly referred to aggregate. In principle, it should be equal to the balancing item of the financial account. In practice, being calculated from different accounting sources, there is always a discrepancy. For the last few years, a discrepancy has existed between this variable and the European Union's (EU) corresponding variable called "excessive deficit procedure" deficit/surplus for EU Members of the OECD. In the latter, settlements on swap transactions are recorded as property income (interest), whereas they are recorded as financial transactions in the SNA.

Figure 4.4.1 – **Government net borrowing/net lending**

As a percentage of GDP, average 2004-2006



StatLink http://dx.doi.org/10.1787/335541273454

Source: OECD (2007), *OECD Economic Outlook,* Vol. 2007/2, No. 82, OECD Publishing.

Social expenditure

In principle, the SNA93 provides a comprehensive accounting framework for social expenditure and its financing. In practice, however, the aggregate nature of data in the SNA93 proved inadequate for analysis of social policies. As a result, the *OECD*

Social Expenditure Database (SOCX) was developed in the 1990s. The database includes reliable and internationally comparable statistics on public and (mandatory and voluntary) private social expenditure at the programme level. The 2007 version also includes, for the first time, estimates of net total social spending for 24 OECD countries. SOCX provides a unique tool for monitoring trends in aggregate social expenditure and analysing changes in its composition. The main social policy areas are as follows: old age, survivors, incapacity-related benefits; health; family; active labour market programmes; unemployment; housing; and other social policy areas.

Across OECD countries, gross public social expenditure has increased from about 16% of GDP in 1980 to 21% of GDP in 2003, on average. In Sweden, public social spending is about 31% of GDP, while it is 5% to 6% of GDP in Mexico and Korea. The largest categories of social spending are pensions (7% of GDP, on average), health (6%) and income transfers to the working-age population (5%). Spending on pensions accounts for more than 12% of GDP in Austria, France, Greece, Italy and Poland, and less than 4% in Australia, Iceland, Ireland, Korea, Mexico and Turkey.

From the perspective of society, net social expenditure (i.e. after tax), from both public and private sources, gives a better indication of the total resources used to pursue social goals than simply looking at gross public spending alone. On average, total net social expenditure accounted for 23% of GDP in 2003, ranging from more than 30% in France, Germany and Sweden to less than 10% in Korea and Mexico.

If private social benefits and the impact of the tax system are also taken into account, this considerably reduces the differences in social spending-to-GDP ratios across countries. Total net social expenditures as a percentage of national income are then rather similar in Austria, Denmark, the Netherlands, Norway, the United Kingdom and the United States. However, a similar size of net social spending across countries does not imply that the degree of redistribution achieved through the tax and benefit systems is also similar.

Other OECD databases provide more detailed information about specific public expenditure programmes. For example, in the context of the Health Database, data on total expenditure on health as a percentage of GDP or per capita, as well as pharmaceutical expenditure, are available. Similarly, in the context of the Education Database, data on public and private education expenditures are available. In particular:

- *The dataset on the expenditure by funding source and transaction type* consists of data concerning all entities that provide funds for education, either initially or as final payers, that are classified as either governmental (public) sources or non-governmental (private) sources, the sole exception being "international agencies and other foreign sources", which are treated as a separate category. There are three types of financial transactions: direct expenditure on educational institutions; transfers to students or households and to other private entities; households' expenditure on education outside educational institutions.
- *The dataset on expenditure by nature and resource category* consists of data on the distribution of education expenditure by the nature of expenditure (current and capital expenditure) and service provider (public institutions, government-

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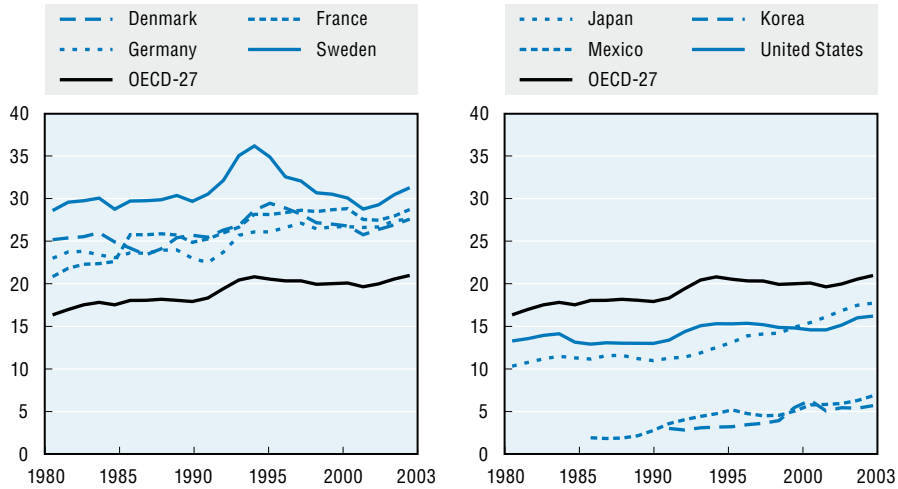
dependent private institutions, and independent private institutions, i.e. both educational and other institutions). These expenditure figures are intended to represent the total cost of services provided by each type of institution, without regard to sources of funds (whether they are public or private).

Figure 4.4.2 – **Public social spending**

Selected countries as percentage of GDP, 1980-2003



StatLink http://dx.doi.org/10.1787/335542018148

Note: Information for 1980 to 2003 is available for 22 countries, while information for the Czech Republic, Iceland, Korea, Mexico, and Poland is available from 1990 onwards. OECD-27 refers to an unweighted average of OECD countries, not including Hungary (data from 1999 onwards), Slovak Republic (data from 1995 onwards) and Turkey (no data since 2000).

Source: OECD (2007), *Social Expenditure Database 1980-2003*.

Revenue statistics

Statistics on tax revenues come from administrative sources, ultimately from tax administrations but usually transmitted through national statistical offices. Taxes are a form of payment to government but are distinguished from other payments by the fact that they are compulsory and unrequited (in the sense that the individual taxpayer does not receive something of equal value in exchange for the taxes paid). The OECD generally includes compulsory social security contributions in its measures of tax revenue because the link between an individual's contributions and benefits are not sufficiently strong to regard the contributions as requited. The OECD also includes taxes paid by government, such as social security contributions for government employees (but only if actual payments are made) and sales taxes on government purchases.

The OECD classifies taxes into six broad categories: taxes on income and profits; social security contributions; payroll taxes; property taxes; consumption taxes; other taxes. Each of these is further subdivided into more precise categories.

▶ Key definitions

Total tax to GDP ratio: provides an overall measure of the general level of taxation in the economy.

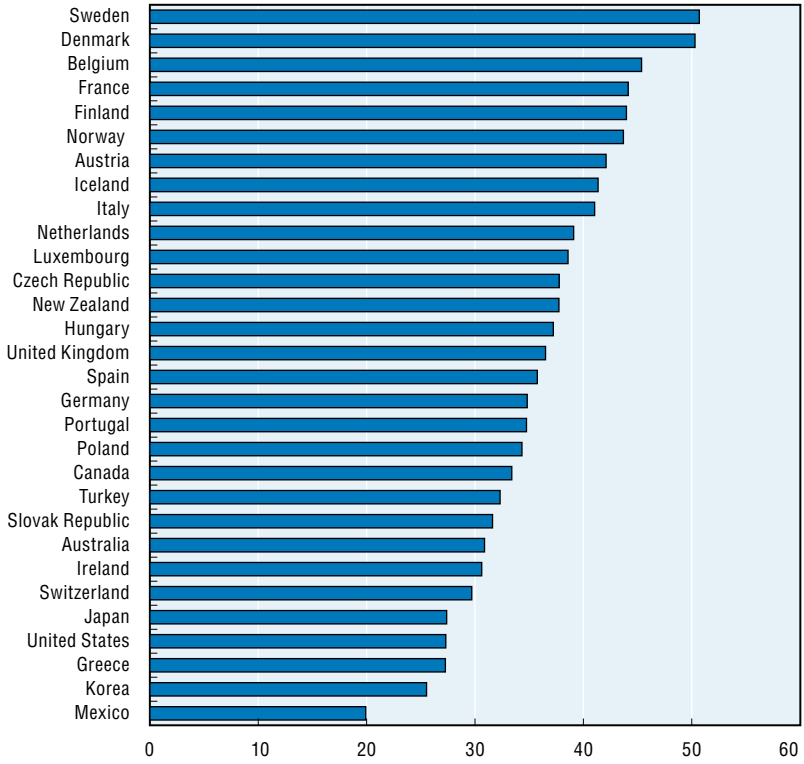
Ratios of revenues from individual taxes to GDP: provide useful detail that can be used to gauge, for example, if the impact of personal income tax is different from that of consumption taxes.

Shares of individual taxes in total tax revenue: provides an indication of the balance between different types of taxes, abstracting from differences in the overall level of tax revenues.

Shares of tax revenue by sub-sector of government: the shares that go to central government, state governments (in federal countries) and local governments provide an indication of tax revenue decentralisation.

Figure 4.4.3 – **Total tax ratio**

As percentage of GDP, 2005



StatLink http://dx.doi.org/10.1787/335555122651

Source: OECD (2007), *Revenue Statistics 1965-2006*, OECD Publishing.

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Taxing wages

The OECD's *Taxing Wages* data measure the tax burden on labour supplied by a small number of 'typical families'. The tax burden includes personal income tax, employers' and employees' social security contributions and payroll taxes. Universal family benefits paid in cash for dependent children are treated as negative taxes. The data are obtained by using the tax laws to calculate the taxes that are legally due for each family, based on its demographic composition and the earnings of its members.

There are eight household types: single individuals with no children earning 67%, 100% and 167% of average wages; a lone parent with two children earning 67% of average wages; a married couple with two children and a single earner at 100% of average wages; two-earner married couples, one partner earning 100% and the other 33% of average wages, with two children and without children; a two-earner married couple, one partner earning 100% and the other 67% of average wages, with two children.

▶ Key definitions

The tax wedge: personal income tax, social security contributions plus payroll taxes as a percentage of labour costs (the wage plus employers' social security contributions and payroll taxes). This represents the difference between the cost of labour to the employer and the amount that the worker receives after tax. The marginal rate of these taxes as labour costs increase is also calculated.

Personal tax: personal income tax and employees' social security contributions as a percentage of the wage. This represents the taxes levied directly on the worker. The marginal rate of these taxes as wages increase is also calculated.

Personal income tax: personal income tax as a percentage of the wage.

Table 4.4.1 – **Tax burden**

Income tax plus employee and employer contributions less cash benefits as a % of labour costs
Single persons without children at 100% of average earnings, 2000-2006

	2000	2001	2002	2003	2004	2005	2006
Australia	30.6	27.3	27.7	28.0	28.0	28.3	28.1
Austria	47.3	46.9	47.1	47.4	48.1	47.9	48.1
Belgium	57.1	56.7	56.3	55.7	55.4	55.4	55.4
Canada	33.2	32.0	32.1	32.0	32.0	31.9	32.1
Czech Republic	42.7	42.6	42.9	43.2	43.5	43.8	42.6
Denmark	44.3	43.6	42.6	42.6	41.3	41.1	41.3
Finland	47.8	46.4	45.9	45.0	44.5	44.6	44.1
France	49.6	49.8	49.8	49.8	49.9	50.1	50.2
Germany	54.0	53.0	53.5	54.2	53.2	52.4	52.5
Greece	38.4	38.1	37.7	37.7	39.5	40.4	41.2
Hungary	54.6	55.8	53.7	50.8	51.8	51.1	51.0
Iceland	26.1	26.9	28.4	29.2	29.4	29.0	28.6
Ireland[1]	28.9	25.8	24.5	24.2	25.0	23.5	23.1
Italy	46.4	46.0	46.0	45.0	45.4	45.4	45.2
Japan	24.8	24.9	30.5	27.4	27.3	27.7	28.8
Korea[1]	16.4	16.4	16.1	16.3	17.2	17.3	18.1
Luxembourg	38.6	37.0	34.2	34.7	35.1	35.9	36.5
Mexico	12.6	13.2	15.8	16.8	15.3	14.7	15.0
Netherlands	39.7	37.2	37.4	37.1	38.8	38.9	44.4
New Zealand	19.4	19.4	19.5	19.7	20.0	20.4	20.9
Norway	38.6	39.2	38.6	38.1	38.1	37.2	37.3
Poland	43.2	42.9	42.9	43.1	43.4	43.5	43.7
Portugal	37.3	36.4	36.6	36.8	36.8	36.3	36.3
Slovak Republic	41.8	42.8	42.5	42.9	42.5	38.3	38.5
Spain	38.6	38.8	39.1	38.5	38.7	38.9	39.1
Sweden	50.1	49.1	47.8	48.2	48.4	48.1	47.9
Switzerland	30.0	30.1	30.1	29.7	29.4	29.5	29.7
Turkey[1]	40.4	43.6	42.5	42.2	42.8	42.8	42.8
United Kingdom	32.2	31.9	32.0	33.5	33.6	33.7	33.9
United States	29.5	29.4	29.2	29.0	29.0	28.9	28.9
Unweighted average:							
OECD	37.8	37.4	37.4	37.3	37.4	37.2	37.5
EU-15	43.4	42.4	42.0	42.0	42.2	42.2	42.6
EU-19	43.8	43.2	42.8	42.7	42.9	42.6	42.9

StatLink http://dx.doi.org/10.1787/336464573762

1. Ireland, Korea and Turkey wage figures are based on the old definition of average worker (ISIC D, rev3.)

Source: OECD (2006), *Taxing Wages 2005-2006*, OECD Publishing.

Central government debt

To finance their deficits, governments issue via financial markets various debt instruments such as bonds, Treasury bills and commercial papers. Debt instruments attract both institutional and retail investors and represent an important share in the portfolios of fund managers. Raising funds through marketable instruments depends on factors like access to well-functioning primary and secondary markets (in particular market liquidity) and the presence of well-developed market segments – institutional and retail investors. The OECD Central Government Debt statistics

refer to quantitative information on marketable central government debt instruments in all OECD member countries, excluding state and local government debt and the Social Security Fund. Sources of these statistics are the debt-management offices and the central banks of OECD member countries.

Data refer to both resident and non-resident holdings. The maturity structure of the debt instruments relates to residual maturity instead of initial maturity. The method of valuation is either nominal value or market value.

▶ Key definitions

Central government: consists of the institutional units making up the central government plus those NPIs (non-profit institutions) controlled and mainly financed by central government. The political authority of central government extends over the entire economy. Central government has therefore the authority to impose taxes on all resident and non-resident units engaged in economic activities within the country.

Market value: the actual price agreed upon by buyers and sellers. Assets and liabilities are valued at the prices prevailing at the time they were recorded on the balance sheet, not at their original prices.

Nominal value: value of a security at issue.

Maturity and residual maturity: maturity is the period of time until the redemption or expiration of a financial instrument. Residual maturity is the time remaining until the expiration or the repayment of the instrument.

Central government debt as a percentage of GDP: the ratio between the central government debt and the GDP is useful for comparing the level of central government debt across OECD countries.

Government-issued bonds as a percentage of total marketable debt: the share of central government-issued bonds in the domestic market for debt instruments. Around 90% of central government borrowing requirements are met through such financing.

Marketable central government debt by type of investor: share of marketable central government debt held by residents and non-residents.

Table 4.4.2 – **Central government debt**

As a percentage of GDP, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Australia	19.1	19.7	19.0	16.0	14.1	11.7	9.8	8.9	7.8	6.9	6.5
Austria	55.9	56.6	58.7	59.4	61.4	60.4	59.7	59.9	59.9	61.1	61.4
Belgium	113.7	112.6	109.9	105.4	103.6	99.7	99.3	98.2	95.8	93.6	93.2
Canada	56.8	56.3	52.7	50.1	46.7	40.9	39.7	38.1	35.8	32.1	30.4
Czech Republic	10.5	9.4	9.4	9.9	11.2	13.5	14.9	16.4	19.3	21.4	23.6
Denmark	74.9	72.9	69.1	64.0	60.9	54.8	52.0	51.6	49.3	46.9	39.1
Finland	62.5	66.6	64.7	59.5	56.3	48.5	45.3	42.1	44.0	42.6	38.7
France	41.5	44.0	45.6	46.3	47.8	47.4	48.4	49.9	51.9	52.6	53.8
Germany	21.1	22.9	24.3	26.1	34.1	34.1	34.6	36.0	37.7	39.1	40.3
Greece	114.9	118.5	115.3	113.6	113.4	119.3	120.7	119.2	117.3	119.5	119.0
Hungary	83.7	71.0	62.4	60.7	60.0	54.5	51.5	54.5	56.8	56.8	58.5
Iceland	52.3	49.8	46.3	41.0	35.5	34.1	39.6	36.0	33.9	28.6	20.0
Ireland	72.2	64.6	57.2	47.7	44.0	35.0	30.9	27.9	27.0	25.5	23.8
Italy	113.1	113.6	111.0	108.7	106.7	103.6	102.7	99.5	96.6	96.2	98.4
Japan	65.6	69.3	77.0	88.0	97.7	106.2	123.9	137.5	141.2	156.9	163.7
Korea	8.9	8.2	10.3	14.8	16.9	17.4	18.2	18.5	21.9	25.2	29.6
Luxembourg	2.6	3.4	3.7	4.1	3.5	3.2	3.1	2.7	1.7	1.5	0.9
Mexico	40.8	31.1	25.7	27.8	25.6	23.2	22.5	24.0	24.2	23.0	22.4
Netherlands	57.1	56.1	53.0	51.1	48.8	43.9	41.3	41.5	43.0	44.0	42.8
New Zealand	49.7	42.7	36.7	38.4	35.5	32.6	30.4	28.8	27.0	24.2	22.7
Norway	31.0	27.7	24.9	22.4	21.0	19.5	18.3	19.2	21.6	18.7	17.5
Poland	49.6	43.9	43.0	39.5	39.7	35.8	36.4	40.6	45.0	43.7	45.0
Portugal	61.9	61.3	58.0	54.8	55.2	54.1	56.0	58.7	60.6	63.5	69.1
Slovak Republic	19.1	18.5	21.0	22.7	22.8	24.0	36.4	35.4	35.7	39.4	34.2
Spain	52.4	56.1	54.7	52.9	51.7	49.9	46.3	44.0	40.8	39.4	36.5
Sweden	76.9	79.1	75.1	73.4	65.2	58.3	50.2	48.5	49.3	48.3	48.0
Switzerland	22.1	24.2	25.5	28.1	25.7	26.0	25.3	28.4	28.5	28.4	28.5
Turkey	17.5	45.0	44.2	41.7	53.8	50.5	99.7	87.4	78.6	73.5	67.8
United Kingdom	..	..	..	50.8	45.1	43.4	39.8	40.2	39.9	41.5	45.6
United States	49.2	48.0	45.5	42.8	39.4	34.4	33.0	33.8	35.4	36.5	36.5

StatLink http://dx.doi.org/10.1787/336476116034

Source: OECD (2006), *Central Government Debt: Statistical Yearbook 1996-2005*, OECD Publishing.

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OECD (2007), *Taxing Wages 2006-2007, 2007 Edition: Special Feature: Tax reforms and tax burdens 2000-2006*, OECD Publishing.

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National Accounts of OECD Countries.
OECD Economic Outlook Statistics.
Finance, available at *www.sourceoecd.org/database/oecdstat.*
OECD Social Expenditure, available at *www.sourceoecd.org/database/oecdstat.*
OECD Tax Statistics (Revenue Statistics and Taxing Wages).

Websites

www.oecd.org/eco/sources-and-methods
www.oecd.org/ctp/taxingwages
www.oecd.org/els/social/expenditure
www.oecd.org/std/finance

4.5 Science, technology and innovation

Over the last 20 years, the OECD has been extremely active in developing statistical standards in the area of science, technology and innovation. Through its working groups, the Organisation has co-ordinated the development of several handbooks, widely used in all continents by national statistical offices and other government agencies, and data collection on very innovative and policy relevant issues. This section provides an overview of areas for which developmental and data collection work started several years ago (research and development statistics, innovation statistics, ICT statistics) and areas where the work was launched more recently or is still in an exploratory phase (biotechnology and patents).

Research and development

Since research and experimental development (R&D) and innovation are increasingly recognised as key elements of the knowledge-based economy, the collection of reliable and comparable statistics to monitor the R&D efforts of countries and firms is of crucial importance. Statistics on R&D have been collected in OECD countries since the 1960s. They are used to measure inputs into the innovation process in terms of expenditure and personnel.

The collection of these statistics has been guided by the OECD *Frascati Manual*, which was first published in 1963 and is currently in its 6th edition (OECD, 2002). The *Frascati Manual* has become a worldwide standard for R&D surveys and is part of a wider family of methodological manuals covering a wide range of science and technology indicators, including manuals on R&D (*Frascati Manual*), innovation (*Oslo Manual*), human resources (*Canberra Manual*), and the technological balance of payments and patents.

R&D is defined as "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications". The term R&D covers the following three activities:

- *Basic research:* experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts;
- *Applied research:* original investigation undertaken in order to acquire new knowledge, but directed primarily towards a specific practical aim or objective; and
- *Experimental development:* systematic work drawing on existing knowledge gained from research and/or practical experience which is directed to producing new materials, products or devices, to installing new processes, systems or services, or to improving substantially those already produced or installed.

The basic measure used is *intramural expenditure*, which refers to all expenditure for R&D performed within a statistical unit or sector of the economy. A secondary measure used is *extramural expenditure* which covers payment for R&D performed

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outside the statistical unit or sector of the economy. Both current costs and capital expenditure are included, while depreciation costs are excluded. In the case of the government sector, expenditures refer to *direct* rather than indirect expenditure, so for example, R&D tax credits are excluded.

In order to avoid double-counting, R&D surveys generally trace the flows of funds based on replies from R&D *performers* instead of relying on the sources of the funds, although in some cases, funder-based measures are used (for example, government R&D budgets). For international and temporal comparisons the *Frascati Manual* recommends using purchasing power parities (PPP) and the implicit gross domestic product (GDP) deflator, although it is recognized that these reflect the opportunity cost of the resources involved rather than the "real" amounts. Since the latest revision of the System of National Accounts (SNA 93) recommends that R&D be treated as capital formation (and no longer as current expenditure), capital measures for R&D (including R&D deflators and depreciation) are currently being constructed in many countries, although these are usually outside the scope of R&D surveys.

