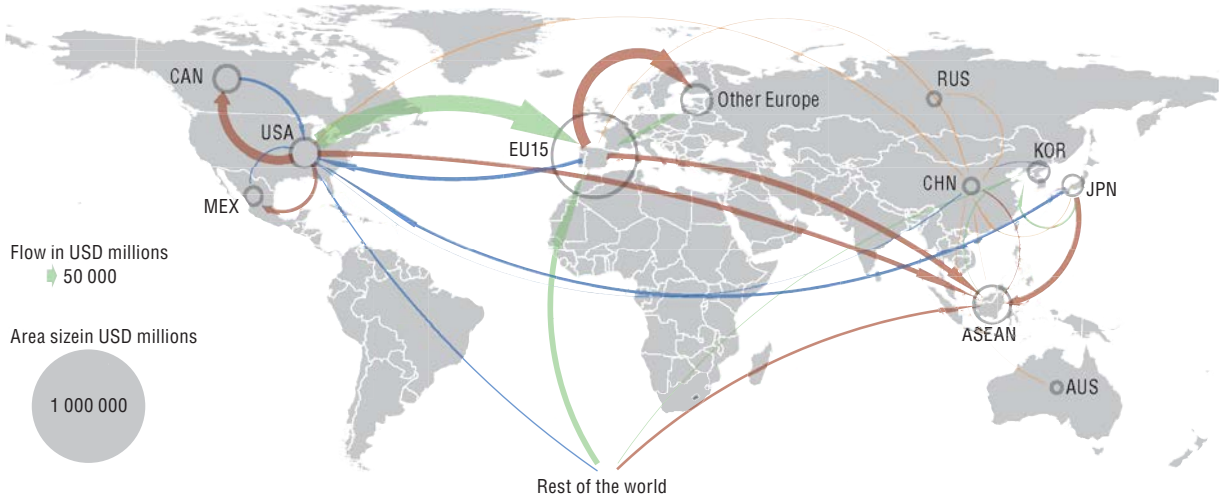
The new geography of growth

Evolving global value chains

The international fragmentation of production has expanded rapidly in the last two decades and production processes in many economies have specialised in specific tasks and activities. To understand this development it is not enough to compare direct imports to measures of domestic production. A producer that imports components may also purchase components from domestic providers that, in turn, use intermediate imports in their production processes. Moreover, imports may contain elements produced in the domestic economy. Developed in response to demand from policy makers, the OECD-WTO Trade in Value Added (TiVA) Database offers new insights on international trade patterns and dynamics. For example, indicators of the foreign value added content of exports reveal the extent to which countries have become more dependent on imports from a greater number of countries in order to maintain or improve their export performance.

30. Foreign value added content of exports, 1995

Selected flows, by source country/region, USD millions, at current prices



Source: OECD-WTO, Trade in Value Added (TiVA) Database, *http://oe.cd/tiva*, May 2013; map source: ARTICQUE© – all rights reserved. StatLink contains more data. See chapter notes.

StatLink *http://dx.doi.org/10.1787/888932889858*

How to read these figures

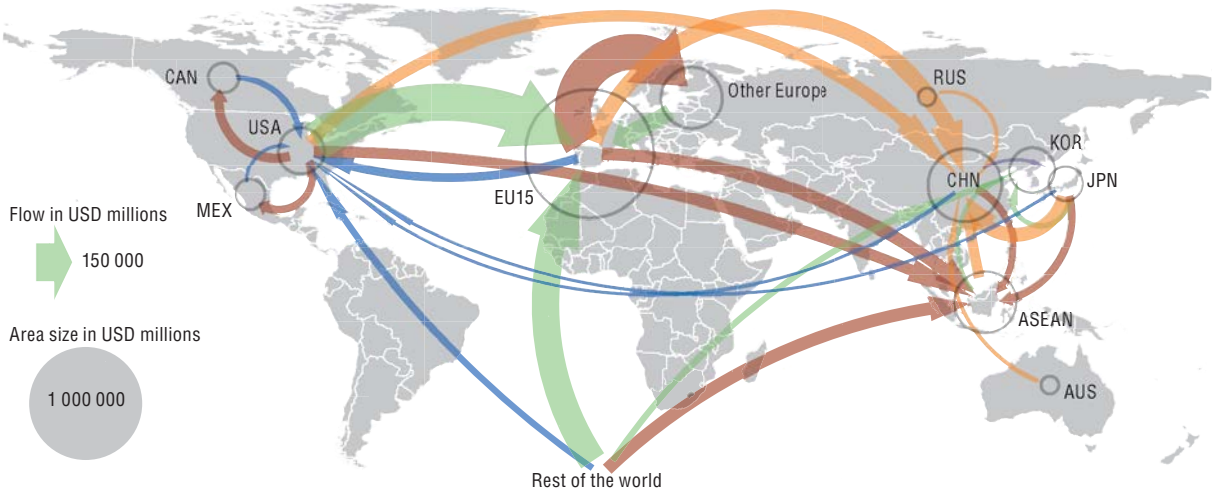
The size of the bubble represents the total amount of foreign value added embodied in an economy's or a region's total exports of goods and services for final demand (e.g. household and capital consumption). This is broken down to reveal the origin of the imported (intermediate) content (arrows). As the following figure for 2009 shows, the size of the bubbles and the thickness of the arrows increase considerably between 1995 and 2009, the latest available year in the TiVA Database, and demonstrate countries' increased dependency on imports.

Evolving global value chains

In most economies, the share of foreign value added in exports has increased in the last decade, a clear sign of the growing and evolving reliance on foreign intermediates in production. Among other factors, geography (proximity to markets), size of the economy (ability to source intermediates from domestic suppliers), and natural endowments of mineral resources all play a role. For example, in recent years China has increasingly relied on imports, notably from Europe, Japan and other OECD economies, to produce final goods for export. The foreign value added content of Chinese exports rose from 12% to 33% between 1995 and 2009.

31. Foreign value added content of exports, 2009

Selected flows, by source country/region, USD millions, at current prices



Source: OECD-WTO, Trade in Value Added (TiVA) Database, *http://oe.cd/tiva*, May 2013; map source: ARTICQUE© – all rights reserved. StatLink contains more data. See chapter notes.

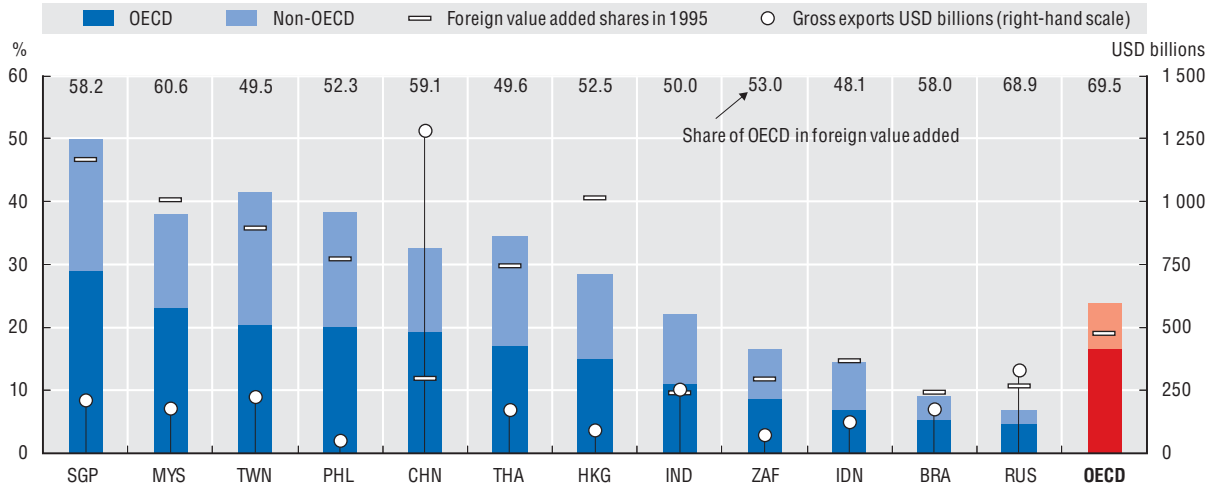
StatLink http://dx.doi.org/10.1787/888932889877

Evolving global value chains

The exports of countries with relatively open and liberal trade regimes and high shares of foreign direct investment are likely to have higher foreign value added content. The exports of larger economies that have significant mineral resources or are relatively far from foreign markets and suppliers tend to have relatively higher domestic (and lower foreign) value added content than those of smaller economies. Similarly, the exports of countries that specialise in activities upstream in the value chain, such as mining and agriculture, and those that specialise in services typically have higher domestic value added content. For the OECD area, foreign value added represented 24% of the value of gross exports in 2009, up from 19% in 1995. For the largest non-OECD exporters, it ranged from less than 10% in the Russian Federation and Brazil, where the weight of natural resources in exports is high, up to 50% in Singapore. In China, where gross exports increased about 12-fold at current prices to almost USD 1 300 billion, this measure of interdependence almost tripled to more than 30%, with 60% of the foreign value added of exports originating from OECD countries, half of which from Japan and Korea.

32. Foreign value added content of exports, non-OECD economies, 2009

As a percentage of total gross exports



Source: OECD-WTO, Trade in Value Added (TiVA) Database, *http://oe.cd/tiva*, May 2013. StatLink contains more data. See chapter notes.

StatLink *http://dx.doi.org/10.1787/888932889896*

How to read this figure

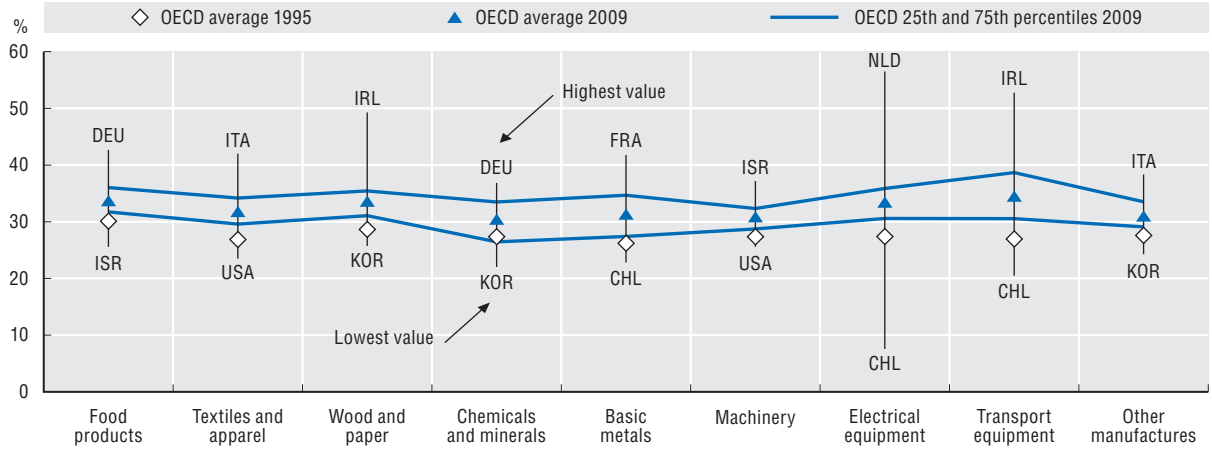
The height of the stacked bars represents the percentage of foreign value added included in gross exports in 2009. Economies are ordered according to the share of foreign value added originating from the OECD area. The right-hand scale indicates the value of gross exports in USD billions in 2009.

A new look at service trade

Services represent more than 70% of GDP in most OECD countries, while reported trade in services accounts for just over one-quarter of total international trade in goods and services. However, accounting for the value added by services in the production of goods reveals that the services sector plays a much more significant role in international trade, surpassing 50% of total exports in the United States, the United Kingdom, France, Germany and Italy. The OECD-WTO Trade in Value Added (TiVA) Database can provide insights into the role of services in global value chains by revealing, for example, the extent to which exports of manufactured goods depend on the inputs from various service activities that are required to produce them. In 2009, about a third of the value of OECD exports of manufactured goods could be attributed to services, a significant rise since 1995. Services content varies across industries and countries; electrical and transport equipment (high- and medium-high technology) manufactures have large shares of services content in many countries, often owing to business services such as IT services. Service content can be further split into domestic and foreign origin. Foreign services content in high- and medium-high-technology manufactures can represent between 40% and 50% of total services value added content.

33. Services value added in manufacturing exports by industry, 1995 and 2009

Range of values as a percentage of gross exports



Source: OECD-WTO, Trade in Value Added (TiVA) Database, *http://oe.cd/tiva*, May 2013.StatLink contains more data. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932889915