In addition to expenditure data, personnel data are used to measure the resources that go directly into R&D activities, although it is sometimes difficult to isolate the R&D activities of ancillary staff from those of other R&D staff. Three main approaches are used in the measurement of R&D personnel: headcounts; R&D activities in full-time equivalents; and the characteristics of personnel. Headcount data allow simple linkages with other series, such as education or employment data, or results from population censuses. Such data (with a breakdown by gender, age or nationality) are used for analytical studies and can support labour or education policies. Headcount data refer to the number of persons engaged in R&D at a given date (e.g. end of the calendar period), or to the average number of persons employed during the calendar year, or the total number of persons employed during that year.

Full-time equivalence (FTE) data constitute a preferred measure for assessing the volume of R&D performed in a country. R&D may sometimes be the primary function of some employees (e.g. a researcher in an R&D lab), while for others it could be a secondary activity (e.g. members of a design and testing establishment), or a part-time activity (e.g. university teachers or post-graduate students). To count only persons whose primary function is R&D would result in an under-estimate of true R&D efforts, while a headcount of all of those undertaking some type of R&D activity would result in an over-estimate. This is why FTE data is preferred for certain types of analysis. One FTE corresponds to one person-year; therefore, a person working 30% of his/her time on R&D would be counted as 0.3 FTE. In some cases, it may be more practical to survey the FTE of R&D personnel as of a specific date, but if there are significant seasonal variations, allowance should be made for this and data adjusted for a full year. Countries use different adjustment methods, such as R&D coefficients, to identify and allocate the R&D content of the work of various persons and produce aggregate figures.

In terms of the *characteristics* of R&D personnel, the *Frascati Manual* recommends that gender and age be collected, and to the extent possible, occupation and qualification, as well as region.

▶ Key definitions

Gross domestic expenditure on R&D (GERD): total intramural expenditure on R&D performed on the national territory during a given period. Similar measures are BERD (for R&D performed in the business sector), HERD (in the higher education sector) and GOVERD (in the Government sector).

Gross national expenditure on R&D (GNERD): total expenditure on R&D financed by a country's institutions during a given period. This includes R&D performed abroad but financed nationally and excludes R&D performed within a country but funded from abroad.

Government Budget Appropriations or Outlays for R&D (GBAORD): covers the budgets of central or federal government as well as those of provincial or state governments when these are significant, but excludes local government funds. It includes all government-funded R&D regardless of the sector of performance.

R&D intensity: measured by the ratio GERD/GDP.

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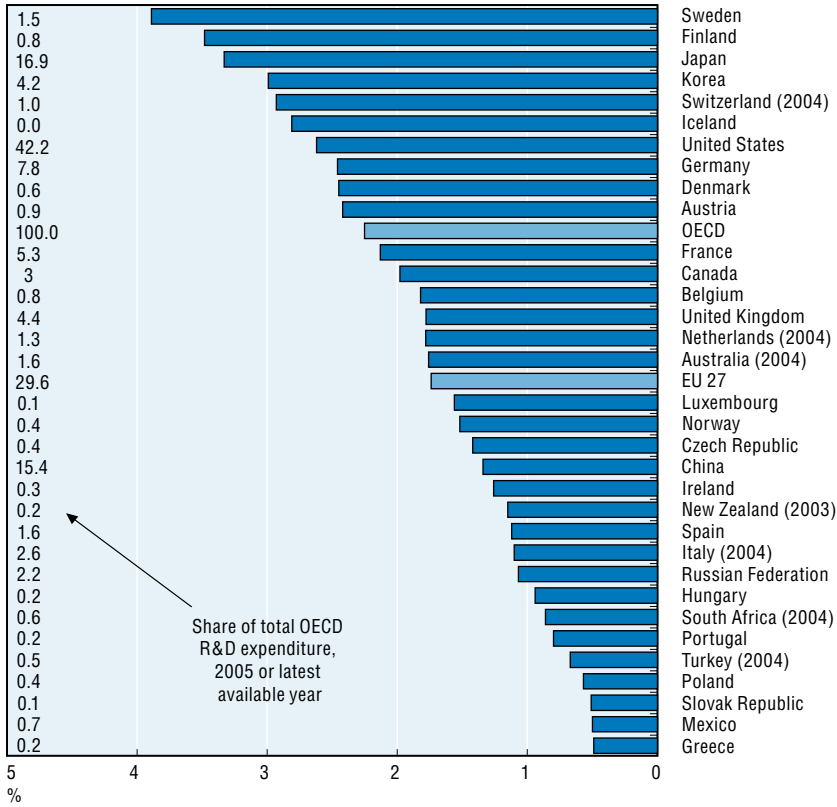
Figure 4.5.1 – **R&D intensity**

Gross domestic expenditure on R&D as a percentage of GDP, 2005 or latest available year



StatLink http://dx.doi.org/10.1787/335582876018

Sources: OECD (2007), *Main Science & Technology Indicators 2007/1*, OECD Publishing.

Innovation

It has been long understood that the generation, exploitation and diffusion of knowledge are fundamental to economic growth, development and the well being of nations. Central to this is the need for reliable statistical measures of *innovation*. During the 1980s and 1990s, a considerable body of work was undertaken to develop models and analytical frameworks for the study of innovation. This led to the development of the *Oslo Manual*, the first edition of which was published in 1992 and focused on technological product and process (TPP) innovation in the manufacturing sector. The goal of the *Manual* has been to provide a harmonized set of concepts and tools for countries to develop their own innovation surveys in a comparable way. This became the reference for many large-scale surveys examining the nature and

impacts of innovation in the business sector, in particular the European Community Innovation Survey (CIS), which was first undertaken in 1992.

The framework of the Oslo Manual has continued evolving. Its scope has been extended to better analyse innovation in the service sectors, as well as to "non-technological" innovation, and the latest edition includes an annex on innovation surveys in developing countries. The Manual proposes to follow the "subject" approach, which considers the firm as the central point and explores the various factors influencing its innovative behaviour (strategies, incentives, barriers, etc.) This is in contrast with "object"-based approaches that focus on measuring and characterizing individual innovations. The framework used in the Manual attempts to integrate insights from various schools of economic theory, ranging from the Schumpeterian "creative destruction" model centered on the firm to systemic approaches that focus on dynamic links in the innovation process.

The latest edition of the Oslo Manual defines an *innovation* as: "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organisation or external relations". Innovation activities include all scientific, technological, organizational, financial and commercial steps that actually lead, or are intended to lead, to the *implementation* of innovations. Four types of innovations are distinguished: product, process, marketing and organizational.

When collecting data on innovations, the Oslo Manual recommends an observation period of 1-3 years, *i.e.* a firm will be considered a product innovator if it implements at least one innovation during the observation period. In order to measure an innovation's degree of novelty, the Manual also recommends distinguishing between innovations that are new to the firm, new to the market, and if possible, new to the world.

Several indicators can be calculated using, for example: the number of firms having introduced a product/process innovation, or a marketing/organizational innovation (as a percentage of innovative firms, or as a percentage of all firms); the expenditure on innovation by type of activity (intramural/extramural R&D, acquisition of machinery, training, etc.); the sources of knowledge and types of linkages (internal or external; open sources vs. acquisition vs. cooperation); the share of turnover from new-to-market product innovations; the impact of process innovation on costs; and the relative importance of different types of factors (cost, knowledge, market, institutional) for both innovators and non-innovators.

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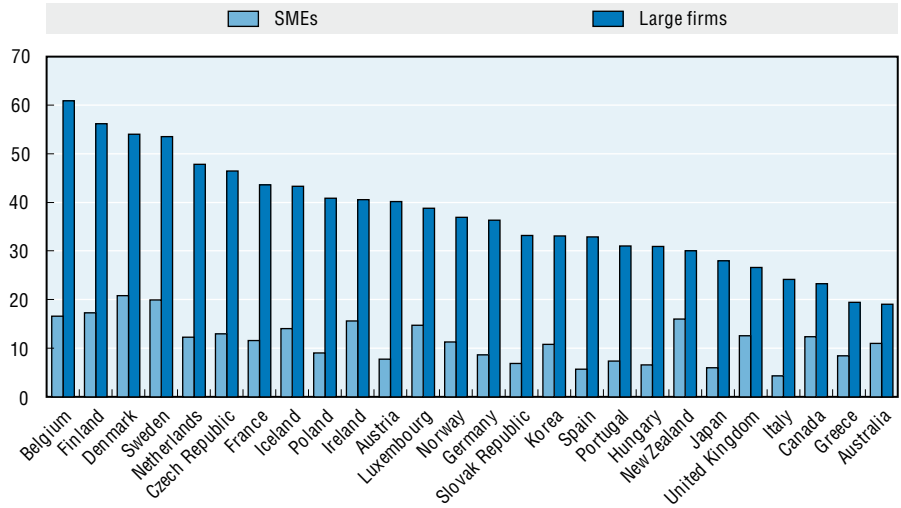
Figure 4.5.2 – **Firms collaborating in innovation activities, by size**

As a percentage of all firms, 2004 or latest available year



StatLink http://dx.doi.org/10.1787/335587016652

Sources: OECD (2007), *Science, Technology and Industry: Scoreboard 2007*, OECD Publishing.

Information and communication technology

For more than a decade, information and communication technology (ICT) has promoted profound economic and social change. The need for statistics and analysis to support and inform policy making in this area has grown in parallel. Since 1997, the OECD has been working to establish a set of definitions and methodologies that facilitate the compilation of internationally comparable data for measuring various aspects of the information society, the information economy and electronic commerce. Data for the ICT sector and other related phenomena are gradually becoming available for a growing number of countries, but the available time series are relatively short.

Correct measurement of ICT investment is crucial for estimating the contribution of ICT to economic growth and performance. Data availability and measurement of ICT investment based on national accounts (SNA93) vary considerably across OECD countries. In particular, it is only very recently that expenditure on software has been treated as capital expenditure in the national accounts, and methodologies still vary considerably across countries. To tackle the specific problems relating to software in the context of the SNA93 revision of the national accounts, OECD and Eurostat have jointly developed recommendations concerning the capitalisation of software. These are now being implemented by OECD countries.

A classification of ICT sector and products has also been developed to facilitate the construction of internationally comparable indicators on ICT consumption,

investment, trade and production. As far as ICT infrastructure is concerned, data cover areas such as telecommunication network, broadband diffusion, Internet network and traffic exchange, access to communication services and their quality, as well as tariffs.

One of the more important areas of OECD work is the development of statistical standards for measuring ICT use by businesses, households and individuals. In 2006, the OECD model survey on ICT use by business was revised to provide guidance for the collection of statistics on business use of ICT, including e-business and e-commerce, as well as the incentives and barriers to their adoption. Similarly, the OECD model survey on ICT usage in households and by individuals is intended to provide guidance for the measurement of ICT usage (including Internet use and Internet commerce) and barriers to ICT use by households and individuals. OECD countries are encouraged to use both models as a core part of their survey development in order to improve the international comparability of information collected and compiled on these topics.

▶ Key definitions

ICT sector: a combination of manufacturing and services industries whose products capture, transmit or display data and information electronically. The definition, originally based on the ISIC Rev. 3 industry classification, has just been revised according to ISIC Rev. 4.

ICT products: the guiding principles for defining ICT products are based on those for the ICT sector. However, ICT sector and ICT products are not in a one-to-one relationship: some enterprises classified to the ICT sector do not only produce ICT goods; conversely, ICT goods can originate from non-ICT industries.

ICT skills: although there is not any commonly adopted definition of ICT skills and there is no internationally agreed list of ICT related occupations, the OECD has adopted, as interim solution, a narrow and a broad definition of ICT-skilled employment, which includes ICT specialists, who have the capabilities to develop, operate and maintain ICT systems. In addition to ICT specialists, the broader definition comprises also advanced and basic users, for whom ICTs are not their main job but a tool.

E-commerce transactions: sale or purchase of goods or services, whether between businesses, households, individuals, governments and other public or private organisations, conducted over computer-mediated networks. The goods and services are ordered over those networks, but the payment and the ultimate delivery of the good or service may be conducted on or offline.

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Table 4.5.1 – Percentage of enterprises' total turnover from e-commerce
2003-2006[1, 2]

	2003	2004	2005	2006
Ireland	16.6	18.3	20.2	16.7
Denmark	7.5	12.2	..	17.5
United Kingdom	11.9	14.3	15.6	17.4
France	..	..	..	16.7
Norway	6.2	7.5	14.7	13.9
Finland[3]	10.6	12.7	14.2	14.3
Germany	..	11.3	13.0	13.9
Sweden	12.3	..	..	13.6
Austria	6.3	6.8	7.0	9.9
Belgium	7.0	6.5	8.8	7.9
Czech Republic	5.7	5.9	8.4	7.1
Portugal	1.6	4.9	..	8.2
Iceland	5.9	..	..	8.0
Hungary	..	..	..	7.0
Spain	2.1	2.9	2.7	6.9
Poland	..	2.8	4.4	5.9
Italy	1.9	3.4	2.1	2.0
Greece	0.9	1.6	2.1	2.8

StatLink http://dx.doi.org/10.1787/336568367287

1. Enterprises in the following industries are included: Manufacturing, construction, wholesale and retail, hotels and restaurants, transport, storage & communication, real estate, renting and business activities, and other community, social and personal service activities.
2. Total sales via Internet or other networks during reference year, excluding VAT.
3. For 2006, networks other than Internet: only EDI.

Source: Eurostat, *Community Survey on ICT usage in enterprises*, April 2007

Measuring the information society

The last two decades have witnessed the widespread adoption of a great number of ICT technologies, notably the personal computer, the cell phone and the Internet. ICT permeates every aspect of life – economic, social, political, cultural and otherwise – and has created great interest regarding its actual and potential impact.

The OECD's Guide to Measuring the Information Society proposes a comprehensive conceptual model for information society statistics. In particular, it considers three features:

- **E-readiness:** preparing the technical, economic and social infrastructures necessary to support ICT. E-readiness indicators allow each country to construct a statistical picture of the state of readiness of the infrastructure necessary to engage in ICT-activities. Indicators of e-readiness include: access to computers and the Internet; telecommunication networks (fixed channels, mobile, DSL and cable) and prices; investment in ICT equipment and software; ICT occupations and skills; ICT-related patents and R&D.
- **E-intensity:** the state of ICT use, volume, value and nature of the transactions. E-intensity indicators permit countries to profile who is exploiting ICT possibilities and who is not, and to identify leading sectors and applications. Internet subscribers, Internet hosts and domain names, Internet use by households and individuals; e-business; value of e-commerce sales are part of the e-intensity statistics.
- **E-impact:** Policy makers need statistics to evaluate whether, and to what extent, ICT makes a difference in terms of efficiency and the creation of new sources of wealth. Macro-economic indicators measure the contribution of the ICT sector to growth in GDP, trade and employment. Several OECD projects have generated estimates for the impact of ICT investment on labour productivity and ICT diffusion on multi-factor productivity (MFP) growth. New statistical work is currently ongoing to measure the social impact of ICT, particularly through e-health, e-training, e-government and e-crime.

Biotechnology

Biotechnology consists of a collection of related technologies with pervasive applications in many different economic sectors, including agriculture, forestry, aquaculture, mining, petroleum refining, environmental remediation, human and animal health, food processing, chemicals, security systems, and many different industrial processes. It is precisely the range of current and potential applications of biotechnology, together with their economic, environmental and social impacts, that creates a policy interest in creating high-quality economic and innovation indicators for biotechnology.

However, unlike ICT or other technologies, biotechnology lacks a core "sector" that can be quickly identified and surveyed. This has created major challenges for developing comparable biotechnology indicators (for example, national differences in the definition of biotechnology, the fields of application for biotechnology and of a biotechnology firm). To address these issues, the OECD developed a *Framework*

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for Biotechnology Statistics, which provides guidance for the collection of data on biotechnology. In particular, both a single and a list based definition of biotechnology have been developed. The single definition of biotechnology, deliberately broad, covers all modern biotechnology but also many traditional or borderline activities (for this reason, the single definition should always be accompanied by the list-based definition). The OECD definition of biotechnology is: the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

The OECD list-based definition of biotechnology includes seven categories, and respondents are usually given a write-in option for new biotechnologies that do not fit any of the categories. A firm that reports activity in one or more of the categories is defined as a biotechnology firm. The seven categories include: DNA/RNA, proteins and other molecules, cell and tissue culture and engineering, process biotechnology techniques, gene and RNA vectors, bioinformatics and nanobiotechnology. Most countries now use the OECD list-based definition of biotechnology or similar definitions that focus on modern biotechnologies. However, full comparability has not yet been reached, due to different methods of constructing sample frames and dealing with survey non-response. The methodological similarities and differences of the national biotechnology surveys are summarised in *OECD Biotechnology Statistics 2006*.

▶ Key definitions

Biotechnology-active firm: a firm engaged in key biotechnology activities, such as the application of at least one biotechnology technique (as defined in the OECD list-based definition of biotechnology techniques) to produce goods or services and/or the performance of biotechnology R&D. The number of biotechnology firms is the most widely available indicator, although it is not the best measure of a country's biotechnology effort, due to large differences in the size of individual firms.

Dedicated biotechnology firm: a biotechnology-active firm whose predominant activity involves the application of biotechnology techniques to produce goods or services and/or the performance of biotechnology R&D. These firms are a subset of the biotechnology active firms.

Biotechnology Research & Development: R&D into biotechnology techniques, biotechnology products or biotechnology processes, in accordance with both the OECD biotechnology definition and the Frascati Manual for the measurement of R&D.

Public sector biotechnology R&D: public R&D in biotechnology techniques, biotechnology products or biotechnology processes.

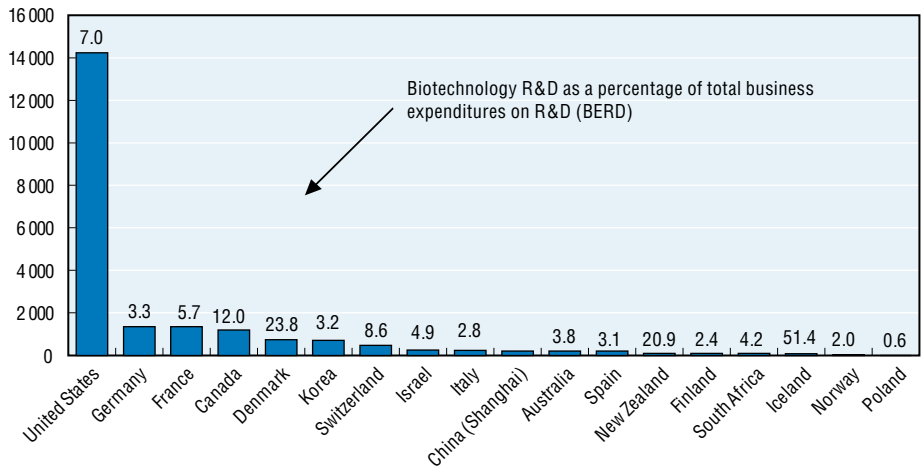
Biotechnology employment: employment involved in the generation of biotechnology products. Included are all employees that have biotechnology related responsibilities in R&D, production, administration or management.

Biotechnology sales: revenues generated from the sale (or transfer) of biotechnology products (including knowledge products). It is thus generally a subset of the total revenue earned by biotechnology firms.

Biotechnology applications: the field in which the firm applies biotechnology techniques, biotechnology products or biotechnology processes. Biotechnology has applications in many fields, including human and animal health, agriculture, fishing and forestry, food processing, industrial processing, and natural resource extraction, including energy. Although the definition of the fields of application differs across countries, it is possible to create three main fields of application that are generally comparable across countries: health, agro-food, and industrial-environmental applications. Health includes both human and animal health, agro-food includes all agricultural applications plus fishing, silviculture and food processing; and industry-environmental includes industrial processing, natural resources and environmental applications. In addition, an "other" category covers services and platform technologies, such as bioinformatics, plus other application fields not included in the three main categories in some countries.

Figure 4.5.3 – **Total expenditures on biotechnology R&D by biotechnology-active firms**

Millions of USD PPP (current), 2004 or latest available year



StatLink http://dx.doi.org/10.1787/335645331710

Source: OECD (2007), *Science, Technology and Industry: Scoreboard 2007*, OECD Publishing.

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Patents

Measuring the output and quantifying scientific and technological processes is important to the design and assessment of related policies. Statistics can help in answering fundamental policy questions, such as: "to what extent are companies inventive?" "What is the importance of international technology transfers?" or "What is the role of company networks in the innovation process?" Patents provide extremely useful information that can help answer such questions. Filing a patent means that the research project has resulted in some invention. In addition, patent documents include valuable information, like the name and address of the inventor and of the owner (usually a business or university), the technological category of the invention, the date of filing (considered to be close to the date of invention), citations to prior art (the sources of the invention), etc. In addition, patent data are available for nearly all countries in the world.

Patent databases are constituted by patent offices for the purpose of administering the patent system. They consist in millions of records, corresponding to patent applications filed each year. Hence the marginal cost for statisticians of using this data is relatively low. In addition, patent information is public, hence raising no legal obstacles to access worldwide. The value of patent data is increased when the data are cleaned and harmonized properly, so they can be readily used by statisticians.

Patent indicators need to be carefully designed and interpreted, since patents are generated by complex legal and administrative processes and are influenced by sophisticated business strategies. Failing to controlling for these factors can result in biased or meaningless statistics. For instance, it is irrelevant to compare the numbers of patents issued in two different countries, since legal criteria for issuing patents are country specific.

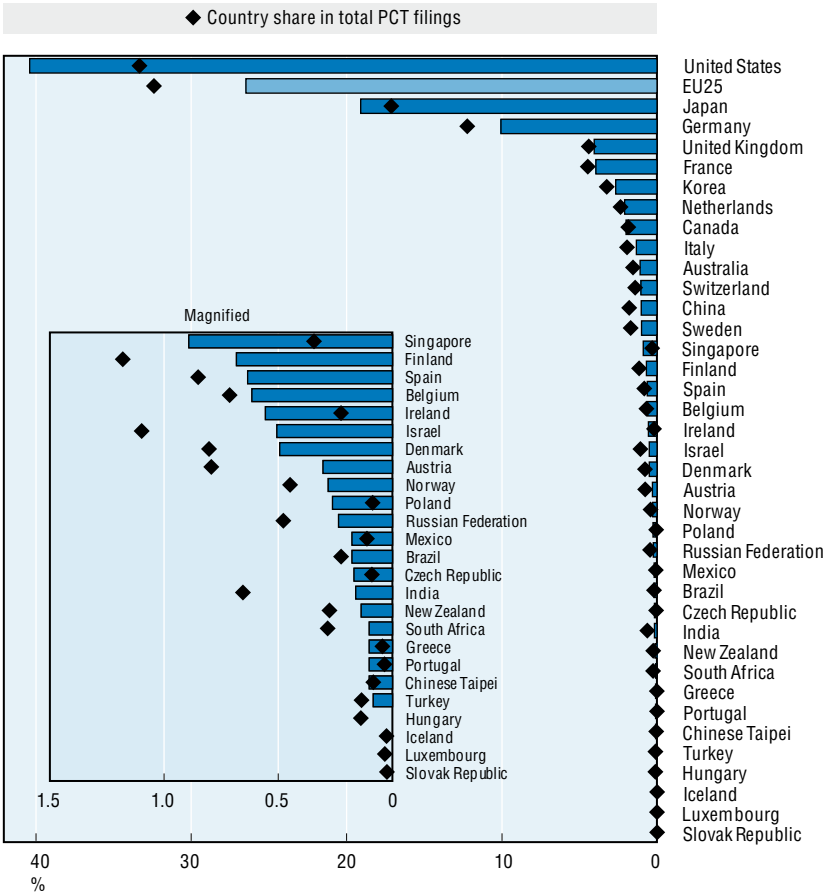
Background information on patent data and guidelines for compiling and interpreting indicators are reported in the *OECD Partent Manual* (forthcoming).

▶ Key definitions

Patent: a legal title protecting an invention, conferring to its owner the right to exclude others from using in any manner the invention without the owner's consent on a given territory. Patents are issued by national patent offices, which grant them under particular conditions relating notably to the novelty of the invention.

Patent Co-operation Treaty (PCT): a unified procedure for filing patent applications to protect inventions abroad. A PCT application is an international, preliminary application to a patent, which may be followed by national applications at a later stage.

Figure 4.5.4 – **Share of countries in nanotechnology patents filed under PCT** [1]
2004



StatLink http://dx.doi.org/10.1787/335686838251

1. Patent applications filed under the Patent Co-operation Treaty, at international phase, designating the European Patent Office.

Source: OECD (2007), *Science, Technology and Industry: Scoreboard 2007*, OECD Publishing.

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Further information

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Websites

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www.oecd.org/sti/frascatimanual
www.oecd.org/sti/ICTindicators
www.oecd.org/sti/ipr-statistics
www.oecd.org/sti/measuring-scitech
www.oecd.org/sti/oslomanual

4.6 Globalisation

The term "globalisation" has been widely used to describe the increasing internationalisation of financial markets and of markets for goods and services, as well as other production factors (i.e. labour). Globalisation refers above all to a dynamic and multidimensional process of economic integration whereby national resources become more and more internationally mobile while national economies become increasingly interdependent. Traditional statistics no longer suffice to analyse fully the magnitude and consequences of globalisation, and they need to be supplemented by, and combined with, other indicators. Therefore, the OECD developed a wide range of statistics and indicators to provide a more comprehensive portrait of globalisation.

The OECD Handbook on Globalisation

The Handbook on Economic Globalisation Indicators is devoted to measuring the magnitude of the globalisation process and its economic impact, a task which encompasses a potentially large number of areas. Priority was given to all the above driving forces of globalization. The first chapter of the Handbook sets out to **define the concept of economic globalisation**. It also proposes a limited list of reference indicators based on the current availability of the underlying data and policy issues.

The second chapter concerns **foreign direct investment**. It reviews the basic concepts and definitions that apply, including references to the existing manuals, namely the IMF Balance of Payments Manual (5th edition) and the OECD Benchmark Definition of Foreign Direct Investment (3rd edition). It also gives an overview of the data that are currently available and their possible extension, and discusses the main indicators related to international investment.

The third chapter deals with the **economic activity of multinational enterprises**. It develops all the concepts and definitions regarding multinationals, notably the concept of control of an enterprise and the identification of the country of residence of the parent company or the investor which has the ultimate control over its activities. Building on national statistical agencies' best practices, pragmatic and operational recommendations will be made in order to enhance international comparability of indicators and basic data.

The fourth chapter is devoted to the **internationalisation of technology**. Several forms of internationalisation are analysed: the internationalisation of R&D, technological balance of payments and trade in high-technology products.

The fifth chapter deals with certain aspects of the **globalisation of trade**. It focuses on several aspects of the role multinational firms play in international trade, particularly intra-firm trade, as well as other indicators provided on shifts in the structure of international trade, such as intra-industry trade, trade in intermediate goods, intra- and extra- regional trade, methods of evaluating trade balances based on capital ownership and the measurement of international subcontracting.

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As far as the economic dimension of globalisation is concerned, three main domains have to be considered: international trade; foreign direct investment; and the activities of multinationals. Moreover, mobility of the labour force is fundamental to understanding how the global economy works nowadays. Therefore, migration statistics are also considered in this section, although they are not usually considered a branch of economic statistics. Finally, the section also considers statistics on aid flows, a fundamental tool for monitoring policies carried out to support the development of poorer countries.

International trade

International trade in goods and services is a major component of the globalisation process. It is a principal channel of economic integration and a driver for economic growth. Overall trade can represent very significant amounts, exceeding sometimes that of GDP. Trade in goods typically represents over two-thirds of total trade, but trade in services is catching up.

According to United Nations guidelines, international merchandise trade statistics are customs-based and record all goods that add to, or subtract, from a country's stock of material resources by entering (imports) or leaving (exports) its economic territory. Goods simply being transported through a country, or goods temporarily admitted or withdrawn (except for goods for inward or outward processing), are not included in the international merchandise trade statistics. The complex nature of customs and statistical needs necessitate a very detailed commodity classification. The Harmonized Commodity Description and Coding System (Harmonized System, or HS) provides such details. While this nomenclature is based on the nature of the commodity, the Standard International Trade Classification, Revision 3 (SITC, Rev.3), which classifies commodities according to their stage of production, is also used and is considered more suitable for economic analysis.

All OECD countries use the United Nations guidelines, so far as their data sources allow. Depending on the trade system in use (general or special), there may be differences across countries in coverage. In the general trade system, the statistical territory coincides with the economic territory; while under the narrower special trade system, only traded goods in free circulation are recorded. The introduction by the European Union of the single market in 1993 resulted in some loss of accuracy for intra-EU trade because customs documents were no longer available to record all imports and exports. VAT declarations are used instead. Note that while the OECD data mostly follow the UN recommendations, trade statistics reported by Eurostat follow the Community definitions. As a result, OECD trade statistics for European Union countries are not strictly comparable with those reported by Eurostat.

International trade in services is growing in importance around the world. Traditional services – transport and insurance on merchandise trade, as well as travel – account for about half of total international trade in services. But trade in newer types of services, particularly those that can be conducted via the Internet, is growing rapidly.

International trade in services is defined according to the 5th edition of the *IMF Balance of Payments Manual* (BPM5) as service transactions between residents and non-residents of an economy. Services include transport (both freight and passengers), travel (mainly expenditure on goods and services by tourists and business travellers), communications services (postal, courier and telecommunications), construction services, insurance and financial services, computer and information services, royalties and licence fees, other business services (merchanting, operational leasing, professional and technical services, etc.), personal, cultural and recreational services and government services not included in the list above.

Trade negotiators take a broader view of international trade in services, including issues of market access, that is not strictly confined to international trade in the economic sense. Thus, in addition to balance of payments trade, they may also wish to know about delivery of services through the commercial presence of foreign-owned affiliates or through the presence of foreign persons. Both the balance of payments view and the broader view are elaborated in the Manual on Statistics of International Trade in Services (MSITS), jointly published by various international organisations.

BPM5 was issued in 1993 and countries began to implement it in the mid-1990s. MSITS was published in 2002 and implementation has been progressing steadily since. The comparability of trade in services data within the balance of payments has been improved by the application of these standards, by use of partner-country data and comparative methodological studies. Data on sales of services by foreign-owned affiliates are increasingly available, but are less well-developed and less well-harmonized than those from the balance of payments.

Growth in merchandise trade 1996 – 2006 was marked by very fast growth in the BRIC economies (Brazil, Russian Federation, India and China) and in smaller, often central-European, OECD countries. The weight of OECD countries in world trade declined during this decade, from 74% to 67%, and that of G7 countries from 49% to 41%. Between 2000 and 2005, the fastest-growing OECD exports in services were computer and information services, financial, insurance services and other business services.

▶ Key definitions

Exports are usually valued *free on board* (f.o.b.), and **imports** are valued by most countries at *cost, insurance and freight* (c.i.f.), *i.e.* the cost of the goods plus the costs of insurance and freight to bring the goods to the borders of the importing country.

Trade-to-GDP-ratio: the sum of exports and imports divided by GDP, this ratio measures a country's "openness" or "integration" into the world economy. It represents the combined weight of total trade in a the overall economy, a measure of the degree of dependence of domestic producers on foreign markets and their trade orientation (for exports), and the degree to which domestic demand relies on the foreign supply of goods (for imports). It should be noted that this indicator can also be expressed as the average of exports and imports (not as the sum of both).

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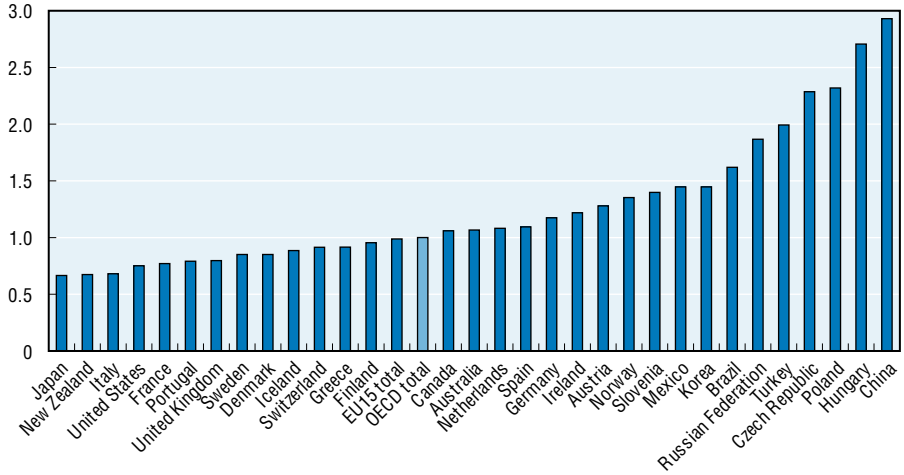
Figure 4.6.1 – **Relative growth of exports of goods**

Growth over the period 1996-2006, OECD total = 1

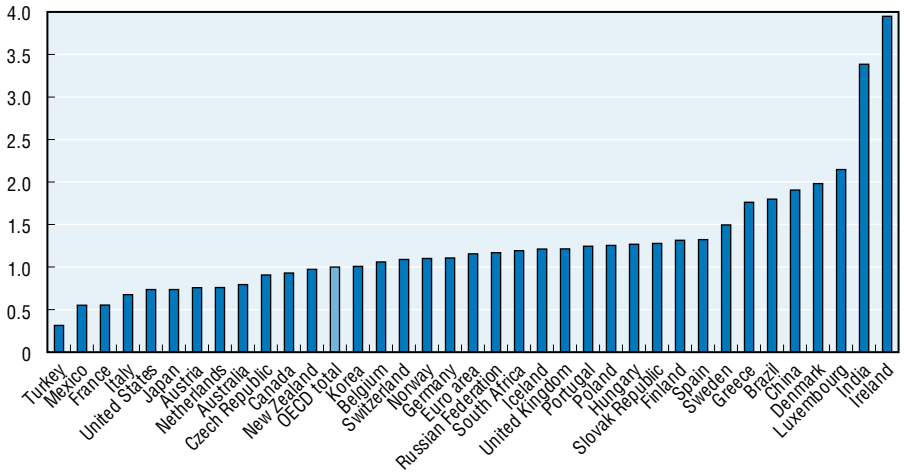


StatLink http://dx.doi.org/10.1787/335688427480

Sources: OECD (2007), *International Trade by Commodity Statistics*, OECD Publishing.
UN, *Commodity Trade Statistics Database*.

Figure 4.6.2 – **Relative annual growth in exports of services**

Growth over the period 1997-2006, OECD total = 1



StatLink http://dx.doi.org/10.1787/335715403748

Source: OECD (2007), *Statistics on International Trade in Services*, OECD Publishing.

Foreign direct investment

Foreign direct investment (FDI) statistics measure cross-border investments that provide the means for creating direct, stable and long-lasting links between economies. Under the right policy environment, FDI can: serve as an important vehicle for local enterprise development; help to improve the competitive position of both host and home economies; provide an important source of capital; encourage the transfer of technology and know-how; and effect the development of international trade. Large multinational enterprises (MNEs) are traditionally the dominant players in such cross-border capital transactions. However, it is believed that small and medium-size enterprises (SMEs) have also become increasingly involved in foreign direct investment.

FDI flows and positions (stocks) comprise mainly three types of financing: equity capital; reinvestment of earnings not distributed as dividends; and inter-company debt. FDI earnings arise from equity, *i.e.* distributed earnings (dividends) and reinvestment of earnings in that enterprise; and from debt. OECD FDI statistics are compiled according to the *Benchmark Definition of Foreign Direct Investment* (see box) and are based on national statistics broken down by partner country and industrial activity according to ISIC.Rev.3.

FDI-based indicators are among the most widely available and commonly used measures of globalisation. For example, to measure the extent of globalisation through FDI (total FDI or by industry), inward/outward FDI financial flows, income flows and FDI positions are divided by GDP. To measure the contribution of host and investing economies or of industries to globalisation through FDI, the following indicators are calculated:

- relative share of inward/outward FDI financial flows by partner country as a percentage of total inward/outward FDI flows;
- relative share of inward/outward FDI positions by partner country as a percentage of total inward/outward FDI positions;
- relative share of inward/outward FDI financial flows by industry as a percentage of total inward/outward FDI flows;
- relative share of inward/inward FDI positions by industry as a percentage of total inward/outward FDI position.

▶ Key definitions

Foreign direct investment: reflects the objective of establishing a lasting interest by a resident enterprise in one economy *(direct investor)* in an enterprise resident in an economy other than that of the investor *(direct investment enterprise)*. For statistical consistency, the ownership of 10% or more of the voting power of a resident enterprise by a non-resident investor is the evidence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise.

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Foreign direct investor: an entity that has a direct investment enterprise resident in an economy other than the economy of residence of the foreign direct investor. A direct investor could be: an individual; a group of related individuals; an incorporated or unincorporated enterprise; a public or private enterprise; a group of related enterprises; a government; estates, trusts and other organisations that own a direct investment enterprise; or any combination of the above.

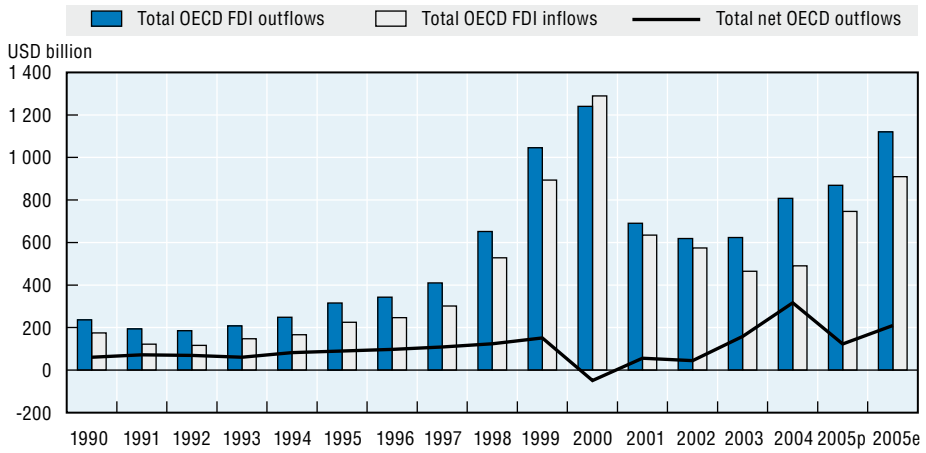
Direct investment enterprise: an incorporated enterprise (a subsidiary or associate company) or an unincorporated enterprise (including a branch) in which a non-resident investor owns 10% or more of the voting power of the incorporated enterprise, or the equivalent of the unincorporated enterprise.

Direct investment positions (stocks of investment): provide, for a given reference date, information on the total stock of investment made by an investing country abroad, or investment received at a given point in time. These data allow a structural analysis of investments by partner country and by industry.

Direct investment financial transactions: show the net FDI inflows and outflows with assets (acquisitions less disposals/redemptions) and liabilities (incurrence less discharges), presented separately by instrument (equity, debt) in any given reference period.

Direct investment income: provides information on the earnings of direct investors and of the direct investment enterprises. The concept of income is closely related to direct investment positions since it is the size of the overall investment that produces the income, not just the most recent transactions. Income relates to recent performance and allows short-term analysis of investment activity.

Figure 4.6.3 – **FDI Flows to and from OECD**



StatLink http://dx.doi.org/10.1787/335752611766

p: provisional.

e: estimated value.

Source: OECD (2006), *International Direct Investment Statistics Yearbook*, OECD Publishing.

OECD Benchmark Definition of Foreign Direct Investment

The *Benchmark Definition of Foreign Direct Investment (Benchmark Definition)* sets the world standard for direct investment statistics since it is fully compatible with the underlying concepts and definitions of the *IMF Balance of Payments Manual (BPM)*. The main focus is FDI statistics encompassing direct investment positions and related direct investment financial and income flows.

In terms of detail and breakdowns, the *Benchmark Definition* goes beyond the aggregate statistics of the functional category "direct investment" of the balance of payments financial account and of the international investment position. To support these recommendations, the *Benchmark Definition* provides guidance on how to compile comprehensive breakdowns by partner country. The revised version completed in 2008 provides guidance on new data breakdowns, such as mergers and acquisitions, pass-through funds (via special purpose entities), and direct investment positions by ultimate investing country. By setting the global standard for FDI measurement, the *Benchmark Definition* complements the *OECD Handbook on Economic Globalisation Indicators*.

The *Benchmark Definition* aims to meet a number of objectives, including: a single point of reference for FDI statistics; clear guidance for countries developing or changing their statistical systems for recording direct investment; international standards for FDI taking into account the effects of globalisation; a better basis for economic analysis of direct investment; practical guidance to users of direct investment statistics, including the relations of FDI to other measures of globalisation; and an objective basis for measuring methodological differences that may exist between partner country national statistics.

Activity of multinationals

The Activities of Foreign Affiliates (AFA) and the Foreign Affiliates Trade in Services (FATS) databases have been created in the framework of OECD work on the globalisation of industrial activities. They are produced thanks to the annual OECD surveys in manufacturing for the AFA database, and in services for the FATS database. Both datasets are broken down by industrial sector and by partner country.

The two databases include data on affiliates under foreign control (inward investment) as well as affiliates located abroad (outward investment), but also on parent companies and national totals in order to allow comparisons. The variables covered are: activity variables (such as employment, turnover, value added, compensation of employees and gross fixed capital formation); variables linked to the internationalisation of science and technology (such as R&D expenditure and number of R&D personnel, but also technology balance of payments); trade-related variables (exports and imports by foreign affiliates and intra-firm trade) arranged by sector and not by product. Unlike data on direct investment flows, which cover all transactions representing more than 10% of firms' capital, data on the activity of affiliates are based on the notion of control.

While data on the manufacturing sector have been available since the beginning of the 1980s, the OECD did not start collecting data on the activity of affiliates in services

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until the second half of the 1990s, and data are not yet available for all OECD countries. There are more variables covered in the AFA than in the FATS database, but the latter includes more partner countries. The number of countries having data on the activities of their affiliates abroad is more limited, as is the number of variables collected.

▶ Key definitions

Control of an enterprise: implies the ability to appoint a majority of administrators empowered to direct an enterprise, to guide its activities and determine its strategy. In most cases, this ability can be exercised by a single investor holding a majority (more than 50%) of the shares with voting rights. The notion of control allows all of a company's activities to be attributed to the controlling investor. This means that variables such as a company's turnover, staff or exports are all attributed to the controlling investor and the country from which he comes.

Foreign affiliate: restricted to affiliates under foreign control that are majority-owned. Accordingly, the geographical origin of a foreign affiliate is the country of residence of the ultimate controller. An investor (company or individual) is considered to be the investor of ultimate control if it is at the head of a chain of companies and controls directly or indirectly all the enterprises in the chain without itself being controlled by any other company or individual.

The share of foreign affiliates in employment: the ratio between employment by foreign affiliates and total employment in the compiling country. Employment data can be used to determine the share of affiliates under foreign control in host country employment, or to help determine the extent to which employment by affiliates under foreign control complements or substitutes for domestic (home country) employment by parent companies or other domestic firms.

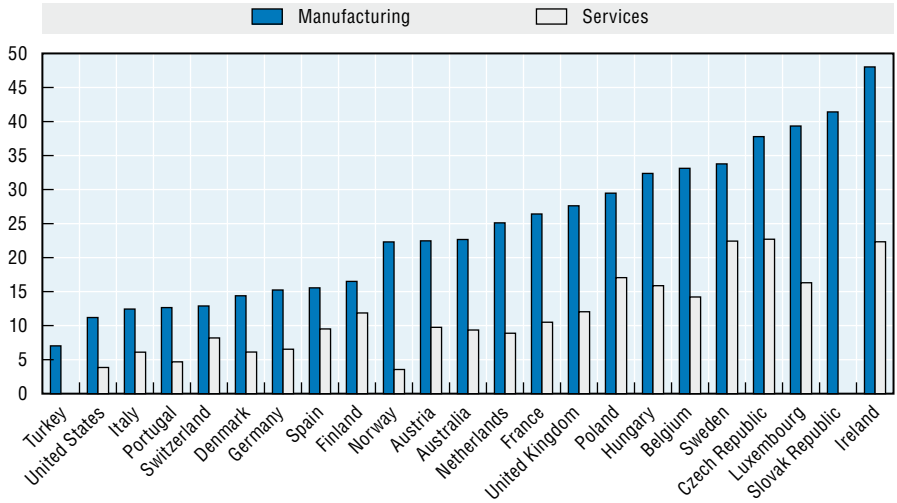
Share of foreign affiliates in turnover: the ratio between turnover by foreign affiliates and total turnover in the compiling country. Unlike value added, turnover indicates the extent to which affiliates under foreign control are used to deliver outputs originating in the affiliates themselves or in other firms.