How to read this figure

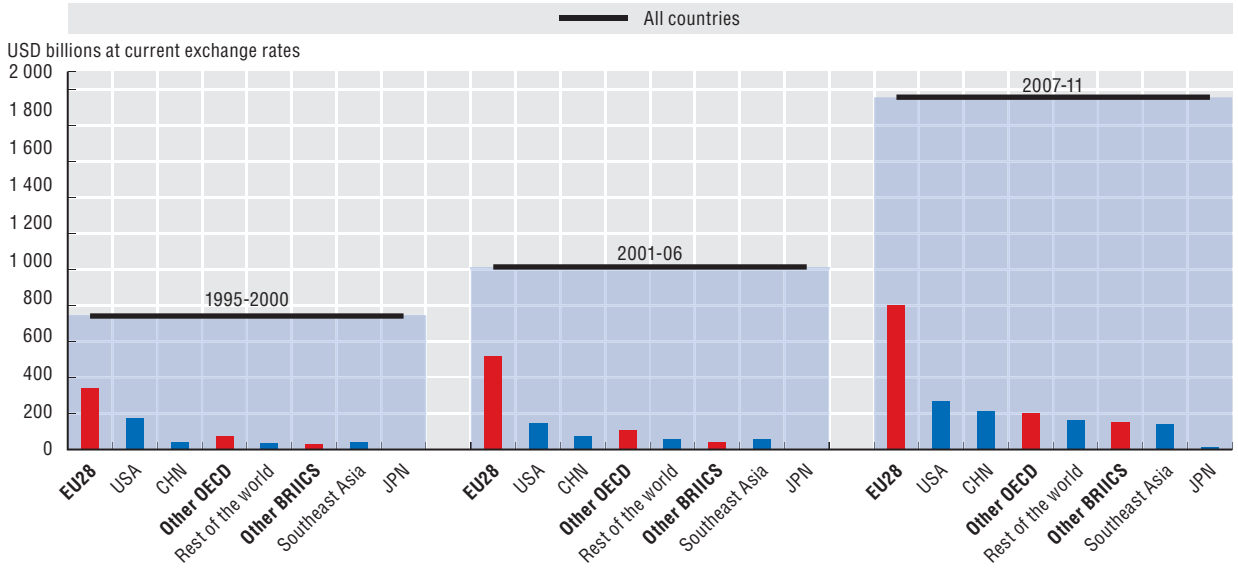
The indicator of services value added in manufacturing exports reflects the share of services value added in manufacturing production. The distance between 1995 and 2009 average values shows that the average content of services rose about 5 percentage points during the period to a value ranging from 30% to 35% across all industries. Half of the OECD economies (between the 25th and 75th percentiles) differ by only 5 to 10 percentage points. Lowest and highest country values in each industry are much more diversified, and their interpretation depends on the industry and the economy under consideration. Differences among countries are very small for machinery manufacturing but very wide for electrical equipment. For the latter, the share of services in the Netherlands' manufacturing exports largely concerns R&D and marketing services while Chile has very little manufacturing in this industry.

FDI shifting east

Foreign direct investment may provide recipient countries with access to new technologies and generate knowledge spill-overs for domestic firms and additional investment in R&D. In the last 15 years FDI flows have tripled. FDI inflows to Europe still exceed those to the rest of the world, but FDI flows to China and the rest of Southeast Asia have leapt from an average of about USD 81 billion a year in 1995-2000 to about USD 353 billion a year in 2007-11. According to preliminary OECD 2012 estimates, 44% of global FDI inflows were hosted by just five countries. China, with a five-fold increase in average annual inflows over 2008-11 became the largest FDI recipient in 2012, followed by the United States, Brazil, the United Kingdom and France. Rising global FDI outflows are driven by OECD countries and more than doubled between the early and late 2000s. At the same time, FDI by the BRIICS increased substantially as these economies became more integrated in the global economy.

34. Foreign direct investment inflows, 1995-2000, 2001-06 and 2007-11

Yearly averages

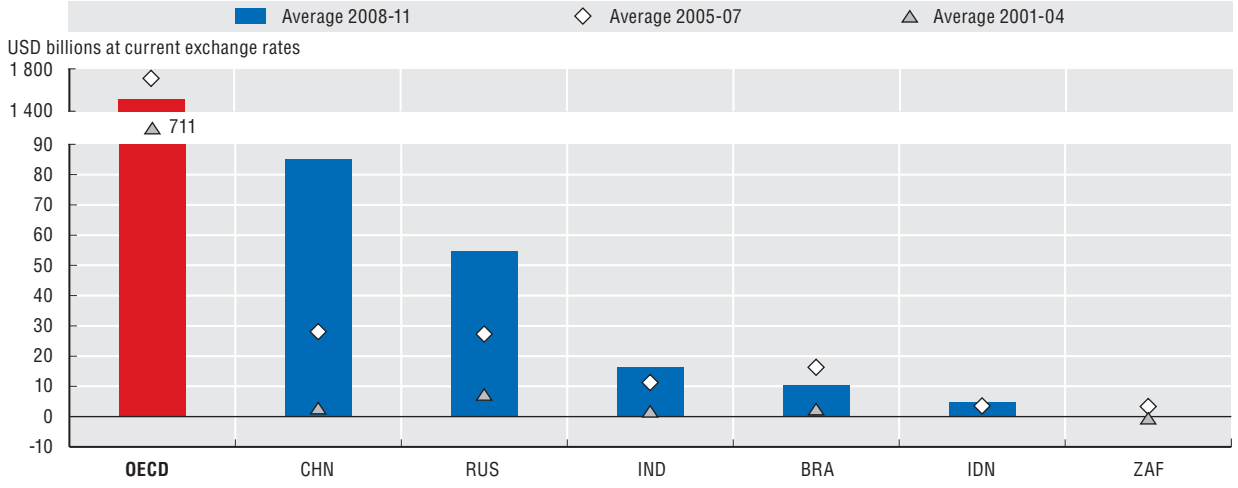


Source: IMF, Balance of Payments Database, June 2013. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932889934

35. Outward foreign direct investment flows from BRIICS, 2001-04, 2005-07 and 2008-11

Billions of USD, current exchange rates, yearly averages



Source: IMF, Balance of Payments Database, June 2013. See chapter notes.

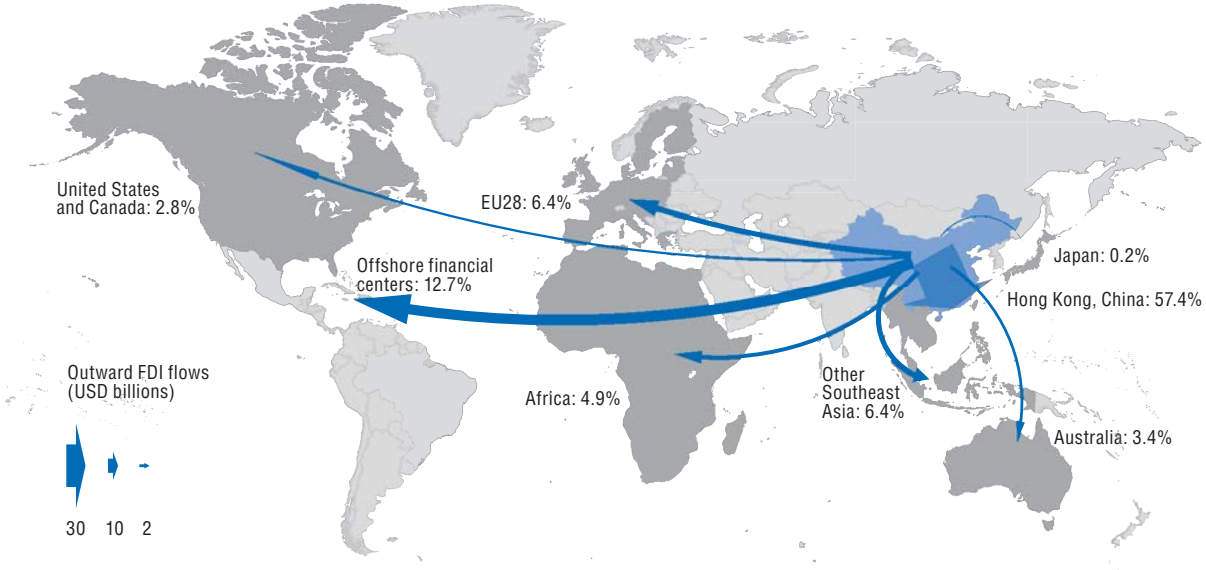
StatLink http://dx.doi.org/10.1787/888932889953