Share of R&D expenditure performed by foreign affiliates: it shows the share of industrial R&D under foreign control and that which is controlled by the residents of the compiling countries. It is aimed at measuring the growing internationalisation of R&D activities of multinational firms linked to an increase in the number of R&D laboratories located abroad.

Share of intra-firm trade in the total trade of a country: intra-firm trade refers to trade between enterprises belonging to the same group, located in different countries. For inward investment, the ratio of intra-firm trade to the total trade of countries publishing the relevant data is quite high. Once foreign investments have been made, these transactions reflect centralised decisions made as part of a group's global strategy. This indicator can also be calculated in terms of total trade by affiliates under foreign control.

Figure 4.6.4 – **Employment in manufacturing and services in affiliates under foreign control**

As a percentage of total employment, 2005 or latest available year



StatLink http://dx.doi.org/10.1787/335807876774

Source: OECD (2007), *OECD Science, Technology and Industry: Scoreboard 2007*, OECD Publishing.

Migration statistics

Since the end of the 1990s, issues related to international migration have received increasing attention from policy makers. This reflects, among other things, the increasing international movements that have taken place following the fall of the Iron Curtain and the growing globalisation of economic activity. In addition, demographic imbalances between developed and developing countries and large differences in real wages have tended to encourage, today as in the past, the movements of workers from economies where they are in surplus to those where they are most in need. Until recently, it has been difficult to provide an accurate and comparative overview of stocks of migrants and of migration flows in OECD countries because commonly used data sources do not all define the migration phenomenon in the same way.

To improve the international comparability of migration statistics, the OECD created in 2005 a new database on the immigrant population by country of residence, country of birth and educational attainment. This database compiles OECD population censuses and register data around the year 2000. For the first time, it provides a picture of brain drain/brain exchange, both within OECD countries and from

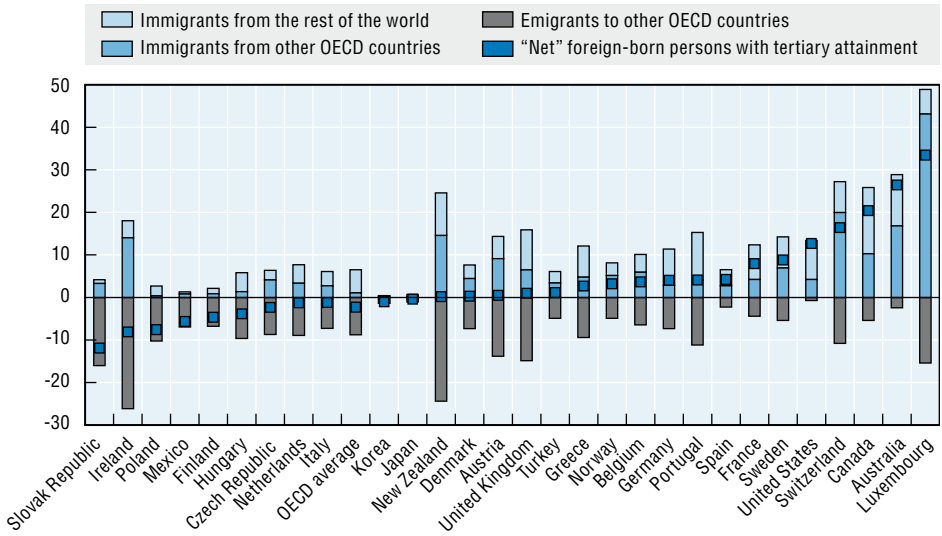
non-OECD countries to the OECD area (based on estimates of emigration rates), based on demographics and educational attainment. After release of the first version of the database, the follow-up was expanded to include more data on demographic labour force characteristics, such as occupation and sector, field of study and year of arrival.

A preliminary set of standardised statistics on permanent-type migration flows, compiled and published for the first time in 2006, has been recently updated. An extension is currently being created to cover temporary movements.

In addition, the OECD International Migration Database contains annual series on foreign and foreign-born populations, migration flows (inflows into/outflows from selected OECD countries) and naturalisations. It also includes statistics on the employment status of foreigners and foreign-born by gender for selected years. These data are published in the annual report *International Migration Outlook*. This report also include country notes describing recent trends in migration movements and policies, including standardised tables on migration flows and stocks, macroeconomic indicators such as real GDP, components of population growth and labour market outcomes.

Figure 4.6.5 – **Foreign-born persons with tertiary attainment**

As a percentage of all residents with tertiary attainment, circa 2000



StatLink http://dx.doi.org/10.1787/335841121510

Source: OECD (2007), *International Migration Statistics*, OECD Publishing.

International mobility of the highly skilled: the "brain circulation"

The issue of the extent of gains (or losses) from international migration is one that periodically comes to the forefront of policy agendas. Countries are afraid of losing their "best and brightest" to movements abroad, whether for study or for longer-term expatriation, if not always permanent settlement. On the other hand, countries that recruit significant numbers of highly educated persons from developing countries are accused of contributing to brain drain from these countries and of hampering their economic development.

Concern with "brain drain" is not limited to developing countries. It arose in a number of European countries in the late 1990s, when it was feared that many high technology graduates were leaving their home countries for high-paying jobs elsewhere, especially in the United States. Concern arises periodically when statistics are published on international students abroad or on the emigration of highly educated persons. Rarely evoked are the gains from immigration of the highly educated.

Until recently, there was little information on the actual extent of movement and on the net balance between immigration and emigration of persons with university qualifications. This is why a few years ago the OECD launched a special census data collection, whose data are now included in the International Migration Database. Most censuses in member countries were conducted around 2000, and the results are currently available for almost all of them. Several countries, however, do not have a population census, so data from population registers or from large sample surveys have been used instead. The database currently includes data on the foreign-born in OECD countries by place of birth, nationality and educational attainment (three levels), and new data on employment by occupation have recently become available. These figures concern the number of native and foreign-born persons with tertiary education living in each country. Expatriates in the OECD area are defined as residents in any OECD country born in another OECD country or in a non-OECD country, whether naturalised or not. The information in the database therefore reflects the cumulative effect of movements within, and to, the OECD area over the past decades.

The results show that only a few countries gain from intra-OECD migration of the highly educated. These are Australia, Canada, Luxembourg, Norway, Spain, Sweden, Switzerland and the United States. If immigration of persons with university qualifications from outside the OECD is factored in, however, the balance becomes significantly positive for another set of countries, including Belgium, Germany, Greece and Portugal. For most other countries, the negative net balance is considerably reduced. In short, although many OECD countries lose from migration of the highly educated, immigration from developing countries tends to considerably offset the loss.

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Development aid statistics

Statistics on financial flows to developing countries are reported to the OECD by the 23 members of the Development Assistance Committee (DAC), international organisations and some non-DAC donor countries (although reporting may vary from year to year for these donors). Reporting is usually carried out by the country's official aid agency, and is based on common definitions and standard classifications agreed by the DAC and the DAC Working Party on Statistics.

The most important statistical category in the measurement of development aid is official development assistance (ODA). ODA activities are financed through grants and "soft" (or concessional) loans to countries on the DAC List of ODA Recipients and have the promotion of economic development and welfare of recipient countries as their main objective. ODA also includes some expenditures which occur in the donor country such as administrative costs, some support to students from developing countries, aid to refugees in the donor country and the promotion of development awareness.

Most donor countries have committed to reaching the ODA target of 0.7% of donors' GNI, which was adopted by the United Nations in 1970, and has become a benchmark of aid policy. However, as the Figure below shows, in 2006 only five countries met this target. Several other international targets exist in respect to ODA, notably more recent ones set at the G8 Gleneagles summit and UN Millennium +5 summits in 2005, where donors committed to increase their aid. The pledges made at these summits, combined with other commitments, implied lifting aid from USD 80 billion in 2004 to USD 130 billion in 2010 (at 2004 prices and exchange rates).

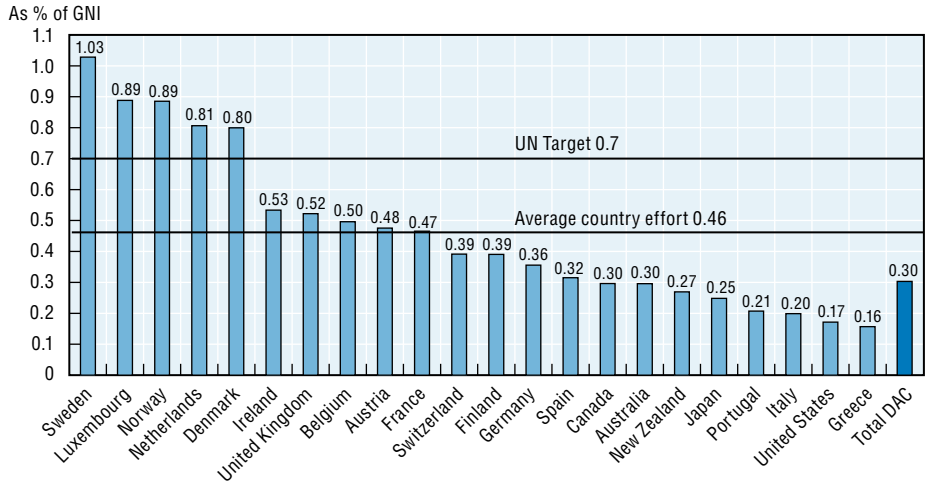
A series of targets has also been agreed to for aid to the least-developed countries (LDCs), the best known being an undertaking to spend 0.15% of donors' national income on this group.

DAC data also address types and quality of aid provided. Types of aid include investment projects, programme aid, technical cooperation, cash and commodity aid, humanitarian aid and debt relief. An important measure of aid quality is the degree to which procurement is tied to the donor country's goods and services. The DAC Recommendation on untying ODA to the least developed countries has increased the amount of aid that is untied, so as to ensure value for the money spent in aid procurement. DAC members have also gradually improved the terms on which they offer aid: the vast majority of aid is now given as grants.

The data are available on-line through an interactive database which comprises the DAC annual aggregate statistics and the Creditor Reporting System on individual aid activities.

Figure 4.6.6 – **Net ODA in 2006**

As a percentage of gross national income (GNI)



StatLink http://dx.doi.org/10.1787/335850520144

Sources: OECD (2007), *Geographical Distribution of Financial Flows to Aid Recipients, 2001-2005,* OECD Publishing.
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Further information

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Online databases

OECD International Trade by Commodity Statistics
OECD Statistics on Measuring Globalisation
OECD Monthly Statistics of International Trade
OECD International Development Statistics
OECD Statistics on Trade in Services by Service Category.
OECD Statistics on Trade in Services by Partner Country.
Available at *www.sourceoecd.org/database/oecdstat*.

Websites

www.oecd.org/statistics/globalisation
www.oecd.org/statistics/trade
www.oecd.org/dac/stats
www.oecd.org/sti/measuring-globalisation
www.oecd.org/sti

4.7 Short-term economic indicators

One of the OECD flagship publications is *Main Economic Indicators*, which represents the largest collection of short-term economic indicators for OECD countries. It contains monthly and quarterly data covering a long period of time (for some indicators, 40 years or more). The OECD collects a wide range of intra-annual economic indicators concerning the state of various industrial and services sectors (production, orders, turnover, etc.), as well as costs and prices. Moreover, the OECD has promoted the development of opinion surveys about the current economic situation of enterprises and households, as well as about expectations on future developments: therefore, the OECD has built a unique database containing this type of data, widely used by analysts and policy makers. Finally, the Organisation has developed over time a very successful system of cyclical indicators, able to provide early signals of changes in economic growth, not only for OECD countries, but also for the most important non-member economies.

Economic activity indicators

Short-term economic activity indicators are intended to be useful for understanding short-term movement of various economic activities such as production, sales, orders received, work started, work in progress, or stocks accumulated. At present, such indicators are available for a few selected industries, such as industrial sector, construction sector, wholesale and retail trade sectors, and some services sectors. This information is normally collected in almost all OECD countries at quarterly or monthly frequency using surveys and/or administrative sources, depending upon subjects or countries. Further information is noted in country metadata.

Data for industrial production, orders and stocks for manufacturing goods, as well as data for turnover for retail trade come from sample surveys, while information on orders received, work started or progress in construction are normally collected from administrative sources. Data are expressed in various units, such as indices with averages for a reference year equal to 100, physical units (*e.g.* numbers, square or cubic meters), percentages, etc.

Depending on countries and sectors, production can be measured from deflated turnover or sales, value added, physical output, raw material inputs, hours worked or other employment data. Samples generally include all units whose employment is above or equal to a certain threshold. Some countries apply random sampling under this threshold. Data refer to the whole period (i.e. entire month or quarter).

▶ Key definitions

Index of industrial production (IIP): one of the main indicators of short-term economic analysis, the index provides information on the goods produced by establishments engaged in mining (including oil extraction), manufacturing, and the production of electricity, gas and water (*i.e.* sectors C, D and E of ISIC Rev.3). Data are generally presented in indices that measure volume changes in output, as well as in physical volume, or in a ratio. Weights for IIP are estimated from gross value added at factor cost of the base year. Countries make their own estimates if there

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are non-replies, and seasonal and working day adjustments are common practices among OECD member countries.

Index of services production (ISP): measures changes over time in the volume of output for the services sector. More precisely, ISP is defined as the ratio of the volume of output produced by the services industries in a given time period to the volume produced by the same industries in a specified base period.

Retail trade index: turnover of retail sales units. Turnover comprises the totals invoiced by the observation unit during the reference period, and this corresponds to gross sales of goods or services supplied to third parties. Retail trade index includes the activities listed in Division 52 of ISIC Rev.3 or NACE Rev. 1. However, there are significant differences among OECD member countries in activity coverage.

Sales of manufactured goods: value or volume of manufactured goods sold or delivered domestically or in foreign markets. Data generally exclude discounts, returns, allowances and taxes. Manufactured goods can be further disaggregated by type, such as intermediate, investment and consumer (durables or non-durables) goods.

Orders of manufactured goods: orders received by manufacturing units from domestic and foreign markets during the reference period for immediate or future delivery. Production-related services as well as consumption taxes, packaging and shipping and transportation costs are included. VAT, rebates, re-sales without further processing and cancellations are excluded.

Permit issued for construction: refers to various measures (*e.g.* floor area, physical volume, monetary value) of approved construction-work permits by type of structure and building use. In addition to new construction, the data cover alterations, extensions, repair and/or renovation of already existing structures, depending on countries.

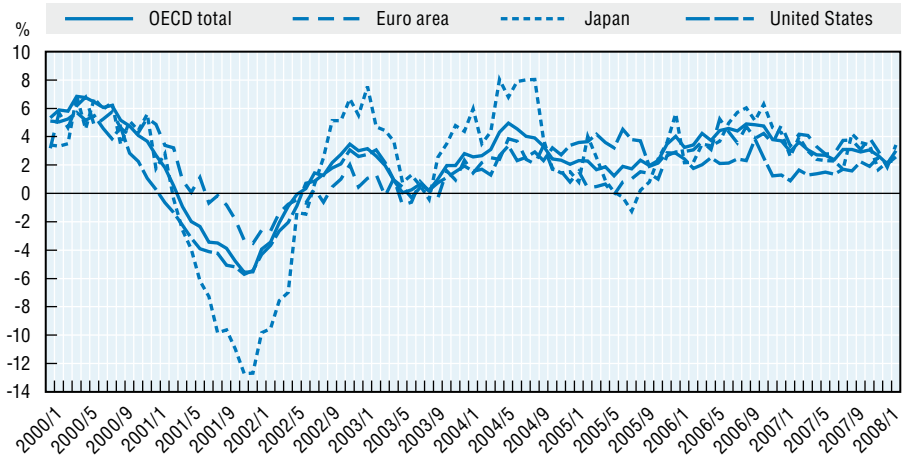
Work started for dwelling construction: generally refers to the number of dwellings for which construction work commenced in the reference period. In some cases, data may refer to gross surface or physical volume of construction work started for dwellings or buildings. Construction is considered as underway once a foundation has been laid or is in preparation (for example, when digging has begun).

Stocks of manufactured goods: generally refers to products (*i.e.* output and input products) remaining in the reporting unit at the end of the reference period. Output products comprise finished products of own manufacturing (products ready for sale) plus finished products manufactured by others (products for resale without additional manufacturing by the reporting unit). Input products include raw materials, semi-manufacture and materials needed for distribution of the finished products. Thus, stocks generally comprise the sum of raw materials, intermediate and finished goods.

Rate of capacity utilisation: ratio between the actual output and the maximum that could be produced with existing plant and equipment.

Figure 4.7.1 – **Industrial production**

12-month rate of change



StatLink http://dx.doi.org/10.1787/335857028335

Source: OECD (2008) *Main Economic Indicators*, OECD Publishing.

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The OECD revision database

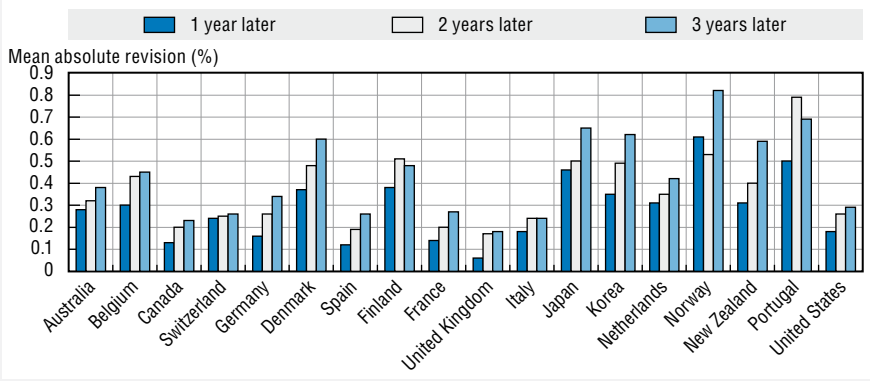
First releases of official statistics are often revised in subsequent releases, sometimes substantially. Such revisions can impact policy decisions, since revisions to first-published data may alter the previous assessment of the state of the economy. This may occur through a changed interpretation based on the revised data themselves or the impact the revisions may have on econometric models. While this is a recognised issue of key importance, many producers of official statistics do not quantify expected revisions to their data, and economists do not have the required data to test the sensitivity of their econometric models to revisions in input data. This important gap in knowledge required to effectively use official statistics motivated the OECD to develop a unique product: the *Main Economic Indicators Original Release Data and Revisions Database*, freely available at: *http://stats.oecd.org/mei/default.asp?rev=1* .

This product allows both users and producers of official statistics to study the magnitude and direction of subsequent revisions to official statistics and for economists to test the likely effectiveness of econometric models in simulated real-time. The database interface contains full time series, as far back as 1960 in some cases, for 21 key economic variables as originally published in each monthly edition of the OECD Main Economic Indicators CD-Rom, from February 1999 onwards, for OECD countries, the Euro area, China, India, Brazil, South Africa and the Russian Federation. This database is updated on a monthly basis and provides the raw data needed by economists to test the performance of their econometric models in simulated real time.

The revision analysis website also provides access to: comprehensive revisions analysis studies performed by the OECD for GDP (see chart), index of industrial production and retail trade volume; automated programs; a detailed user guide and revision analysis tool allowing users to perform their own revisions analysis based on the OECD methodology; and information on reasons for revisions, together with recommended practices to aid producers of official statistics in establishing a transparent revisions policy for economic statistics.

Figure 4.7.2 **– Mean absolute revision to first published estimates of quarter-on-previous-quarter growth rates for GDP at different intervals**

Period 1995 – 2004



StatLink http://dx.doi.org/10.1787/336004167350

Cost of labour

The cost of labour is an important factor influencing the development of inflation in an economy, as increases in the cost of labour ultimately place pressure on the producers of goods and services to pass on these costs in the form of price increases. Consequently, central banks monitor closely the development of labour costs in their analysis of the economy and in their deliberations concerning monetary policy.

Direct payment for labour services in the form of wages and salaries generally accounts for around 80% of total labour costs. Other labour costs include: bonus payments; payments in kind related to labour services (*e.g.* food, fuel, housing); severance and termination pay; employers' contributions to pension schemes, casualty and life insurance and workers compensation; cost of employee training, welfare amenities and recruitment; taxes on employment (*e.g.* payroll tax); and fringe benefits tax.

Short-term statistics on the evolution of labour costs tend to focus on the wages and salaries component, as this constitutes the bulk of labour costs and data is generally available at a high frequency (*e.g.* from payrolls). In addition, wages and salaries are the component of labour costs most likely to change in the short term, and indeed, changes in other components of labour costs are often linked to changes in the wages and salaries component.

The OECD aims to present short-term statistics (*i.e.* monthly or quarterly) on the growth rate of *hourly earnings* in member countries for manufacturing industries and total private sector, with earnings defined as wages and salaries (including bonuses) plus payments in kind.

A more complete measure of labour costs' potential influence on inflation comes from assessing the evolution of *unit labour costs* (ULCs). Unit labour costs measure the average cost of labour per unit of output. They are calculated as the ratio of total labour costs to real output, or equivalently, as the ratio of mean labour costs per hour to labour productivity (output per hour). As such, ULCs represent a link between productivity and the cost of labour in producing output. Consequently, increases in ULCs often signal pressures faced by producers of goods and services to pass these costs on in the form of higher prices.

The OECD System of ULC Indicators calculates annual and quarterly measures according to a specific methodology to ensure data are comparable across OECD countries. Data are available for all OECD countries and the Euro area for a wide range of sectors (including total economy, manufacturing, industry, market services and the business sector). Annual time series also include a suite of related indicators such as: exchange rate-adjusted unit labour costs; labour income share ratios; labour productivity measures; and labour compensation per unit labour input measures. Quarterly unit labour cost indexes produced through the OECD system therefore represent a key short-term economic statistic for monitoring labour cost evolution in OECD member countries in regards to associated inflationary pressures.

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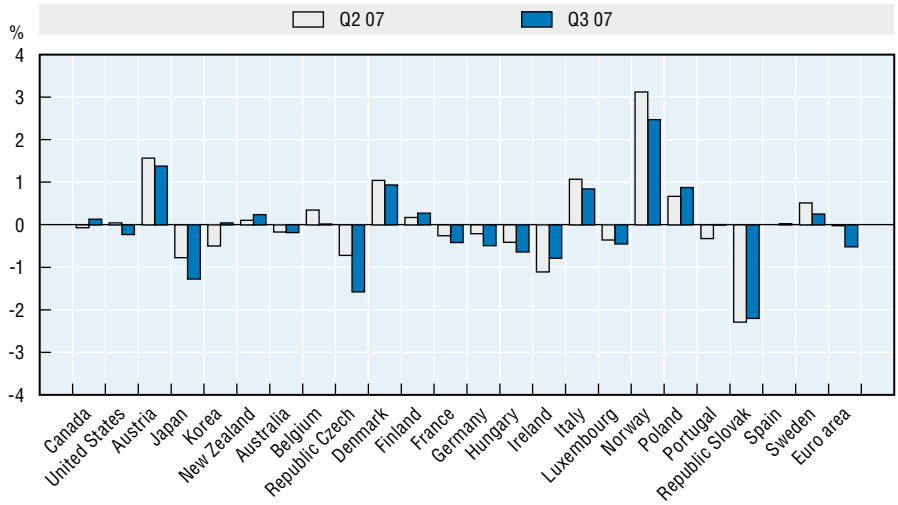
Figure 4.7.3 – **Unit labour cost (industry)**

Quarter-on-previous-quarter rate of change



StatLink http://dx.doi.org/10.1787/336051366873

Source: OECD (2008), *Main Economic Indicators*, OECD Publishing.

Consumer prices and other inflation measures

Inflation measures the change in the overall price level of goods and services. It is an averaging concept and has to be distinguished from price changes in individual products, or from price change comparisons between products. For example, if the price of strawberries compared with the price of mushrooms is higher in autumn than it was during the summer, this is not a sign of inflation. Inflation is the average price change in a set of goods and services. Because many different sets of products can be considered, there are also many measures of inflation, with differences in scope and differences in use.

The single most important measure of inflation is the *consumer price index* (CPI). CPIs have a long history dating back to the 18th century (one of the first purposes of CPIs was to compensate wage-earners for a rising price level by adjusting wage rates in proportion to the CPI, a procedure known as indexation). CPIs measure the average change in prices for a basket of goods and services typically purchased by specific groups of households. Averages are formed by observing the price changes for goods and services and by weighting these price changes by the share that each group of goods or services occupies in the total expenditure of households. Thus, even small changes in the price of a product that has a large expenditure weighting can affect the overall index of consumer prices.

Note also that because expenditure shares are average shares across all households, they reflect a consumption pattern that may be more or less appropriate for specific groups of households. For example, low-income households tend to spend a larger

share of their income on food and housing than high-income households. Thus, the same change in food prices will affect inflation for low-income households more than for high-income households. Recently, statistical agencies (*e.g.* in Germany, France and the United Kingdom) have put in place 'inflation calculators' through which individuals can specify their consumption patterns and then observe their personalized CPI.

Four consumer price indicators are published by the OECD for the 30 member countries and are defined under the Classification of Individual Consumption by Purpose (COICOP) to assure their comparability, namely:

- the *CPI all-items* covers all goods and services included for price measurement in the CPI;
- the *CPI food* covers food and non-alcoholic beverages according to COICOP 01. It excludes purchases of restaurant meals, as well as alcoholic beverages, tobacco and other narcotics;
- the *CPI energy* is intended to covers main forms of energy, including electricity, gas and other fuels (COICOP 04.5) and fuels and lubricants for personal-transport equipment (COICOP 07.2.2);
- the *CPI All items less food less energy* provides an indication about "core inflation", *i.e.* the inflation that does not take into account the most volatile price components.

These four indicators are aggregated by the OECD into five zone areas: OECD-Total, OECD-Europe, Major Seven, OECD-Total excluding high-inflation countries, OECD-Europe excluding high-inflation countries. CPI data for zones, based on national indices, are annual chain-linked Laspeyres indices. The weights for individual links are based on the previous year's household private final consumption expenditure based on national accounts data.

The OECD also publishes the most recent prices data for the Euro zone, the European Union and a number of non-member economies (Brazil, China, India, Indonesia, Russian Federation and South Africa). The Euro zone (15 countries) and the European Union area (27 countries) refer to the Harmonised Index of Consumer Prices (HICP) published by Eurostat. HICPs are consumer price indices compiled on the basis of a harmonized coverage and methodology for European countries.

Another central measure of inflation is the *deflator of GDP*. This requires some extra explanation. Gross domestic product (GDP) corresponds to the value of all final expenditure on final goods and services produced in the economy. Final expenditure comprises private consumption, investment, government expenditure and exports minus imports. The deflator of GDP is the price index of this expenditure. A rise in the GDP deflator thus signals that, on average, the prices of final expenditure have gone up. Because GDP is a broader concept than private consumption, the GDP deflator may move differently, for example, from the deflator for private consumption, which is a component of the broader GDP deflator. The deflator for private consumption is closely related but not identical to the CPI described earlier. Along with the deflator for private consumption, there are also deflators for other expenditure categories, such as investment.

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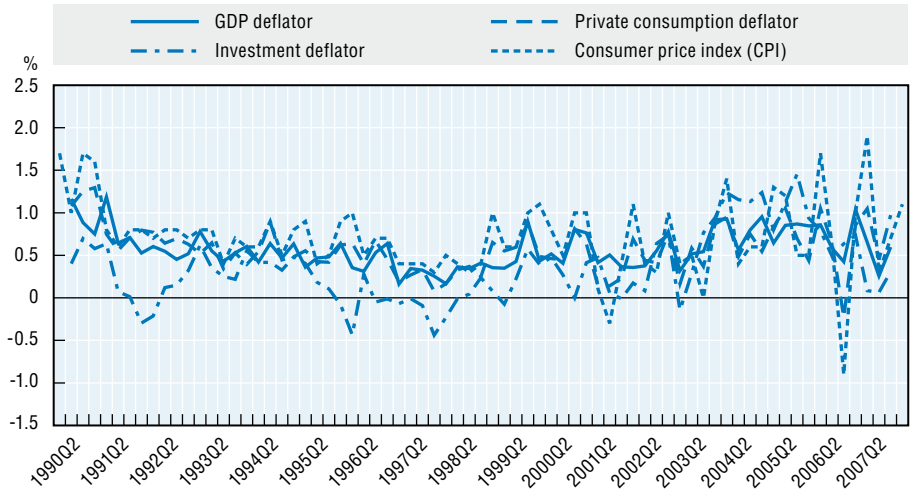
The chart below presents some inflation measures for the United States. It is immediately apparent that the price level of investment goods rises at a much lower rate than the overall price level. To a large extent, this reflects technical change and declining prices for information and communication technology goods. It is also apparent that the CPI rises relatively quickly compared to the other price indices and shows more volatility.

Figure 4.7.4 – **Different measures of inflation, United States**

Percentage change from preceding quarter



StatLink http://dx.doi.org/10.1787/336063618666

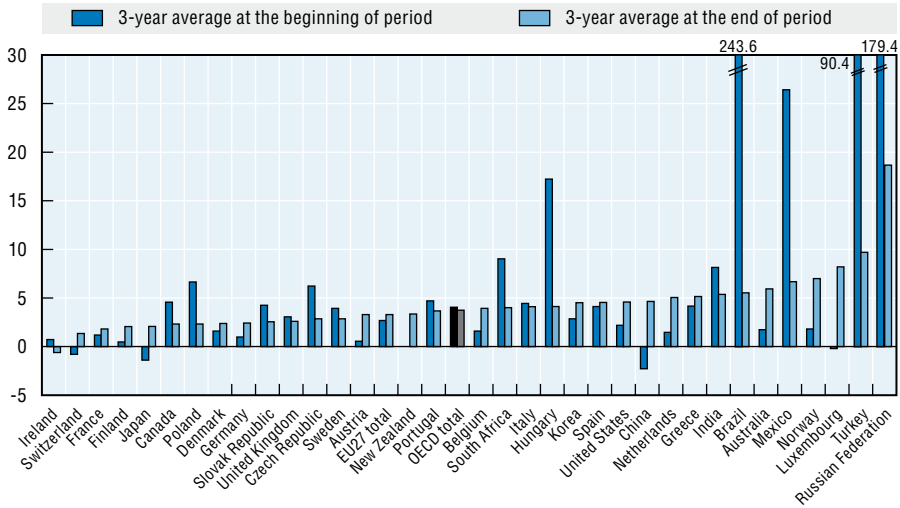
Sources: OECD (2008), *Quarterly National Accounts*, OECD Publishing.
OECD (2008), *Main Economic Indicators*, OECD Publishing.

While consumer prices and investment-good prices measure price changes from the perspective of those who purchase or use goods and services, *producer prices* measure inflation from the perspective of those who produce goods and services. Thus, producer price indices measure the average change in output prices, irrespective of who purchases the goods and services. Producer prices comprise prices of final products (those purchased by consumers, invested or exported) and prices of intermediate products (those used by other producers). Thus, producer price inflation has a different scope from consumer price inflation or from the price developments for total GDP.

Figure 4.7.5 presents the year-on-year changes in producer price indices for the manufacturing sector in selected OECD countries. Producer prices are of interest because they tend to rise or fall with a lead time relative to the price indices for final expenditure, and this can provide useful signals to policy makers. Producer prices are also important tools for statisticians in calculating the output of particular industries at constant prices, so that productivity developments can be monitored, for example.

Figure 4.7.5 – **Producer price indices: manufacturing**

Average annual growth in percentage



StatLink http://dx.doi.org/10.1787/336071753261

Source: OECD (2007), *Main Economic Indicators*, OECD Publishing.

The year-on-year changes in producer price indices shown here are intended to refer to the producer price indices for manufacturing. However, many countries do not calculate such indices for the manufacturing sector alone, or they calculate wholesale price indices rather than producer prices indices. Wholesale prices include taxes and transport and trade margins in addition to the ex-factory cost of goods. There are also differences between countries in how they adjust prices for quality changes, in the frequency with which the weights are updated, and in the formulae used to derive the price indices.

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The OECD Handbook on Hedonic Prices

Deflators for real output, real input and real investment – for producing productivity measures or value added in national accounts – are derived primarily from price indices estimated by statistical agencies. Whether the deflators are consumer price indices or producer price indices, changes in the quality of the products has long been recognised as perhaps the most serious measurement problem in estimating price indices. In national accounts, any error in the deflators creates an exactly equivalent error of opposite sign in the real output, real input, real investment and real consumption measures. For this reason, discussing the problems posed by quality change in price indices is the same thing as discussing the problems of quality change in quantity indices, and therefore in measures of productivity change as well.

The issue of quality changes has become more relevant since the development of information and communication technologies (ICT) accelerated in the last 20 years. Since then, a lot of work has been devoted to understanding the contribution of ICT products to economic growth and to measures of labour productivity. Different quality adjustment methodologies are employed for ICT products across OECD countries, and they seemingly make large differences in the trends of price movements for these products. As pointed out some years ago, changes in computer equipment deflators among OECD countries ranged from plus 80% to minus 72% for the decade of the 1980s; the largest decline occurred in the US hedonic price indices for computer equipment.

International comparisons of productivity growth are clearly affected by these inconsistencies. If different quality adjustment procedures among OECD countries make the data non-comparable, then the measured growth of ICT investment and of ICT capital stocks will not be comparable across OECD countries. Therefore, in 2004 the OECD published the *Handbook on Hedonic* Prices to review the methods employed to adjust for quality change in price indices.

A natural division is between "conventional" methods typically employed by the statistical agencies of many OECD countries, which are discussed in the Handbook, and hedonic methods for adjusting for quality change (alternatively known as hedonic price indices). The latter have a prominent place in price indices for ICT products in several OECD countries. Hedonic methods for producing quality adjusted price indices are thus reviewed in the Handbook, which also goes beyond the economic literature in significant respects, particularly in the comparison of conventional and hedonic methods. In particular, the Handbook compares and contrasts the logic of hedonic methods and conventional methods and the results of employing them in different circumstances. Although most of the examples in the handbook are drawn from ICT products, the principles in it are very general and apply as well to price indices for non-ICT products that experience rapid quality change, and also to price indices for services, which are affected by quality changes fully as much as price indices for goods, though sometimes that has not been sufficiently recognised.

The Handbook sets out principles for "best practice" hedonic indices. These principles are drawn from experience with hedonic studies on a wide variety of products. The Handbook also considers some objections that have been raised to hedonic indices.

What inflation measures tell us and what they don't

The scope of goods and services that should be included in the CPI has been a subject of debate. While inclusion of some items is obvious, consideration of others is not. The single most important item of discussion has been the cost of housing to house owners who occupy their own dwelling. There is no rental transaction because the owner rents the dwelling to himself. It has been argued that the purchase of a house resembles more a financial investment than a purchase of another consumer product, and the implicit rent associated with home ownership should therefore be excluded from the consumer price index, just as other financial assets (such as shares or bonds) are outside the scope of the CPI. Other statisticians would argue that the main purpose of a dwelling is to provide housing services and the price of these housing services should be reflected in the CPI, whether the house is owned by its occupier or whether it is rented.

Note, however, that even when owner-occupied housing is recognized as part of the CPI, it is normally not the purchase price *as such* that enters the CPI but an estimate of the rent that the owner "pays to himself". Over longer periods, the price of rents tends to follow the purchase price of houses, but in the short run this may not be the case. Thus, users are sometimes astonished to find that rapidly rising prices in property markets they experience in their daily lives are only slowly, or not at all, reflected in their country's CPI. The subjective perception of price developments by consumers may also be different from measured inflation because individuals tend to purchase durable consumer goods, such as TV sets or computers, only once in several years. Thus, individuals hardly perceive price changes (for example, price declines for information-technology goods), but of course these price changes are picked up in the measured CPI.

Business tendency surveys and consumer opinion surveys

Business tendency surveys are carried out to obtain qualitative information for use in monitoring the current business situation and forecasting short-term developments. Information from these surveys has proved of particular value in forecasting turning points in the business cycle. The information collected in business tendency surveys is described as qualitative because respondents are asked to assign qualities, rather than quantities, to the variables of interest. Compared to traditional statistical surveys, which usually cover only variables on one aspect of an enterprise's activity, business tendency surveys collect information about a wide range of variables selected for their ability, when analysed together, to give an overall picture of a sector of the economy. For example, most business surveys collect information on production, order books, new orders, stocks of finished goods, exports, employment and prices.

The statistical series derived from business tendency surveys are particularly suitable for monitoring and forecasting business cycles. The cyclical profiles of the series are in many cases easy to detect because they contain no trend. Usually the series are seasonally adjusted (at least to some extent) by the respondents, and this adds to the smoothness of the series. The series usually do not need revisions. This and the fact that they reflect assessments and expectations by businessmen facilitate their use in forecasting and in predicting turning points in the business cycle, in particular.

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A harmonised system of business tendency surveys has been developed by the European Union and the OECD. Harmonised business tendency survey data has proved reliable and useful for policy makers. Another advantage of using the harmonised system is that it allows participating countries to compare their business tendency survey results with those of neighbouring or competing countries. It also makes it possible to construct regional totals or totals for economic groupings. And in a world of increasing globalisation, the ability to make comparisons among countries and regions is clearly an advantage. The harmonised system includes surveys of four sectors: industry, which covers manufacturing, as well as mining and quarrying, gas, water and electricity, depending on their importance; construction; retail trade; services.

These sectors have been selected because they cover the kinds of economic activities that are most sensitive to cyclical fluctuations. Agriculture is primarily influenced by climate, and many social and government services – health, education, defense and public administration, for example – respond slowly, if at all, to movements in the business cycle. Business surveys for these activities are therefore less relevant. In addition to their sensitivity to business cycles, industry, construction and trade are interesting activities for economic analysis because they are sectors whose movements are usually correlated with three key macro-economic aggregates – industry with GDP, construction with gross fixed capital formation and retail trade with private consumption.

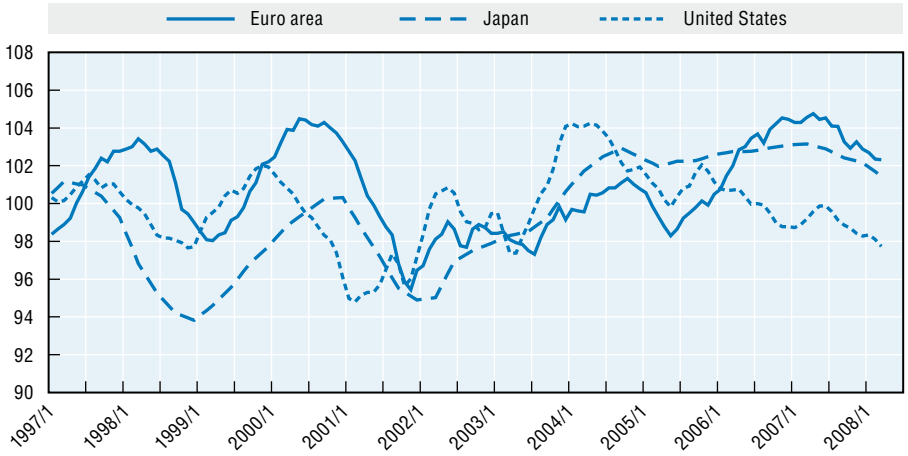
Consumer opinion surveys also provide qualitative information that has proved useful for monitoring the current economic situation. Typically, they are based on a sample of households, and respondents are asked about their intentions regarding major purchases, their economic situation now compared with the recent past and their expectations for the immediate future.

▶ Key definitions

Confidence indicators based on a single survey question: answers to questions on the "general business situation" will usually be based on a combination of factors, such as respondents' appraisal of order books and expected new orders, as well as expectations about interest rates, exchange rates and political developments. These are confidence indicators and may be used as leading indicators for predicting short-term economic developments.

Composite confidence indicators: rather than relying on answers to a single question, a set of survey variables can be combined into a single composite confidence indicator, which summarises economic agents' assessments of, and expectations for, the general economic situation.

Figure 4.7.6 – **Business confidence indicator**



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Composite leading indicators

Economic development in market economies is characterised by a succession of cycles with alternating phases of expansion and contraction in economic activity. The cycle may be defined by reference to the absolute level of economic activity. A downturn occurs when economic activity falls in absolute terms, and an upturn occurs when it begins to increase in absolute terms. This can be described as the classical definition of a cycle. The alternative is to define cycles in terms of growth rates. A downturn occurs when the growth of economic activity falls below the long-term trend, and an upturn occurs when the growth rate rises above it. Growth cycle contractions/expansions include slowdowns/pick-ups, as well as absolute declines/increases in activity, whereas classical cycle contractions/expansions include only absolute declines/increases.

Many survey series provide advance warning of a turning point in aggregate economic activity as measured by GDP or industrial production. The ability of business tendency survey data to predict the cycle's turning point makes them very suitable as leading indicators. Moreover, business tendency survey data can be combined with quantitative statistics to obtain a more structured cyclical indicator system, in particular, the construction of leading indicators.

Cyclical indicator systems are constructed around a reference series, *i.e.* a target series that reflects overall economic activity and whose cyclical development it is intended to predict. The reference series is used to establish the "timing classification" of statistical indicators into leading, coincident or lagging indicators. Statistical series are normally selected for inclusion in a cyclical indicator system if they meet the following criteria: relevance – there must be an economic rationale for expecting a leading relationship; cyclical behaviour – the length and consistency of lead is obviously important as is cyclical conformity (general fit), the absence

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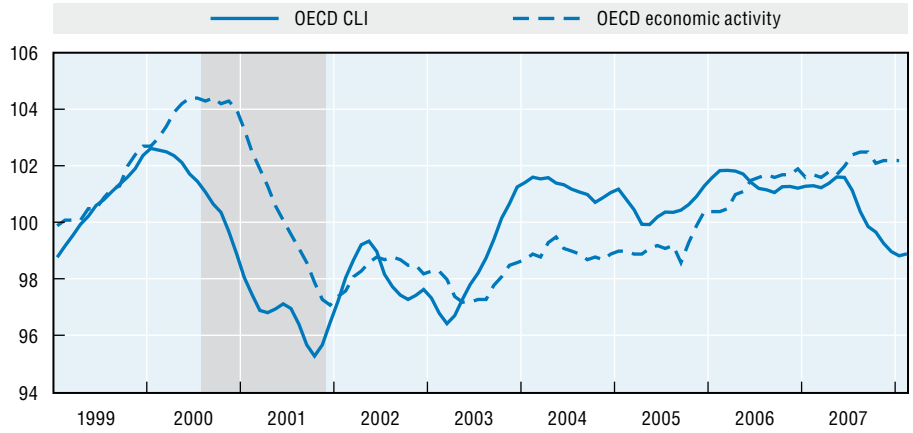
of extra or missing cycles and the smoothness of the series over time; practical considerations – these include the frequency of publication (at least quarterly and preferably monthly), no large revisions, timeliness of publication and availability of a long time series with no breaks.

The OECD composite leading indicators (CLIs) are aggregate time series that show a leading relationship with the growth cycles of key macro-economic indicators (the average lead is six months). Typically, they are constructed to predict the cycles of total industrial production or gross domestic product in industry, which are chosen as proxy measures for the aggregate economy. OECD CLIs are calculated by combining component series in order to cover, as far as possible, the key sectors of the economy. These component series cover a wide range of short-term indicators, such as observations or opinions about economic activity, housing permits, financial and monetary data, etc. For each country, the series are selected according to the following criteria: economic significance; cyclical behaviour; data quality. Some transformations are required prior to aggregation, such as "smoothing", in order to reduce the irregularity of the final composite indicator. In general, for each country, component series of the CLI have equal weights. The aggregation of components series into the CLI reduces the risk of "false signals", changes in the indicator due to irregular movements that do not correspond to any later developments in the aggregate economy.

The OECD system of leading indicators is based on the "growth cycle" approach, which measures deviations from the long-term trend. A contractionary phase signals a decline in the rate of growth of the economy, though not necessarily an absolute decline in economic activity. This is distinct from classical cycles that are defined as a succession of periods of absolute growth and decline in economic activity. Peaks and troughs of growth cycles tend to appear earlier in time than those of classical cycles.