FDI shifting east

Average outward foreign direct investment (OFDI) from India increased more than nine-fold between the early and late 2000s while that of China increased 30-fold. Asia, and particularly Hong Kong, China, remains the largest recipient of Chinese investment, but the Caribbean countries also receive large amounts of Chinese OFDI. The routing via Hong Kong, China, and the Caribbean makes it difficult to build a reliable picture of the geographical distribution of China's OFDI. In terms of the stocks of inward and outward FDI, the United States remains the top investor and largest destination for FDI, with an inward stock of about USD 4 trillion, or about 20% of US GDP. Japan and Germany have the largest net active position, and Brazil is the largest net receiver. Besides Hong Kong, China, the top 20 economies measured by the sum of inward and outward positions include some very small economies such as Ireland, Singapore and the British Virgin Islands. Larger economies such as Italy and Japan attract little foreign investment, which contributes to their positive net FDI stock balance.

36. Outward foreign direct investment flows from China, yearly average 2007-11

USD billions at current exchange rates

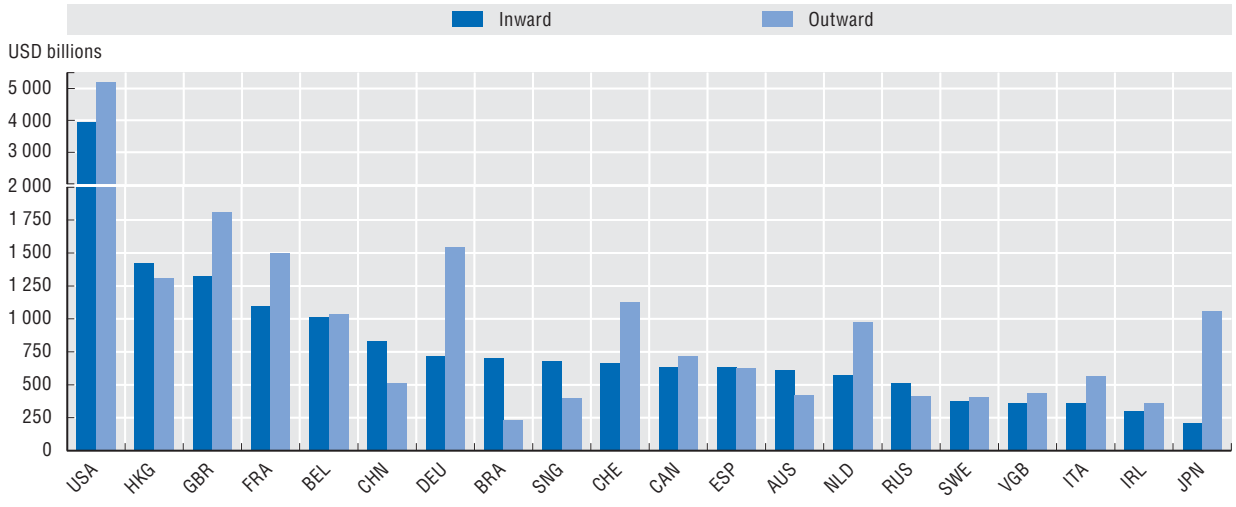


Source: OECD calculations based on Chinese Ministry of Commerce, *Statistical Bulletin of China's Outward Foreign Direct Investment 2011*. Map source: ARTICQUE© – all rights reserved. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932889972

37. Top 20 countries, total stock of foreign direct investment, 2012

Inward and outward positions, USD billions at current exchange rates



Source: UNCTAD, FDI/TNC Database, *www.unctad.org/fdistatistics*, July 2013. See chapter notes.

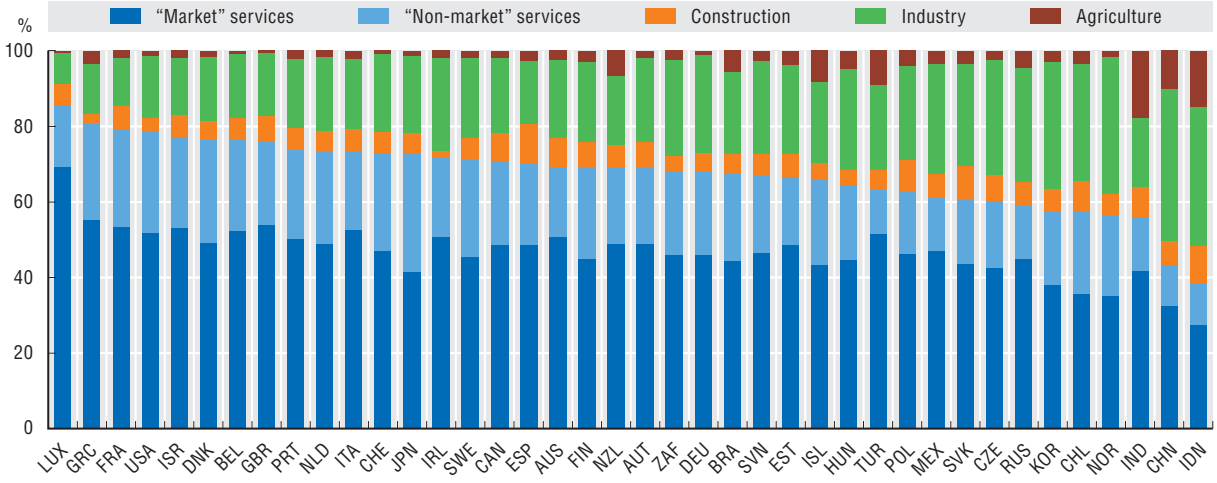
StatLink http://dx.doi.org/10.1787/888932889991

The structure of economies

As manufacturing production declines in OECD countries, the contribution of services to GDP rises: they now represent more than 70% of OECD value added and surpass 75% in eight OECD countries, including France and the United States. Even as manufacturing has expanded in the BRIICS in the last 20 years, natural resources continue to play a significant role in their economies, especially in the Russian Federation. Among OECD countries, Australia, Chile, Norway and Mexico rely heavily on natural resources.