Figure 4.7.8 – **OECD leading indicator**



StatLink http://dx.doi.org/10.1787/336133143202

Note: The grey area represents downswings in economic activity.
Source: OECD (2008), *Main Economic Indicators*, OECD Publishing.

Further information

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OECD (2008), *Main Economic Indicators*, OECD Publishing.

Online databases

Business tendency and consumer opinion indicators
Composite Leading Indicators (MEI)
Industry and services statistics (MEI)
Labour Cost
Prices and Price Indices
Quarterly National Accounts
Available at *www.sourceoecd.org/database/oecdstat*.

Websites

http://stats.oecd.org/mei/
www.oecd.org/std/cli-ts
www.oecd.org/std/mei
www.oecd.org/std/labour
www.oecd.org/std/qna/statistics

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4.8 Labour statistics

Labour statistics come from both statistical surveys and administrative sources. Extremely important is the Labour Force Survey (LFS), carried out in almost all OECD countries at quarterly or monthly frequency, using definitions established by the International Labour Office (ILO). In most OECD countries, LFS covers the population aged 15 years and over. The choice of the 15-64 population as the working age population was made according to the accepted retirement age, but the proportion of persons working after 65 years varies from one country to the other. Differences in the lower limit also exist between countries.

On a monthly basis, the OECD publishes "standardised unemployment rates" (SUR). In EU countries, the LFS follows the Eurostat recommendations, which are a detailed version of the ILO guidelines. For other countries, OECD collects directly the data from NSOs. For those countries, the LFS follows ILO guidelines.

The Statistical Annex of the OECD *Employment Outlook* contains a lot of annual labour statistics, such as employment/population ratios; activity and unemployment rates, by gender, selected age groups and educational attainment; part-time employment; annual hours worked; long-term unemployment; and public expenditures and participant stocks in labour market programmes. The *2007 Employment Outlook* includes, for the first time, selected earnings-related indicators. Finally, this database contains a number of statistics on labour market performances and on features of the institutional and regulatory environment affecting the functioning of labour markets. Among these are the following: annual hours of work data for comparisons of trends over time; gross earnings by percentile for deriving measures of earnings dispersion for full-time workers by gender; gross mean and median earnings of full-time workers by age group and gender; statutory minimum wages; public expenditure on labour market programmes and number of participants; trade union density rates in OECD member countries.

▶ Key definitions

Total population: all nationals present in, or temporarily absent from the country, and aliens permanently settled in the country. It includes national armed forces stationed abroad; merchant seamen at sea; diplomatic personnel located abroad; civilian aliens resident in the country; displaced persons resident in the country. It excludes foreign armed forces stationed in the country; foreign diplomatic personnel located in the country; civilian aliens temporarily in the country.

Total labour force (or currently active population): comprises all persons who fulfil the requirements for inclusion among the employed or the unemployed as defined below. Civilian labour force corresponds to total labour force excluding armed forces.

Total employment: all persons (including armed forces), above a specified age, who during the reference period (either one week or one day), performed some work (at least one hour) for wage or salary (paid employment) or profit or family gain (self-employment), in cash or in kind, including those who have a job but were not at work (because of illness, vacation, etc.).

Unemployment: the unemployed comprise all persons above a specified age, who during the reference period were at the same time: *a)* without work (*i.e.* were not in paid employment or self-employment); *b)* currently available for work (*i.e.* were available for paid employment or self-employment); *c)* seeking work (*i.e.* had taken specific steps in a recent specified period to seek paid employment or self-employment). As the source is the LFS, this group is referred as "surveyed unemployed".

Registered unemployment: in all OECD countries, governments operate employment agencies at which unemployed persons of working age may register as a job seeker, regardless of whether they are covered by unemployment insurance. These unemployed job seekers are referred to as "registered unemployed". Such administrative statistics are sensitive to changes in regulations and consequently are not comparable through time and among countries. Nevertheless, in some countries they are the only unemployment data available on a monthly basis.

Participation rate: the ratio between the total labour force and the population. Since there is no international definition concerning the age range to take into account, for comparability reasons the OECD publishes participation rates: total labour force as a percentage of the total population; total labour force as a percentage of the 15-64 population. Participation rates calculated according to national definitions may take into account the age group represented in the labour force survey.

Employment rate: the ratio between the employed and the working age population (the OECD includes in this category persons aged 15-64). In addition to the employment rate as defined above, the OECD also publishes the ratio of employment as a percentage of the total population.

Unemployment rate: the ratio between the number of unemployed and the total labour force. Since members of the armed forces should, by definition, be included among persons in employment, total labour force should be used to calculate the unemployment rate in accordance with ILO recommendations. Nevertheless, to increase the comparability between OECD member countries, the OECD publishes the unemployment rate taking into account the civilian labour force.

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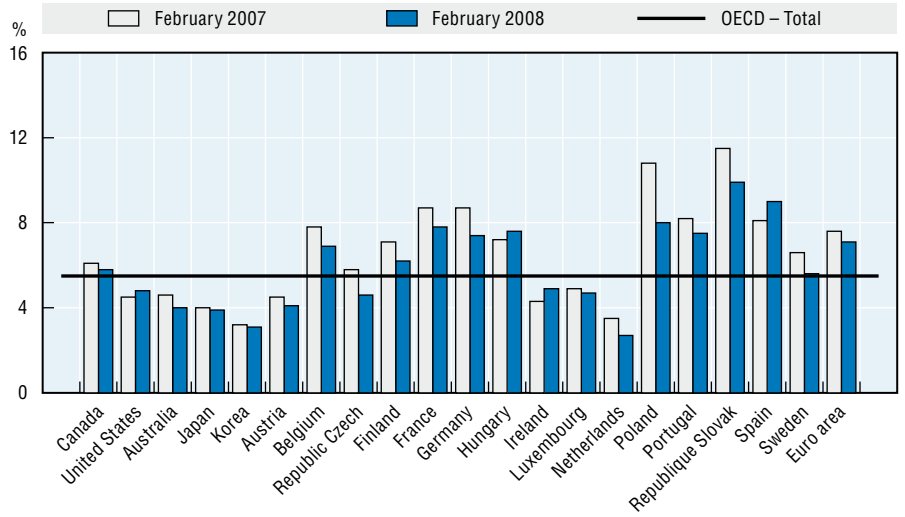
Figure 4.8.1 – **Unemployment rates**



StatLink http://dx.doi.org/10.1787/336140743402

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Online databases

OECD Employment and Labour Markets
Available at *www.sourceoecd.org/database/oecdstat*

Websites

www.oecd.org/statistics/labour
www.oecd.org/std/labour
www.oecd.org/els/employment

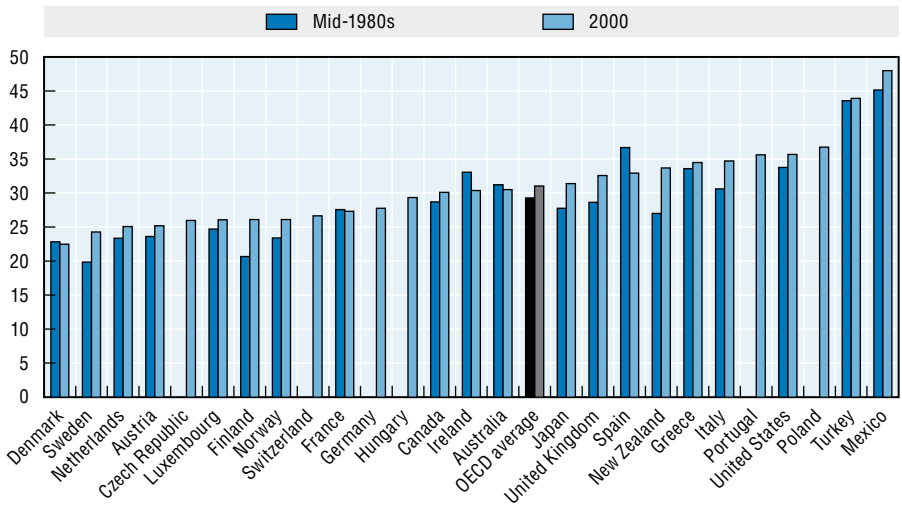
4.9 Income distribution and households' conditions

The distribution of incomes within a country is important for at least two reasons. Inequalities may create incentives for people to improve their situation through work, innovation or acquiring new skills. On the other hand, crime, poverty and social exclusion are often seen as linked to inequalities of income distribution. In the OECD Social Indicators database, some indicators of income distribution are computed, notwithstanding the serious comparability issues still existing in this field. Data were provided by national experts using common definitions. In many cases, however, countries have had to make several adjustments to their source data. Small changes between periods and small differences across countries are usually not significant.

In this context, income is defined as *household disposable income*, broadly following the definitions of the 1993 *System of National Accounts*. It consists of earnings from work, property income (such as interest and dividends), and pensions and other social security benefits; income taxes and social security contributions paid by households are deducted. The equality of disposable incomes among individuals is normally measured by the *Gini Coefficient*. This is a common measure of equality and ranges from 0 in the case of "perfect equality" (each share of the population gets the same share of income) to 100 in the case of "perfect inequality" (all income goes to the share of the population with the highest income). Household income is adjusted to take account of household size.

Figure 4.9.1 – **Distribution of household disposable income among individual**

Measured by Gini Coefficients



StatLink http://dx.doi.org/10.1787/336141325048

Source: Förster, M. and M. Mira d'Ercole (2005), "Income Distribution and Poverty in OECD Countries in the Second Half of the 1990s", *OECD Social Employment and Migration Working Papers*, No. 22, OECD Publishing.

There is considerable variation in levels of income inequality across OECD countries. For years around 2000, the Gini coefficient of income inequality is lowest in Denmark and Sweden, and highest in Mexico and Turkey – the two OECD countries with lowest per capita income. On average, across the 20 countries for which data are available since the mid-1980s, the Gini coefficient of income inequality increased from 29 to 31, but this increase may be within the margin of error for statistics on income distribution. The safest conclusion is that, for these 20 countries as a whole, there was little or no change.

There were, however, some striking changes for several countries when years around 2000 are compared with the mid-1980s. Household income distribution became markedly more equal in Spain and Ireland, and there were smaller reductions in inequality in Australia, Denmark and France.

At the other end of the scale, the Gini coefficients increased (greater inequality) by 10-20% in Norway, Japan, Italy and the United Kingdom and by over 20% in Sweden, New Zealand and Finland. Note, however, that despite the large increase in Sweden, the Gini coefficient is still one of the lowest in the OECD area.

In view of the strong demand for cross-national indicators on the situation of families, the OECD has recently developed a new *database on family outcomes and family policies* with indicators for all OECD countries. The database builds on indicators from different databases maintained by the OECD (for example, the OECD Social Expenditure database and the OECD Education database) and other international organisations. For some other indicators, for example about the use of parental leave or the use of out-of-school-hours care, information is derived from questionnaires sent by the OECD to member countries.

The OECD Family database aims to contain data on: the structure of families (size and composition, fertility patterns and marital and partnership status); the labour market position of families (employment status of family members, gender differences in employment conditions, workplace hours and time for caring); public policies for families and children (*i.e.* general tax/benefit support for families with children, public provisions for child-related leave, public spending on childcare and early education); child outcomes (child health, child poverty, education and literacy, social participation). By the end of 2008, some 30 to 35 indicators should be released, including: typology of childcare benefits; net parental fees by family type and income level; and trends in the income position of different household types. The first batch of indicators was released by the end of 2006, but work is ongoing on the preparation of new indicators for release throughout 2008.

Further information

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4.10 Monetary and financial statistics

This section highlights financial data collected by the OECD to support macroeconomic and financial markets analysis, as well as the preparation of policy advices. In particular, the following areas are covered: monetary aggregates, balance of payments and interest rates. All data are collected and disseminated in the context of *Main Economic Indicators*.

Monetary aggregates

Monetary aggregates measure the amount of money circulating in an economy. They are expressed in current prices ("nominal" terms) because the amount of money required by an economy reflects current levels of economic activity and price.

There are many monetary aggregates. Statistically, they are items on the balance sheet of the banking system. Although they may be taken from either side of the balance sheet (since credit series, which are banking assets, are sometimes labelled monetary aggregates), they are normally taken from the liabilities side. On the balance sheet, the liabilities items are ordered, starting with very narrow definitions of money (such as notes and coins) and gradually widening through various types of bank accounts (*e.g.* sight deposits, term deposits) to very broad items, which include sophisticated products like financial derivatives.

There were no internationally recognised standards for compiling monetary aggregates until the IMF published its Monetary and Financial Statistics Manual in 2000. Cross-country comparability suffered as a result. Now, notably, the European Central Bank's framework for constructing Euro area monetary aggregates is consistent with IMF principles and non-euro EU countries are also required to report data to ECB according to the framework, as are EU candidate countries as part of their application process.

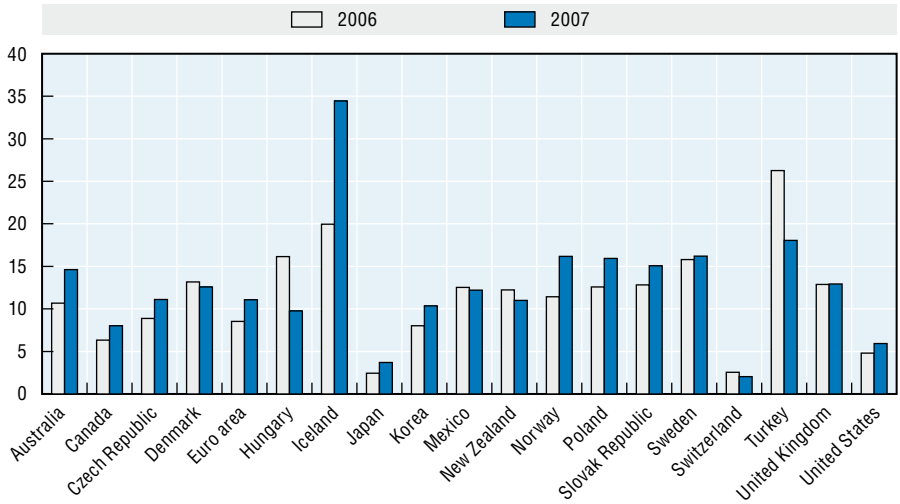
▶ Key definitions

Narrow money: covers highly liquid forms of money (money as a means of exchange). A general definition of narrow money (M1) is: currency, *i.e.* banknotes and coins, plus overnight deposits.

Broad money: includes the less liquid forms (money as a store of value). A general definition of broad money (M3) is: M1 *plus* deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months, repurchase agreements, money market fund shares/units and debt securities up to two years.

Figure 4.10.1 – **Broad Money**

Year-on-year growth rates



StatLink http://dx.doi.org/10.1787/336152123284

Source: OECD (2008), *Main Economic Indicators*, OECD Publishing.

Balance of payments statistics

The balance of payments is a statistical statement that provides a summary of economic transactions of an economy with the rest of the world, for a specific time period. The transactions are for the most part between residents and non-residents of the economy. The transactions include: goods, services and income; those involving financial claims on, and liabilities to, the rest of the world; and transfers. A transaction is defined as an economic flow that reflects the creation, transformation, exchange, transfer or extinction of economic value and involves changes in ownership, of goods or assets, the provision of services, labour or capital. Transactions are recorded using a double-entry method.

Balance of payments data are important for economic and monetary policy formation and analysis, both for short-term and structural information, as well as an indicator of monetary stability. Payment imbalances and trends in trade in goods and services, the current account, and in financial flows in inward and outward foreign investment attract particular attention. The balance of payments data also provide much detailed information and links to specialised statistical frameworks, such as those on international trade in services, and foreign direct investment.

Balance of payments data are compiled in accordance with the 5th edition of the Balance of Payments Manual published by the IMF (BPM5), and presented according to the Standard Presentation. There is virtually complete concordance in concepts between the balance of payments and the rest of the world account of SNA93. Closely related to the flows in the balance of payments framework is the international investment position (IIP), which

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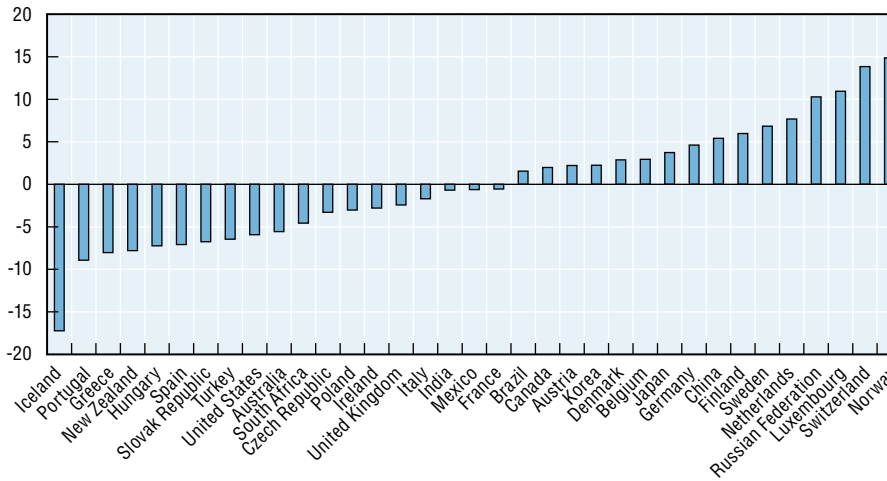
provides at a specific date, such as the end of a quarter, a statement of an economy's financial assets and liabilities, with their composition, vis-à-vis the rest of the world.

The OECD balance of payments dataset collects a limited set of the main flow variables, with a primary purpose of providing a timely OECD wide set of variables for short-term economic analysis. Data are collected from all member countries and important non-member economies. These main variables include:

- Current account (trade in goods, trade in services, income, current transfers)
- Capital account
- Financial account (direct investment, portfolio investment, financial derivatives, other investment, change in reserve assets)
- Net errors and omissions

Figure 4.10.2 – **Current account balance of payments**

As a percentage of GDP, average 2004-2006



StatLink http://dx.doi.org/10.1787/336178350458

Sources: For member countries and South Africa: OECD (2007), *Main Economic Indicators*, OECD Publishing. For Brazil, China, India and Russian Federation: National sources.

Interest rates

Interest rates are defined as the price paid for borrowing money and compensating the lenders for deferring their expenditures; simply stated, the interest rate is the cost of money and is expressed as an annual percentage. Many factors can affect interest rates, such as the supply and demand for money, the inflation rate, the amount, purpose and period of the transaction, the strength of the national currency, the pace of economic growth and government policy. As a consequence, there will be numerous rates applying to the large number of transactions in effect at any one time in any one

country. While efforts have been made by the OECD to select rates that ensure as much international comparability as possible, the fact remains that the institutional features of each country's financial markets are distinct and often markedly different from those of other countries.

▶ Key definitions

Immediate interest rate (or < 24hrs): used as a term to describe official discount rates and call-money rates. The official discount rate is the rate at which Central Banks make advances to, or discount eligible bills of exchange for, selected banks and other financial intermediaries. Day-to-day loans usually refer to operations on the money market between banks to balance temporary surpluses and shortages of liquidity. Call money generally refers to secured or unsecured "at-call" loans made by banks to money market dealers.

Short-term interest rate: usually either the three-month interbank offer rate or the rate associated with Treasury bills, Certificates of Deposit or comparable instruments, each with three-month maturity.

Long-term interest rate: the yield on 10-year government bonds, in most cases.

Interest rate spread: the difference between long-term interest rates and short-term interest rates. Usually, long-term interest rates are greater than short-term interest rates, and so the spread is positive, meaning that the longer the maturity of a bond, the higher its yield.

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Table 4.10.1 – Interest rates

February 2008

Country	Short-term interest rates	Long-term interest rates
Australia	7.69	6.29
Austria *	..	4.08
Belgium *	..	4.15
Canada	3.88	3.85
Czech Republic	3.94	4.48
Denmark	4.37	4.08
Finland *	..	4.06
France *	..	4.08
Germany *	..	3.95
Greece *	..	4.33
Hungary	7.73	..
Iceland	19.00	9.80
Ireland *	..	4.22
Italy *	..	4.35
Japan	0.76	1.43
Korea	5.28	5.28
Mexico	7.51	..
Netherlands *	..	4.05
New Zealand	8.82	6.40
Norway	5.91	4.39
Poland	5.94	..
Portugal *	..	4.27
Slovak Republic	..	4.36
Spain *	..	4.14
Sweden	4.21	4.02
Switzerland	2.80	3.06
United Kingdom	5.61	4.62
United States	3.06	3.74
Euro area	4.36	4.14

StatLink http://dx.doi.org/10.1787/336536361073

Note: Member of the Euro area are indicated with an asterisk.

Source: OECD (2008), *Main Economic Indicators*, OECD Publishing.

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Online databases

Main Economic Indicators.
OECD Economic Outlook Statistics.
Financial Indicators (MEI).
Available at *www.sourceoecd.org/database/oecdstat*.

Websites

www.oecd.org/eco/sources-and-methods
www.oecd.org/std/mei
http://stats.oecd.org/mei/

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4.11 National accounts

Since its foundation, the OECD has played a fundamental role in the development of national accounts, contributing to the preparation of guidelines and handbooks on specific issues, as well as to the various editions of the System of National Accounts (SNA). This section presents the wide range of data currently collected and disseminated by the OECD, as well as those compiled by the Secretariat. In particular, the following areas are covered: economic accounts (including the database on productivity and the STAN database developed for industrial analysis), input-output, financial accounts, quarterly national accounts and purchasing power parities. All together, the OECD databases concerning national accounts represent a unique source of comparable statistics for international and national analyses. Since 2005, a large part of national accounts databases are updated on a rolling basis, as soon as the data become available from national sources.

Economic accounts

There are three principal types of economic accounts published by national statistical offices: national accounts; balance of payments; and government finance statistics. The second two are essentially components of the first, but provide much more detail than is generally found in the national accounts, and they are dealt with elsewhere in this chapter.

The standards governing national accounts are enshrined in two international reference manuals: the *System of National Accounts 1993* (SNA 93), which is recognised globally, and the European version, the *European System of Accounts 1995* (ESA 95). The ESA 95 is consistent with the SNA 93 but is more prescriptive. The SNA 93 is published jointly by the United Nations, the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Co-operation and Development and the World Bank. An updated version of the SNA 93 is being developed and is scheduled for release in two parts in 2008 and 2009. An updated version of ESA 95 will follow.

The national accounts consist of an integrated set of macroeconomic accounts, balance sheets and tables based on internationally agreed concepts, definitions, classifications and accounting rules. Together, these principles provide a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy making.

The national accounts record production, consumption and the accumulation of wealth. They also record the income generated by production, the distribution of income among the factors of production and uses of the income, either by consumption or the acquisition of assets. When fully implemented, the national accounts record the value of an economy's stock of assets and liabilities at the beginning and end of a period (usually a year) and changes arising from production and transfers of income, as well as recording events that bring about changes in the value of the wealth stock. Such events can include revaluations, write-offs, growth and depletion of natural assets, catastrophes and transfers of natural assets to economic activity.

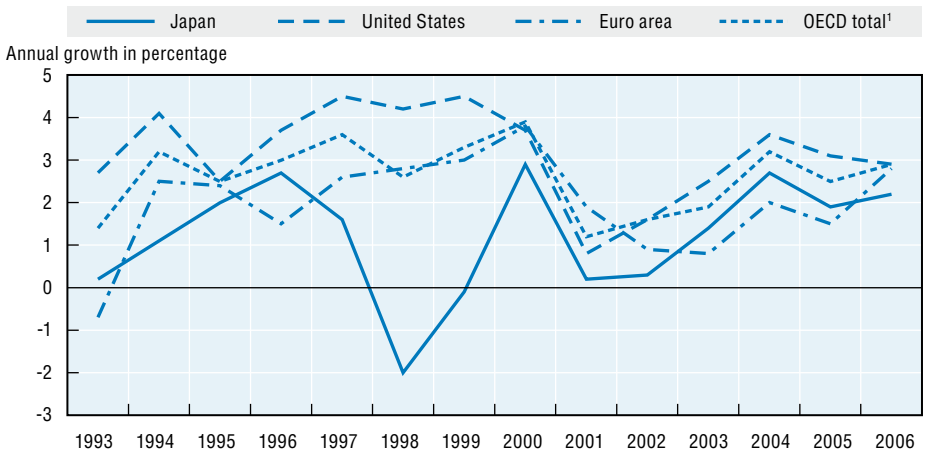
Accounts for the economy as a whole are supported by accounts for the various sectors of the economy, such as those relating to the government, households and corporate entities. The framework also embraces other, more detailed accounts, such as financial accounts and input-output tables. And it provides for additional analyses through social accounting matrices and satellite accounts designed to reflect specific aspects of economic activity, such as tourism, health and the environment. National accounting information can serve many different purposes. In general terms, the main purpose of national accounts is to provide information that is useful for economic analysis and the formulation of macroeconomic policy.

Of all the variables in the national accounts, the most prominent is gross domestic product (GDP). GDP is the standard measure of the value of goods and services produced by a country in its economic territory during a period of time (see Chapter 2 for a complete definition). Although it is a measure of production and not welfare, GDP has commonly been used as a proxy measure of the welfare of a country, but attention is increasingly being given to other factors. By removing price changes, a temporal volume measure of GDP shows how quickly production is growing over time. By taking account of price differences between countries, a spatial volume measure shows how production in one country compares with other countries. If either of these measures is divided by the number of persons in the population, GDP per capita is obtained, which is useful in making comparisons over time or between countries.

Figures 4.11.1 presents annual growth rates in the volumes of GDP for main geo-economic zones, while Figure 4.11.2 compares the level of GDP per capita for member countries in 2006.

Figure 4.11.1 – **Real GDP growth**

Annual growth in percentage



StatLink http://dx.doi.org/10.1787/336184823044

1. Excluding Czech Republic, Hungary, Poland and Slovak Republic.

Source: OECD (2007), *National Accounts of OECD Countries*, OECD Publishing.

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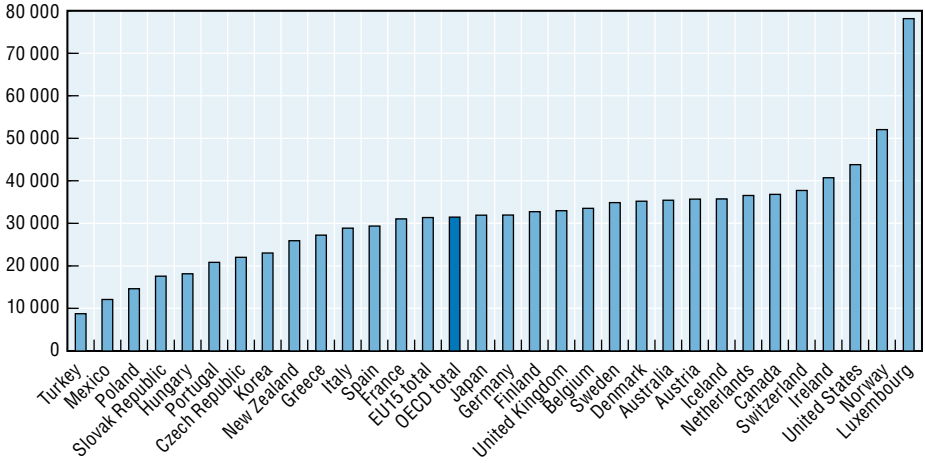
Figure 4.11.2 – **GDP per capita**

US dollars, current prices and PPPs, 2006 or latest available year



StatLink http://dx.doi.org/10.1787/336242075335

Source: OECD (2007), *National Accounts of OECD Countries*, OECD Publishing.

Handbook on the non-observed economy

To improve the exhaustiveness of GDP, the OECD, IMF, ILO and CIS STAT have published *Measuring the Non-Observed Economy: A Handbook*. The term "non-observed economy" (NOE) refers to those economic activities that should be included in GDP but are often not because they are not covered in the statistical surveys or administrative records from which the national accounts are constructed, namely:

- **Underground activities:** legal activities deliberately concealed from government to avoid paying taxes or social charges or to avoid the costs associated with legislation on safe working conditions or protection of consumers' rights. Sometimes, the activities are only partly concealed and may be reported to the tax authorities at lower-than-actual values, so as to reduce taxes rather than eliminate them entirely.
- **Illegal activities:** underground activities that involve the production or exchange of illegal goods and services, such as narcotics, prostitution, trade in stolen goods, smuggling and audio-video counterfeiting. Illegal activities should be included in the GDP providing they involve transactions between willing buyers and sellers. Theft, extortion and most kinds of fraud, for example, do not meet this definition and fall outside the production boundary.
- **Production of goods for own use:** these activities are usually legal but they may be omitted from the national accounts because there are no observable transactions between buyers and sellers since they are one and the same. In OECD countries, construction and maintenance of dwellings is probably the most important example of production for own use. In transition and developing countries growing ones own food is often an important activity.

Handbook on the non-observed economy *(cont.)*

- **Statistical deficiencies:** activities omitted simply because the statistical surveys and administrative records that provide the basic data for national accounts are incomplete. Sometimes this is by design: it may be impractical to cover every producer in a survey so a cut-off point is used to exclude the smallest enterprises. Otherwise, the problem arises from poor statistical practices: out-of-date or incomplete business register, inappropriate treatment of non-response, etc.

The *Handbook* explains various techniques to adjust GDP for the NOE in the short term, but the emphasis is on longer-term solutions. It develops a five-part strategy for measuring the NOE, with practical advice for each step. The ultimate aim is to upgrade the survey and administrative sources underlying the national accounts so that they cover the full range of economic activities included in the production boundary. Such a programme to improve the exhaustiveness of GDP will usually need to be part of an overall programme of statistical reform.

Productivity

Productivity is commonly defined as a ratio of a volume measure of output to a volume measure of inputs and measures how efficiently production inputs are being used in the economy to produce outputs. While there is no disagreement on this general notion, a look at the productivity literature and its various applications reveals very quickly that there is neither a unique purpose for, nor a single measure of, productivity. The two most commonly used measures of productivity are labour productivity and multi-factor productivity. Labour productivity is a single factor measure that relates output to the number of hours worked. Multi-factor productivity aims at capturing several factors of production. Typically, labour and capital input measures are combined into an indicator of combined inputs. Then, multi-factor productivity is measured as the ratio between output and combined inputs. More detailed explanations of productivity measures can be found in the OECD manual *Measuring Productivity* (2001).

There is a general understanding that productivity matters for the standard of living and economic growth, but to answer more specific analytical questions, different measures of productivity are required. In one way or another, the various productivity measures relate to the broader objectives of tracing technology, technical change and efficiency in the economy, in an industry or in a sector. More specific analytical reasons why the OECD is interested in the measurement of productivity include:

- productivity growth is considered a key source of economic growth and competitiveness, and as such it forms a basic statistic for many international comparisons and country assessments;
- productivity data are also used in the analysis of labour and product markets of OECD countries. For example, the OECD has analysed the links between productivity and product market regulation;

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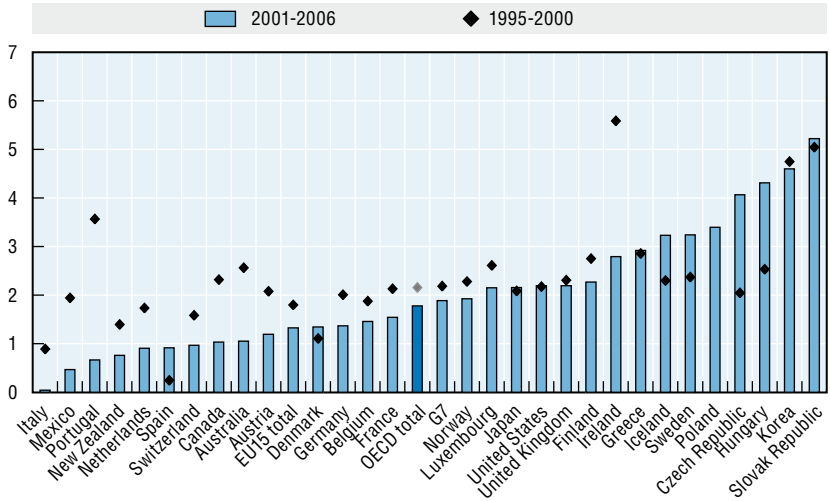
- productivity change constitutes an important element in modelling the productive capacity of OECD economies. This permits computation of capacity utilisation measures, themselves important in gauging the position of economies within the business cycle and for forecasting economic growth. In addition, the degree to which an economy's capacity is used informs analysts about the pressures from economic demand and thereby about the risk of inflationary developments.

Figure 4.11.3 – **Growth in GDP per hour worked**

Average annual growth in percentage, 1995-2000 and 2001-2006



StatLink http://dx.doi.org/10.1787/336281073661

Source: OECD Productivity Database.

The STAN database for industrial analysis

The STAN industry database provides analysts and researchers with a comprehensive tool for analysing industrial performance at a relatively detailed level of activity across OECD countries. It includes annual estimates of output, labour input, investment and international trade, from 1970 onwards, which allow users to construct a wide range of indicators to focus on areas such as productivity growth, competitiveness and general structural change. Through the use of a standard industry list, comparisons can be made across countries. The industry list provides sufficient detail to enable users to highlight high-technology sectors and is compatible with those used in other datasets in the STAN family, such as business expenditure on R&D, harmonised input-output tables and bilateral trade by industrial activity. Combining these datasets can help provide insights into the socio-economic and environmental impacts of increasing globalization.

STAN is primarily based on member countries' annual national accounts (SNA93) by activity tables, and it uses data from other sources, such as national industrial surveys/censuses, to estimate missing detail. Since many of the data points in STAN are estimated, they do not represent official member country submissions. The current version of STAN is based on the *International Standard Industrial Classification of all economic activities, Revision 3* (ISIC Rev. 3) and covers all activities (including services).

To meet the basic requirements of international research and analysis, STAN provides several variables, such as: production (gross output), intermediate inputs, value added, labour cost, wages and salaries, operating surplus, total employment, number of employees, hours worked, gross fixed capital formation (investment), capital stock, imports and exports. Variable coverage for each country depends on: whether national statistical offices compile the measures by industrial activity in the context of annual national accounts; the extent of *back estimates* made by national statistical offices after revisions of national accounts; and the availability of business survey/census data (for detailed sectors). Where possible and appropriate, STAN provides time series in both nominal terms (current prices) and real terms (volumes). More information is available at *www.oecd.org/sti/stan*.

Input-output tables

Input-output (I/O) tables describe the sale and purchase relationships between producers and consumers within an economy. I/O tables are estimated in the context of national accounts: some countries estimate annual I/O tables, while others do it every three or five years. I/O tables represent a fundamental tool for analytical purposes and they can be produced by illustrating flows between the sales and purchases (final and intermediate) of *industry outputs* or by illustrating the sales and purchases (final and intermediate) of *product outputs*.

The OECD I/O database is presented on the former basis, reflecting in part the collection mechanisms for many other data sources, such as research and development data, employment statistics, pollution data and energy consumption, which are in the main collected by establishments, and so industry. The 2006 edition of OECD I/O tables consists of matrices of inter-industrial transaction flows of goods and services (domestically produced and imported) in current prices, for 27 OECD countries (*i.e.* all

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OECD member countries except Iceland, Mexico and Luxembourg) and eight non-member countries (Argentina, Brazil, China, Chinese Taipei, India, Indonesia, Israel and Russia), covering the years from the mid-1990s to the early 2000s. Through the use of a standard industry list (based on 48 industrial sectors classified following the ISIC Rev. 3) comparisons can be made across countries. Moreover, the industry breakdown allows high-technology manufacturing activities, such as pharmaceuticals, computers, communication equipment and aircraft to be studied, although for some countries some of these sectors are not separately identified.

Many of the *industry-by-industry* input-output tables have been derived from member countries' supply-use tables, using the fixed-product sales structure assumption. Furthermore, some additional adjustments have been made to the supply-use tables, usually to deal with disclosure problems. As such, the input-output tables should not be regarded as official country estimates. If the supply-use tables are consistent with equivalent estimates in the National Accounts and the STAN Database, the I/O tables maintain this consistency. Not all countries, however, integrate their supply-use tables into the national accounts' production process, and therefore differences may exist on occasion.

The database is a very useful empirical tool for economic research and structural analysis at the international level. It highlights inter-industrial relationships and covers not only manufacturing but also services. When used in conjunction with other OECD databases on industrial structures (such as the STAN Database, the Business Research & Development Expenditures by Industry – ANBERD and the Bilateral Trade Database – BTD), it provides a tool for consistent economic analysis of growth, structural change, productivity, competitiveness and employment at both the sectoral and macroeconomic levels. Increasingly, I/O tables are also being used in environmental analysis, for example, to measure direct and indirect pollutants produced by industrial sectors within an economy, and importantly, "linkages" between economies.

Financial accounts and balance sheets

The financial accounts (flows) together with the financial balance sheets (stocks) form the full Financial Accounts, which belong to the System of National Accounts (SNA). In particular, the financial accounts are part of the accumulation accounts; they record, by type of instrument, the financial transactions between institutional sectors. The financial balance sheets, corresponding to the final sets of information of the accounts, record the stocks of financial assets and liabilities held by the institutional sectors, and give their net worth at the end of the accounting period.

The financial accounts permit analysts and policy makers to have a better understanding of the interactions between the "real" economy and the financial activities of OECD member countries. While, as a general rule, the financial accounts are to be recorded on a non-consolidated basis, consolidated accounts are also useful for certain types of analyses, such as deriving a better account of the financial position of the various economic players, in particular for financial corporations and for general government.

▶ Key definitions

Institutional sectors: composed of those institutional units capable of engaging in transactions with other units and grouped together into five main categories, some of which are divided into sub-sectors: *non-financial corporations*; *financial corporations*; *general government*; *households*; *non-profit institutions serving households* – NPISH. To these five sectors, which together comprise the *total economy* sector, is added the *rest of the world* sector, which reflects transactions and assets/liabilities vis-à-vis non-residents.

Transactions: describe the net acquisition of financial assets and the net incurrence of liabilities during the reporting year. The transactions accounts include a balancing item (net acquisition of assets less net incurrence of liabilities) and the final net lending(+) / net borrowing(-).

Stocks: correspond to the amount of financial assets and liabilities at a point in time. The stocks accounts also present a balancing item that corresponds to the net value (assets less liabilities).

Assets and liabilities: grouped into seven categories of instruments, most of them divided into sub-instruments, which are ordered according to their liquidity: *monetary gold and SDRs*; *currency and deposits*; *securities other than shares*; *loans*; *shares and other equities*; *insurance technical reserves*; and *other accounts receivable/payable*. All *assets* have a counterpart *liability*, except for monetary gold and SDRs.

Consolidated accounts: in these accounts, all transactions and stock positions between sub-sectors of the same sector, as well as between institutional units of the same sub-sector, are eliminated.

Quarterly national accounts

Quarterly national accounts are a central instrument for short-term analysis and have a very important role in economic policy making. This is because they provide timely indicators of economic developments and enable detailed analysis of the behaviour of economies around turning points in the business cycle. Annual accounts are very useful for structural analysis but tend to hide the pattern of growth around turning points because peaks or troughs in economic activity generally cut across years.

Business and government economists are the major users of quarterly national accounts data. Both analyse current trends and make short-term forecasts of economic developments, and contribute to the discussion and co-ordination of economic policies. Quarterly national accounts are much used by government economists in order to provide the macroeconomic framework for the government budget. Timely and reliable data are of the essence, although these two requirements are often in conflict with each other.

OECD Quarterly national accounts (QNA) comprise comparable macroeconomic data for all 30 member countries on a quarterly basis. They feed directly into the OECD Secretariat's modelling, forecasting and analytical work and are used by outside researchers for the same purpose. They are, however, less detailed than

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annual accounts, although countries have developed their quarterly accounts in a quite impressive way over the last six years.

Data are collected from countries on the basis of a standard questionnaire for European member countries and by various means for non-European member countries. All countries' quarterly accounts are now consistent with the 1993 System of National Accounts (1993 SNA).

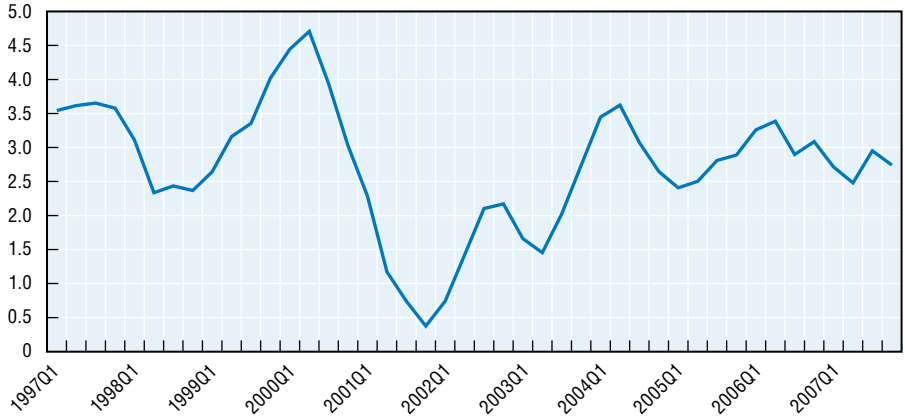
Most countries produce "chain" volume estimates, which are generally derived by first calculating values at previous year prices then chaining them together in order to produce continuous volume time series. These estimates provide better indicators of growth than estimates derived using a fixed-price structure, that is only revised every five or 10 years, as was commonly done by many member countries until quite recently.

Most countries produce seasonally adjusted quarterly series and some of them produce series that are also adjusted for variations in the number of working days. Unless they are forced to do so, the sum of the four quarters of seasonally adjusted/working-day adjusted data will not be equal to the corresponding annual series. Some countries do this, but others do not.

OECD QNA provide a selection of time series from countries' quarterly national accounts for the following accounts: gross domestic product components by expenditure, by cost structure and by industry; gross fixed capital formation by product and gross fixed capital formation by institutional sector; components of disposable income; saving and net lending/borrowing. They also comprise some area totals and a consistent set of volume and price indices.

Figure 4.11.4 – **OECD total, GDP volume**[1]

Percentage change on the same quarter of the previous year, seasonally adjusted data



StatLink http://dx.doi.org/10.1787/336285670358

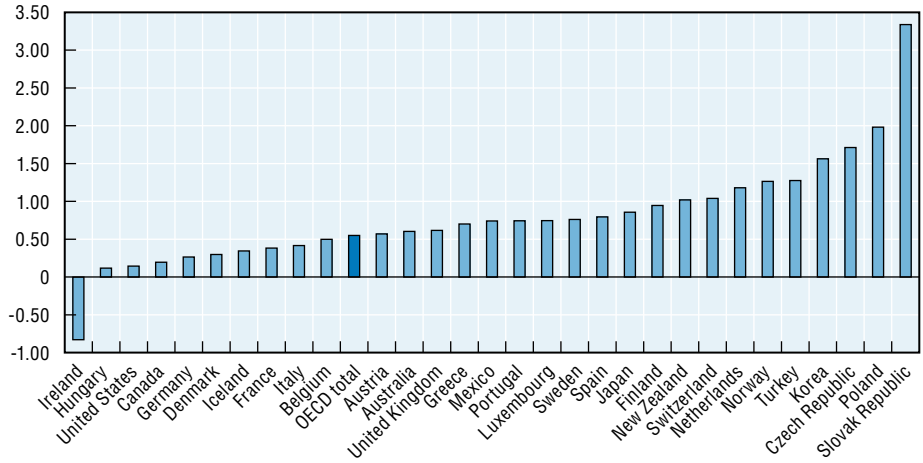
1. Derived from volume data converted into US dollars using fixed 2000 PPPs of GDP.

Source: OECD (2008), *Quarterly National Accounts*, OECD Publishing.

Figure 4.11.5 – **Quarterly GDP volume growth**

Fourth quarter 2007 or latest available quarter

Percentage change on the previous quarter, seasonally adjusted data



StatLink http://dx.doi.org/10.1787/336287662250

Source: OECD (2008), *Quarterly National Accounts*, OECD Publishing.

Purchasing power parities

How does one compare economic data between countries that is expressed in units of national currency? And in particular, how should measures of production and gross domestic product (GDP) be converted? The use of market exchange rates, while straightforward, turns out to be an unsatisfactory solution for many reasons – primarily because exchange rates reflect so many more influences than the direct-price comparisons required to make volume comparisons. Purchasing Power Parities (PPPs) do provide such a direct-price comparison, and this is the rationale for the work of the OECD and other international organisations in this field. PPPs are the rates of currency conversion that eliminate the differences in price levels among countries. They are both price converters and spatial deflators and are an adequate tool for making international volume comparisons of GDP and its main components.