38. Composition of GDP in OECD and BRIICS countries, 2011

Value added of major activity groups as a percentage of total industry value added

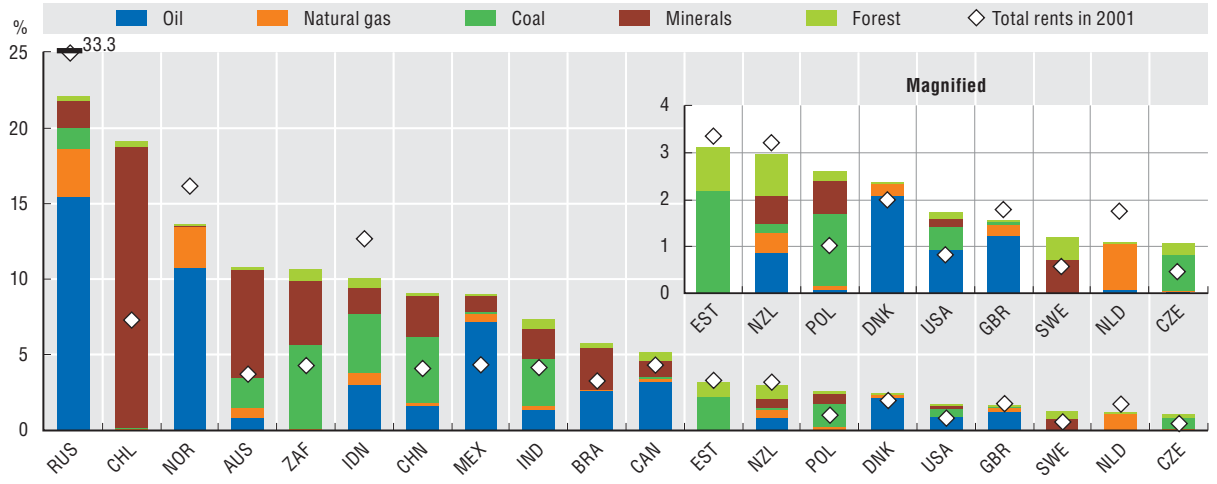


Source: OECD National Accounts (SNA) Database and Structural Analysis (STAN) Database, ISIC Rev.4; and national statistical institutes, June 2013. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932890010

39. Top 20 OECD and BRIICS countries reliant on natural resources, 2011

Natural resource rents as a percentage of GDP



Source: World Bank, World Development Indicators Database, June 2013. See chapter notes.

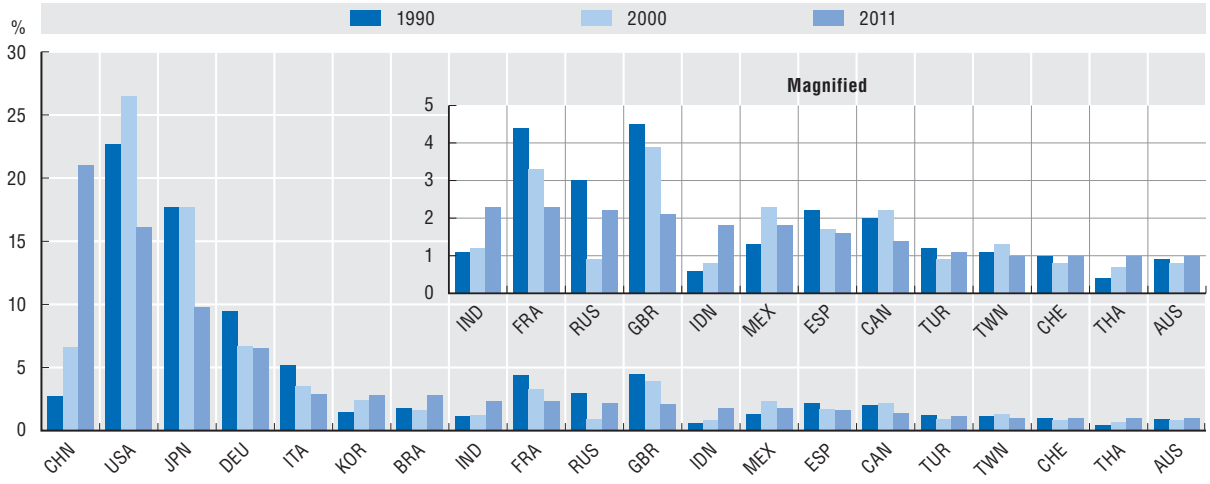
StatLink http://dx.doi.org/10.1787/888932890029

Top manufacturing players

Manufacturing has globalised over the last 20 years. In 1990, the G7 countries accounted for two-thirds of world manufacturing value added but now account for about 40%. In 2010, China passed the United States to become the world's leading manufacturer, and Brazil, India and Korea moved slightly ahead of France and the United Kingdom, two leading European manufacturers. China is also the top exporter of manufactured goods. However in value added terms, its lead over the United States is less clear. In fact, in 2009, the latest year available in the OECD-WTO TiVA Database, the share of the United States still exceeded that of China by a small margin. Japan and the United Kingdom also have higher shares of manufacturing exports in value added terms owing to their exports of high-quality parts and components that are subsequently embodied in other countries' exports.