Under the Joint OECD-Eurostat PPP Programme, the OECD and Eurostat share the responsibility for calculating PPPs. PPPs are calculated mainly using data collected specifically for the purpose. The Programme provides the framework for the collection and processing of data required to calculate PPPs. Since 1990, PPPs have been calculated every three years for member countries of the OECD and annually for EU countries.

PPPs are key statistical tools for international volume comparisons. However, there is a lack of understanding of the methodology and also of how, and when, PPPs should be used. The following box summarises how PPPs should be used.

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Recommended uses	• To make spatial volume comparisons of GDP (size of economies), GDP per head (economic welfare), GDP per hour worked (labour productivity) • To make spatial comparisons of comparative price levels • To group countries by their volume index of GDP per head and/or their comparative price levels of GDP
Uses with limitations	• To analyse changes over time in relative GDP per capita and relative prices • To analyse price convergence • To make spatial comparisons of cost of living • To use PPPs calculated for GDP and its component expenditures as deflators for other values, such as household income
Not recommended uses	• As precise measures to establish strict rankings of countries • As a means of constructing national growth rates • As measures to generate output and productivity comparisons by industry • As measures to undertake price level comparisons at low levels of aggregation • As indicators of the undervaluation or overvaluation of currencies • As equilibrium exchange rates

▶ Key definitions

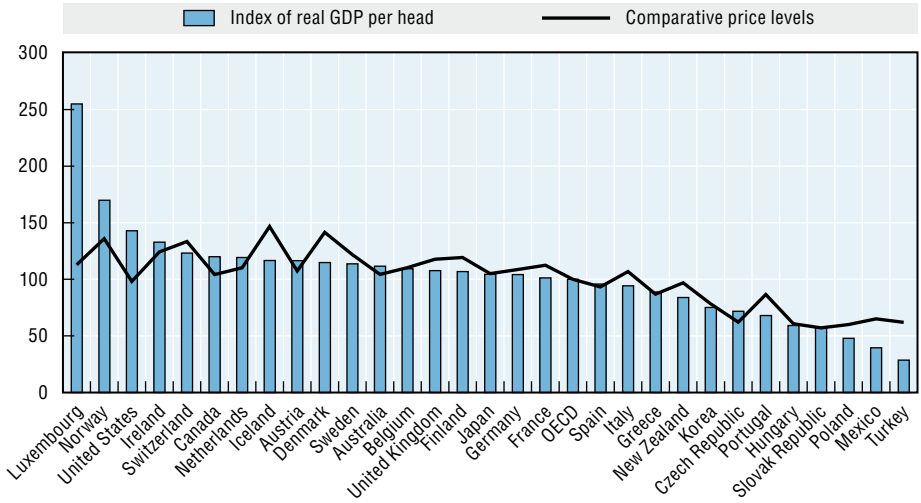
Indices of real final expenditure: volume measures that reflect the relative magnitudes of the product groups or aggregates being compared. At the level of GDP, they are used to compare the economic size of countries.

Indices of real final expenditure per head: standardised measures of volume that reflect the relative levels of the product groups or aggregates being compared after adjusting for differences in the size of populations among countries. At the level of GDP, they are used to compare the economic well being of populations.

Comparative price levels: ratio of PPPs to exchange rate. They provide a measure of the differences in price levels among countries by indicating for a given product group or aggregate the number of units of common currency needed to buy the same volume of the product group or aggregate in each country. At the level of GDP, they provide a measure of the differences in the general price levels of countries.

Figure 4.11.6 – **Comparative price levels and indices of real GDP per head**

OECD = 100, 2006



StatLink http://dx.doi.org/10.1787/336358623634

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www.oecd.org/std/ppp
www.oecd.org/std/qna/statistics
www.theworldeconomy.org

4.12 OECD Economic forecasts

In common with member government administrations and other public and private sector analysts, the OECD's Economics Department routinely monitors the world economy and in this context produces macroeconomic forecasts covering prospective world developments over a coming two-year period. The OECD forecasts include projections for key macroeconomic variables in each of it 30 member countries, as well as international trade and payments, and broad developments in key non-OECD economies and regions. An important feature of the exercise is the treatment of the world economy as a coherent and integrated whole, with individual country and regional assessments made under a consistent set of assumptions, giving particular attention to international consistency in trade and financial developments. Importantly, the OECD projections and the accompanying analysis have a clear focus on framing the policy debate in Member countries. The resulting forecasts are published twice a year in the *OECD Economic Outlook* and the associated OECD Economic Outlook database.

The OECD's macroeconomic projections are best characterised as being "conditional" rather than "pure" forecasts, since they depend on specific sets of assumptions including those about prevailing macroeconomic and structural policies, exchange rates and world commodity prices. Fiscal policy assumptions are based on current legislation, as well as announced measures and stated policy intentions when they are embodied in well-defined programmes with legislative support. Monetary policies are assumed to be set so as to achieve stated objectives, notably in relation to maintaining low inflation, and take into account monetary and financial market conditions and policy announcements. Nominal exchange rates against the US dollar are generally assumed to remain constant at the level prevailing on a pre-specified cut-off. Crude oil prices are typically assumed to remain constant in nominal terms based on average prices during the period leading up to the cut-of date; other commodity prices are typically assumed to remain constant in real terms.

Projections for individual OECD Member countries are, in general, made on a quarterly frequency and typically include:

- Main domestic demand components (consumption, investment and stock-building) as well as exports and imports, determining output (GDP) in "real" terms, as well as corresponding deflators and other important price measures;
- Labour market developments as summarised by employment, unemployment and participation rates and corresponding wage cost and earnings developments;
- Appropriation accounts for main institutional sectors;
- International trade and payments, including sub-balances of the current account, such as the balances on goods and services, foreign investment income and transfers.

A large number of other important macroeconomic variables are also included in the projections, including supply potential and output gaps, short- and long-term interest rates and indicators of world trade and competitiveness.

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Table 4.12.1 – Economic Outlook N.82, Summary of projections

	2007	2008	2009	2007 Q4	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	Fourth quarter 2007	Fourth quarter 2008	Fourth quarter 2009
	Per cent														
Real GDP growth															
United States	2.2	2.0	2.2	1.3	1.1	1.5	1.8	1.9	2.2	2.5	2.7	2.8	2.6	1.6	2.5
Japan	1.9	1.6	1.8	1.7	1.5	1.6	1.7	1.8	1.8	1.9	1.9	1.9	1.3	1.7	1.9
Euro area	2.6	1.9	2.0	1.7	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	1.9	2.0
Total OECD	2.7	2.3	2.4	2.0	1.9	2.0	2.2	2.3	2.5	2.6	2.7	2.7	2.6	2.1	2.6
Inflation															
United States	2.6	2.1	2.0	2.4	2.5	2.0	1.9	1.9	2.1	1.9	1.9	2.0	2.5	2.1	2.0
Japan	-0.5	-0.3	0.3	-1.0	-0.2	0.1	0.1	0.3	0.3	0.4	0.5	0.5	-0.8	0.1	0.4
Euro area	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.2	2.3
Total OECD	2.3	2.1	2.1	2.3	2.3	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.4	2.1	2.1
Unemployment rate[1]															
United States	4.6	5.0	5.0	4.8	4.8	4.9	5.0	5.1	5.1	5.0	5.0	4.9	4.8	5.1	4.9
Japan	3.8	3.7	3.6	3.8	3.8	3.8	3.7	3.7	3.7	3.6	3.5	3.5	3.8	3.7	3.5
Euro area	6.8	6.4	6.4	6.5	6.5	6.5	6.4	6.4	6.4	6.4	6.4	6.4	6.5	6.4	6.4
Total OECD	5.4	5.4	5.3	5.4	5.4	5.4	5.3	5.3	5.3	5.3	5.3	5.2	5.4	5.3	5.2
World trade growth	7.0	8.1	8.1	8.2	8.0	8.0	8.0	8.0	8.1	8.2	8.2	8.2	7.7	8.0	8.2
Current account balance[2]															
United States	-5.6	-5.4	-5.3												
Japan	4.7	4.8	5.2												
Euro area	0.2	-0.1	-0.2												
Total OECD	-1.4	-1.4	-1.4												
Cyclically-adjusted fiscal balance[3]															
United States	-3.0	-3.4	-3.4												
Japan	-3.4	-3.9	-3.6												
Euro area	-0.6	-0.6	-0.4												
Total OECD	-2.0	-2.2	-2.1												
Short-term interest rate															
United States	5.3	4.6	4.7	5.0	4.8	4.6	4.6	4.6	4.6	4.6	4.7	4.8			
Japan	0.7	0.6	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.8	0.9	1.2			
Euro area	4.3	4.2	4.1	4.7	4.4	4.2	4.1	4.1	4.1	4.1	4.1	4.1			

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1. Per cent of the labour force.
2. Per cent of GDP.
3. Per cent of potential GDP.

The assessment process uses a combination of analytical methods and expert judgment, involving a broad exchange of views among OECD country experts and topic specialists, also taking into account a variety of statistics and information based on econometric models of key macroeconomic relationships. International consistency is ensured through the use of the OECD's world trade model (Pain *et al*, 2005), and discussions between country and trade specialists.

In assessing the current near-term situation, particular weight is also given to separate models that make use of high-frequency indicators to provide estimates of GDP growth in the major OECD economies in the two quarters following the last quarter for which data has been published (Sédillot and Pain, 2005). These models incorporate high-frequency information released before the official national accounts data, including "soft" indicators, such as business and consumer surveys, and "hard" indicators, such as industrial production and retail sales, with use made of monthly and quarterly data and a variety of estimation techniques.

A further "reality check" on the OECD projections is provided by discussions with member country government experts and economic forecasters. While giving due consideration to the comments and suggestions from member countries, the projections and analysis published in the *Economic Outlook* reflect the independent assessment of world economic conditions by the OECD staff economists.

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4.13 Territorial statistics

Territorial statistics are an important tool in assessing the economic performance of regions and in evaluating regional development policies. While national averages can hide wide regional differences in economic conditions, regional statistics enable the identification of those regions that outperform their country as a whole and those that lag behind. The patterns of development may differ widely in urban and rural areas, and some areas may lag behind even when the national economy is performing well.

The word "region" can mean very different things both within and among countries. To address this issue, the OECD has classified regions within each member country into two Territorial Levels (TLs). The higher level (Territorial Level 2) consists of 335 macro-regions (*i.e.* for the US, it consists of 51 states) while the lower level (Territorial Level 3) is composed of 1 679 micro-regions (*i.e.* for the US it consists of 179 groups of counties). This classification – which for European countries is largely consistent with the Eurostat classification – facilitates greater comparability of regions at the same territorial level. Indeed, these two levels, which are officially established and relatively stable in all member countries, are used by many as a framework for implementing regional policies.

A second important issue for the analysis of regional economies concerns the different "geography" of each region. For instance, in the United Kingdom one could question the relevance of comparing the highly urbanised area of London to the rural region of the Shetland Islands, despite the fact that both regions belong to the same territorial level (TL3). To take account of these differences, the OECD has established a regional typology according to which TL3 regions have been classified as Predominantly Urban, Predominantly Rural and Intermediate. This typology, based on the percentage of regional population living in rural or urban communities, enables meaningful comparisons between regions belonging to the same type and level.

OECD regional statistics cover a wide range of topics, from demographic variables to economic accounts and from labour data to social and innovation indicators. Time series are available for 7 to 10 years periods according to the variable.

Regional statistics allow for the calculation of measures of concentration and disparity within countries. In 2003, Portugal. Sweden and the United Kingdom displayed the highest concentration of GDP, followed closely by Korea, Australia and Finland. GDP was more evenly distributed in the Slovak Republic, the Czech Republic and the Netherlands. During the period 1998-2003, concentration increased most in Hungary and Poland and decreased in the Czech Republic and Portugal. The largest regional disparities in labour productivity in 2003 were found in Mexico and Turkey, followed by the United States. According to this index, the countries with the smallest disparities were Sweden and Denmark. During the period 1998-2003, the Gini index increased the most in Australia, Ireland and Canada and decreased in Poland, the Slovak Republic and Spain.

▶ Key definitions

Index of geographic concentration: the geographic concentration index compares the geographic distribution ofGDP, for example, to the area of all regions. The index lies between 0 (no concentration) and 100 (maximum concentration). The value of the index is affected by the size of the regions; therefore, differences in geographic concentration between two countries may be partially due to differences in the average size of regions in each country.

Gini index of inequality: the Gini index measures the extent to which the distribution of employment among regions within an economy, for example, deviates from a perfectly equal distribution. The Gini index measures the area between the Lorenz curve and the hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. A Gini index of zero represents perfect equality, and 100 indicates perfect inequality.

The quest for an OECD definition of metropolitan regions

In assessing regional competitiveness policies governments are increasingly called to compare the economic and social performance of metropolitan regions across countries. The scope of what we can learn from this international comparison however is limited by the lack of a comparable definition of metropolitan region. Although almost each country has its own definition, these definitions vary significantly.

A first non-definitive methodology has been developed by the OECD for a comparable definition of metropolitan regions. This methodology is based on four criteria:

- The first criterion concerns the size of the population. A threshold of 1.5 million people is set to consider the region as metropolitan.
- Second, the density of population should exceed a critical value set at 150 people per km^2.
- Third, it is also fundamental that these regions with large and dense populations constituting urban areas represent a self-contained labour market. In order to define labour markets, commuting flows are used to calculate net migration rates. A region is considered metropolitan if the net commuting rate does not exceed 10% of the resident population.
- The fourth criterion has been set to include a small number of important cities in their national context. Therefore, cities with less than 1.5 million people, but that account for more than 20% of their national population, are included.

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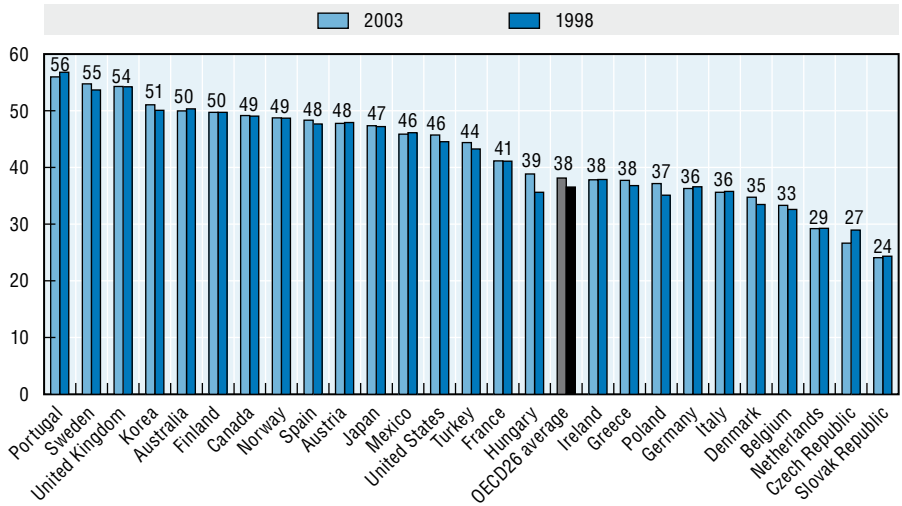
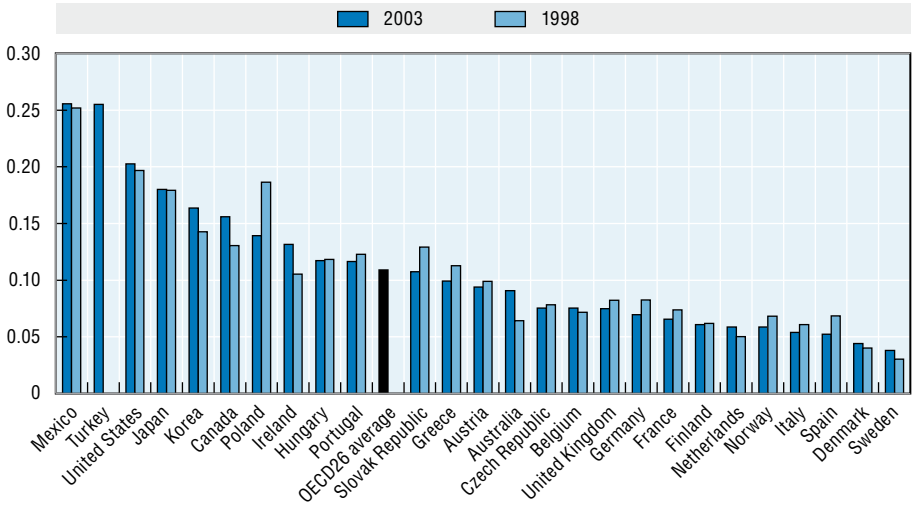
Figure 4.13.1 – **Index of geographic concentration of GDP**



StatLink http://dx.doi.org/10.1787/336418331644

Figure 4.13.2 – **Gini index of inequality of GDP per worker**



StatLink http://dx.doi.org/10.1787/336453644613

Source: OECD (2007), *OECD Regions at a Glance*, OECD Publishing.

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4.14 Economic history: long-term statistics of the world economy

The OECD has been collecting economic data for several decades now, and many key time series go back as far as the 1960s. However, for those studying the underlying causes and patterns of growth in the world economy, even half a century is too brief a period to be able to make meaningful analyses. In this respect, the OECD Development Centre has made some important contributions to the field of economic history. In particular the work of the respected economist, Angus Maddison, has been especially influential. Maddison's work presents and analyses quantitative data for key economic variables from as far back as 960AD, and covering all regions of the world. By bringing together this information Maddison aims to quantify long-term changes in world income and population in a comparable way, and as such, to begin to offer explanations. Obviously, the further into the past such investigations delve, the weaker the evidence and the greater the reliance on clues and conjecture. However, such exercises are useful and necessary as the differences in the pace and pattern of change in major parts of the world economy have deep roots in the past. The two Maddison's most influential statistical publications are:

The world economy

In this seminal work, Maddison brings together statistics on such variables as GDP, population, agricultural production, and merchandise exports, covering the past millennium. On the basis of comprehensive and detailed data, he argues that advances in population and income over the past millennium have been sustained by three interactive processes:

a) conquest or settlement of relatively empty areas which had fertile land, new biological resources, or a potential to accommodate transfers of population, crops and livestock;

b) international trade and capital movements;

c) technological and institutional innovation.

He shows that over the past millennium, world population rose 22–fold. Per capita income increased 13–fold, world GDP nearly 300–fold. This contrasts sharply with the preceding millennium, when world population grew by only a sixth, and there was no advance in per capita income.

From the year 1000 to 1820 the advance in per capita income was a slow crawl – the world average rose about 50 per cent. Most of the growth went to accommodate a fourfold increase in population. Since 1820, world development has been much more dynamic. Per capita income rose more than eightfold, population more than fivefold.

Chinese economic performance in the long-run

In this book Maddison provides a detailed analysis of the development of the Chinese economy over the past millennium and the prospects for the next quarter century. He demonstrates that Chinese per capita income was higher than that of Europe from the tenth to the early fifteenth century and it was the world's biggest economy for several centuries thereafter, before falling into decline. Its extraordinary progress in the reform period since 1978 has been a resurrection,

not a miracle and it is likely to resume its normal position as the world's number one economy by 2015. He applies standard OECD measurement techniques to estimate the pace of Chinese progress and finds somewhat slower growth, nearly 8 per cent a year rather than the 9.6 per cent of Chinese Bureau of Statistics. Instead of using the exchange rate to measure the level of Chinese performance, which greatly understates China's role in the world economy, Maddison uses purchasing power parity to convert yuan into US dollars and finds that China accounted for 5 per cent of world GDP in 1978, 15 per cent in 2003 and that this is likely to rise to 23 per cent in 2030.

Table 4.14.1 – **Comparative Levels of Economic Performance, China and Other Major Parts of the World Economy**

1700-2003

	China	Japan	Europe	United States	USSR	India	World
GDP (billion 1990 "international" dollars)							
1700	82.8	15.4	92.6	0.5	16.2	90.8	371.4
1820	228.6	20.7	184.8	12.5	37.7	111.4	694.5
1952	305.9	202	1 730.7	1 625.2	545.8	234.1	5 912.8
1978	935.1	1 446.2	5 268.2	4 089.5	1 715.2	625.7	18 969.0
2003	6 188.0	2 699.3	8 643.8	8 430.8	1 552.2	2 267.1	40 913.4
Population (million)							
1700	138	27	100.3	1	26.6	165	603.2
1820	381	31	169.5	10	54.8	209	1 041.7
1952	569	86.5	398.6	157.6	185.9	372	2 616.0
1978	956	114.9	480.1	222.6	261.5	648	4.279.7
2003	1 288.4	127.2	516	290.3	287.6	1 050	6 278.6
GDP per capita (1990 "international" dollars)							
1700	600	570	923	527	610	550	615
1820	600	669	1 090	1 257	688	533	667
1952	538	2 336	4 342	10 316	2 937	629	2 260
1978	978	12 585	10 972	18 373	6 559	966	4 432
2003	4 803	21 218	16 750	29 037	5 397	2 160	6 516

StatLink http://dx.doi.org/10.1787/336547300101

Table 4.14.2 – **Shares of World GDP**

1700-2003

	1700	1820	1952	1978	2003
China	22.3	32.9	5.2	4.9	15.1
India	24.4	16.0	4.0	3.3	5.5
Japan	4.1	3.0	3.4	7.6	6.6
Europe	24.9	26.6	29.3	27.8	21.1
United States	0.1	1.8	27.5	21.6	20.6
USSR	4.4	5.4	9.2	9.0	3.8

StatLink http://dx.doi.org/10.1787/336551023063

Source: OECD (2007), Development Centre Studies *Chinese Economic Performance in the Long Run – Second Edition, Revised and Updated: 960-2030 AD,* OECD Publishing.

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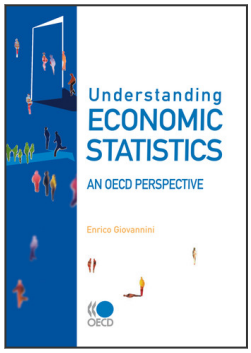

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