40. Top manufacturers, 1990, 2000 and 2011

Percentage share of total world manufacturing value added

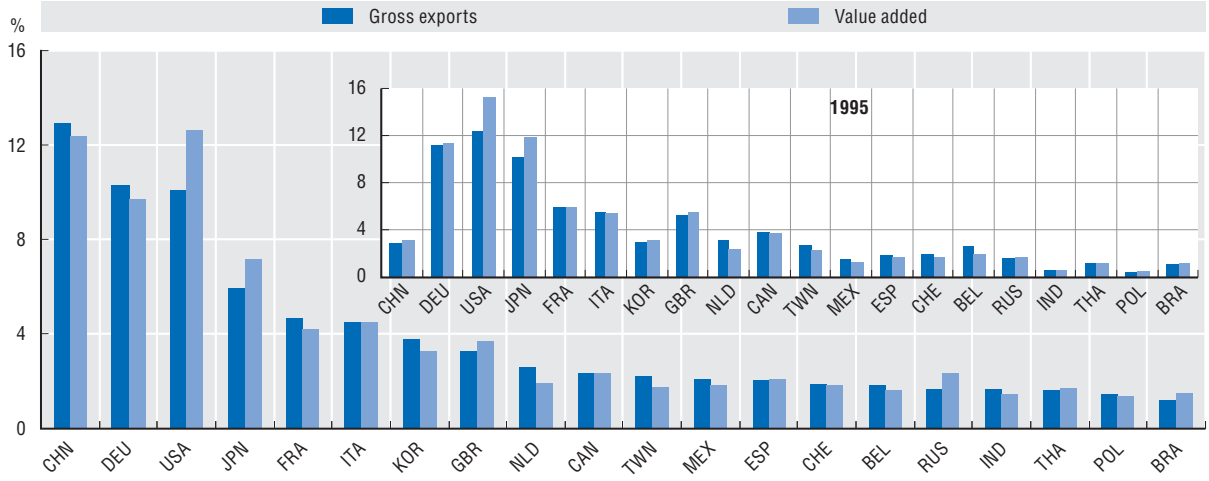


Source: United Nations Statistical Division (UNSD), National Accounts Main Aggregates, May 2013; OECD National Accounts (SNA) Database and Structural Analysis (STAN) Database, ISIC Rev.4, June 2013. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932890048

41. Top 20 exporters of manufactured goods in gross and value added terms, 1995 and 2009

Percentage shares of total world manufacturing goods



Source: OECD-WTO, Trade in Value Added (TiVA) Database, *http://oe.cd/tiva*, May 2013.

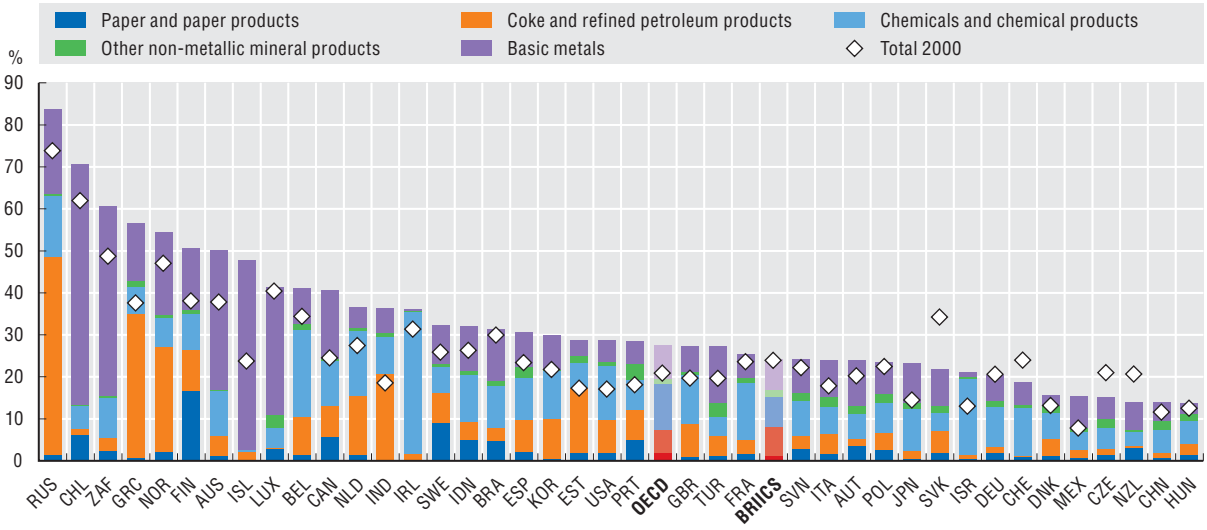
StatLink http://dx.doi.org/10.1787/888932890067

Relying on energy

Energy-intensive products make up over a quarter of total OECD exports of manufactures. For most OECD countries the share has increased since 2000, partly because of price increases in commodities. Energy-intensive does not necessarily mean carbon-intensive, but for many countries, industrial production is an area in which efforts to reduce the carbon content of output can still be made.

42. Exports from energy-intensive manufacturing industries, 2011

As a percentage of total manufacturing exports



Source: OECD, STAN Bilateral Trade Database by Industry and End-use (BTDIxE), May 2013. See chapter notes.

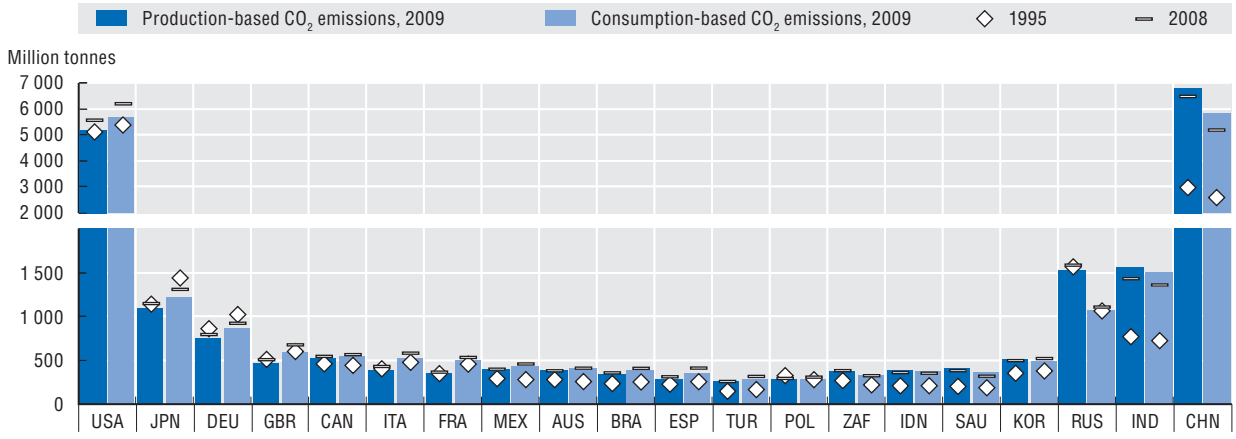
StatLink *http://dx.doi.org/10.1787/888932890086*

Growth and carbon emissions

The gains from growth, while distributed unevenly around the world, have been dramatic. Over the past 150 years life expectancy increased by around 30 years in most regions, including some of the world's least developed. The growth dynamic that has yielded these improvements in living standards has imposed substantial costs on the physical environment on which human well-being ultimately depends. It is increasingly apparent that the current use of natural resources could put higher living standards and even conventionally measured growth at risk. Without decisive action, energy-related emissions of CO_2 will double by 2050. Efforts to mitigate greenhouse gas (GHG) emissions, such as the Kyoto Protocol, will be less effective in reducing global emissions of GHG if countries with emission commitments source their carbon-intensive production activities from economies without such commitments, particularly if production in the latter countries is GHG-intensive.

43. Biggest net CO_2 importers and net CO_2 exporters, 2009

Estimates of production-based CO_2 emissions and consumption-based CO_2 emissions, selected countries, million tonnes



Source: OECD, Inter-Country Input-Output Database, May 2013. International Energy Agency (2013), CO_2 emissions from fuel combustion. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932890105

How to estimate imports and exports of CO_2

The OECD's input-output tables, bilateral trade in goods and services statistics, and energy statistics (e.g. fuel-combustion-based CO_2 and international electricity transfer), together with other industry statistics, can be used to estimate the effects of international transfers of CO_2 emissions. The results highlight differences among countries in production-based and consumption-based emissions. Consumption-based CO_2 emissions of OECD countries were, on average, about 15% higher in 2009 than conventional measures of production-based emissions would suggest. The divergence exceeds 25% in France, Italy and the United Kingdom. The magnitude of the difference increased in the late 1990s as trade in goods and services increased, except in Japan and Germany where both the production and the consumption of CO_2 emissions decreased between 1995 and 2009. The emissions structure of countries varies owing to differences in consumption activities, sources of electricity generation and the carbon intensity of imported goods. Electricity-sourced emissions are relatively high in emerging economies (e.g. China and India), whereas emissions due to transport activity and consumption of imported goods are relatively high in developed OECD economies (e.g. Japan and Germany).

Notes and References

Cyprus

The following note is included at the request of Turkey:

"The information in this document with reference to 'Cyprus' relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the 'Cyprus issue'."

The following note is included at the request of all the European Union Member States of the OECD and the European Union:

"The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus."

Israel

"The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

"It should be noted that statistical data on Israeli patents and trademarks are supplied by the patent and trademark offices of the relevant countries."

1. Labour productivity growth based on hours worked, total economy level, 2001-12

Euro area here excludes Cyprus and Malta.

2. Growth in GDP per capita and GDP per person employed in the BRIICS and the OECD, 2007-09 and 2009-12

Calculations are based on GDP at constant prices, converted to USD using 2005 purchasing power parities. GDP for Brazil, Indonesia and South Africa are from OECD, Quarterly National Accounts, April 2013. GDP for India is from OECD, Annual National Accounts, April 2013; the series was extended after 2009 using OECD, Quarterly National Accounts, April 2013.

Employment estimates for Brazil, China, India and Indonesia are based on GGDC, Total Economy Database, January 2013.

Employment data for South Africa are from OECD, Annual National Accounts, April 2013; the series was extended after 2010 using GGDC, Total Economy Database, January 2013.

3. Job recovery across socio-economic groups, 2008 Q1-2012 Q4

The skill dimension is based on ISCED97 as follows: low-skilled (ISCED97 0/1/2), less than upper secondary education; medium-skilled (IECD97 3/4), upper secondary education; high-skilled (ISCED97 5/6); tertiary education.

4. Harmonised unemployment rates, OECD, Euro area, United States and Japan, July 2008-April 2013

The OECD harmonised unemployment rates, compiled for all 34 OECD member countries, are based on the International Labour Office (ILO) guidelines. The unemployed are persons of working age who, in the reference period: are without work; are available for work; and have taken specific steps to find work.

Rates are seasonally adjusted.

Euro area here excludes Cyprus and Malta.

5. Net job growth, younger versus older firms, 2001-11

Establishments and firms that appear only for one year are excluded.

Mergers and acquisitions are not taken into account in determining firm age and firm exit.

The shares are calculated as shares of total employment, job destruction and job creation.

Small firms have between 1 and 49 employees, medium firms have between 50 and 249 employees, and large firms have more than 250 employees.

For Austria, data are at the establishment level.

For Japan, data are at the establishment level and refer to the manufacturing sector only.

For Austria, Italy, Luxembourg and Sweden, data refer to 2001-10.

For Brazil, data refer to 2002-10.

For France, data refer to 2002-07.

For Japan and New Zealand, data refer to 2001-09.

For Spain, data refer to 2003-09.

6. Employment, job creation and job destruction, by firm age and size, 2001-11

See notes under 5.

7. Employment, job creation and job destruction, manufacturing and services 2001-11

See notes under 5.

8. Where people lost their jobs, 2008-11

General note:

The aggregate activity groups are defined according to ISIC Rev.4 Divisions 01-03 (Section A), 05-39 (B-E), 41-43 (F), 45-56 G-I), 58-63 (J), 64-68 (K-L), 69-82 (M-N) and 84-99 (O-U).

Additional notes:

For Australia, calendar year averages from the Quarterly Labour Force Survey (QLFS), June 2013. Finance, insurance and real estate activities includes renting and hiring of machinery and equipment (77).

For Iceland, Annual Labour Force Survey (LFS) data by industry are used in the absence of employment by activity statistics published in an SNA context.

For Israel, estimates based on SNA employment data provided to OECD according to ISIC Rev.3. Professional, scientific, technical and other business services (69-82) includes Information and communication (58-63) and Finance, insurance and real estate activities (64-68).

For Japan, public administration, education, health and other services (84-99) includes Professional, scientific, technical and other business services (69-82).

For New Zealand, data are based on employment estimates for fiscal years 2008/09 and 2011/12. Agriculture, forestry and fishing (01-03) includes Mining and quarrying (05-09).

The OECD aggregate does not include Chile and Turkey.

9. Where people lost their jobs in Europe, 2011-12

See general note under 8.

10. Job creation and destruction in the information industries, 2008-11

To assess the effects of the economic crisis on employment across information industries, sectoral changes in levels of employment can be "normalised" in order to highlight their relative contributions, within each country, to the total change in information industry employment between 2008 and 2011. This is achieved, for each country, by expressing the sectoral changes as a percentage of the sum of the absolute changes.

The four activity groups comprising "information industries" are defined according to ISIC Rev.4 Divisions 26 (CI), 58-60 (JA), 61 (JB) and 62-63 (JC) respectively.

The gains and losses, in thousands, represent the sum of the aggregate sectors with positive changes and the sum of the aggregate sectors with negative changes, respectively. With a finer activity breakdown (such as 3-digit ISIC Rev.4), the estimates for total gains and losses could differ. For example, within the losses noted for Manufacture of computer, electronic and optical products (26), certain (3- or 4-digit) activities may have experienced gains in employment.

The employment data are measured in terms of persons except for Canada and the United States where number of jobs is the unit of measurement.

For Spain, IT and other information services (JC) includes Telecommunications (JB).

11. Change in the skill mix in Europe, services and manufacturing, 2011-12

Occupations are defined according to International Standard Classification of Occupations 2008 (ISCO-08). The following major groups are used 1) Managers, 2) Professionals, 3) Technicians and associate professionals, 4) Clerical support workers, 5) Service and sales workers, 7) Craft and related trades workers, 8) Plant and machine operators and assemblers, and 9) Elementary occupations.

Craft and related trades workers includes ISCO-08 major group 6, Skilled agricultural, forestry and fishery workers, which are reported by a few countries under manufacturing and business-sector services.

Manufacturing corresponds to ISIC Rev.4 (NACE Rev.2) Divisions 10-33 (Section C) while business-sector services cover Divisions 45-82 (G-N).

12. R&D growth over the business cycle by source of financing, OECD area, 1982-2012

Business and government-financed R&D expenditures are subcomponents of gross domestic expenditure on R&D (GERD), i.e. intramural R&D expenditures on R&D performed in the national territory. Funding sources are typically identified by the R&D-performing units.

Estimates for government R&D budgets are based on GBAORD (government budget appropriations or outlays for R&D) data for OECD countries with information available for 2012 (Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, the Slovak Republic, Slovenia and the United States). Rates of growth for this series only from 2008. Government budget data tend to be more timely but may not coincide with R&D performer-reported funding by government, owing to factors such as differences between budgetary plans and actual disbursements.

13. US GDP and trademark applications at the US Patent and Trademark Office, 2003-13

US GDP is based on the series of seasonally adjusted GDP, expenditure approach, in volume (chained volume estimates) contained in the OECD Quarterly National Accounts Database, June 2013.

The following aggregated fields based on the Nice Classification are used: Health, pharma and cosmetics: classes 3, 5, 10 and 44; Leisure and education: classes 13, 15, 16, 28 and 41; Advertising and business services: classes 35, 36 and 45; ICT and audiovisual: classes 9 and 38.

Raw GDP and trademark applications series were treated using the OECD's Composite Leading Indicators methodology. Monthly data were used for trademark applications and quarterly data for GDP, converted to a monthly frequency via linear interpolation and aligned with the mid-quarter month. This treatment removes seasonal patterns and trends (using the Hodrick-Prescott filter) in order to extract the cyclical pattern. The cyclical pattern presented on the graph is expressed as a percentage deviation from the long-term trend. Considering the filters applied, the remaining cycles are those with a period of between 18 months and 10 years. The analysis was performed on series from January 1990 to February 2013 for trademark applications and to March 2013 for GDP. For more information on the methodology, see OECD (2012), "OECD System of Composite Leading Indicators", *www.oecd.org/std/leading-indicators/41629509.pdf*.

The figure shows a peak around 2004 for the trademark series that does not correspond to economic activity. It corresponds to the accession of the United States to the Madrid Agreement in November 2003, which facilitated the filing procedure for foreign applications.

15. New enterprise creations, selected OECD countries, 2007-13

The trend cycle reflects the combined long-term (trend) and medium-to-long-term (cycle) movements in the original series.

For Australia, data exclude non-incorporated companies.

For Spain, data exclude natural persons and sole proprietors.

For the United States, data only refer to establishments with employees.

16. Trends in bankruptcies, 2007-11

For France, Norway and Spain, data refers to SMEs only.

17. Venture capital investment in the United States, 1995-2012 and in Europe, 1995-2010

Data for the United States refer to market statistics, data for Europe refer to industry statistics.

Europe includes Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Former Yugoslav Republic of Macedonia, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine and the United Kingdom.

18. Venture capital exits in the United States and Europe, 2007-12

Trade sale refers to the sale of company shares to industrial investors.

Initial public offering refers to the sale or distribution of a company's shares to the public for the first time.

Europe includes Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Former Yugoslav Republic of Macedonia, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom.

19. Patents by technology fields, 1999-2011

The data refer to counts of patent applications filed under the Patent Cooperation Treaty (PCT), at international phase, by priority date. Data for 2011 are estimates.

Patents in biotechnologies, nanotechnologies health- and ICT-related technologies are based on a selection of International Patent Classification (IPC) classes.

Patents in environment-related technologies are defined using combinations of IPC classes and codes Y02 of the European Classification (ECLA).

20. The dynamics of merchandise exports in OECD and non-OECD economies, 2000-11

Underlying values are in current USD. Data refer to manufactured goods and goods stemming from primary activities (i.e. agriculture, fishing, forestry, mining and quarrying); a few utilities, such as electricity and some community services, are also covered.

22. Worldwide collapse in exports, in gross value added terms between 2008 and 2009

Gross exports of goods and services are estimated from the underlying inter-country input-output (ICIO) system used to produce the OECD-WTO Trade in Value Added (TiVA) indicators. Of necessity, the system requires consistent bilateral trade matrices in which exports of products X from country A to B are equal to imports of products X by B from A. Efforts are made to ensure consistency with aggregate exports and imports as reported in countries' National Accounts or Balance of Payments statistics. However, because of the required balancing of global bilateral trade matrices, certain results may not match countries' perceptions of their trading patterns.

23. Trends in world foreign direct investment flows, 1995-2011

From 2005, data refer to the definition of FDI of the 6th revision of the *Balance of Payments Manual*.

The OECD share in world total is based on the average of inward and outward FDI flows.

24. Decomposition of growth in GDP per capita, 2007-09 and 2009-12

Calculations are based on GDP at constant prices, converted to USD using 2005 purchasing power parities.

For Australia, estimates refer to fiscal years beginning 1st July.

For New Zealand, underlying GDP series refer to fiscal years beginning 1st April.

25. Gap in GDP per capita and GDP per person employed in the BRIICS, with respect to the United States, 1997-2012

Calculations are based on GDP at constant prices, converted to USD using 2005 purchasing power parities.

26. Labour productivity growth in non-agricultural business sector before the crisis, 2001-07

General notes:

The contribution of each sector to aggregate labour productivity growth is computed as the difference between the growth rate of real value added and that of hours worked, weighted by the sector's share in total nominal value added and total hours worked, respectively.

The aggregate activity groups are defined according to ISIC Rev.4 Divisions 05-39 (Sections B-E), 41-43 (F), 45-56 (G-I), 58-63 (J), 64-66 (K) and 69-82 (M-N) respectively. Total non-agriculture business sector thus includes all activities except ISIC Rev.4 Sections A: Agriculture, forestry and fishing (Divisions 01-03), L: Real estate (68), and O-U: Public administration, education, health and other services (84-99).

Additional note:

Korean hours worked for 2001 are a Secretariat estimate which applies the 2004 industry distribution of hours worked to a 2001 total economy figure.

27. Labour productivity growth in non-agricultural business sector after the crisis, 2007-11

See general notes under 26.

28. Investment in fixed and knowledge-based capital, 2010

For Canada, Japan and Korea estimates refer to 2008.

Estimates refer to the business sector for all countries except Korea, for which estimates refer to the total economy. Value added in the business sector is adjusted to include knowledge-based investments.

Data on knowledge-based capital (KBC) for Australia provided by L. Talbott; all data for Canada provided by J. Baldwin, W. Gu and R. Macdonald; data on KBC and physical assets for members of the European Union, Norway and the United States provided by the INTAN-Invest consortium led by C. Corrado, J. Haskel, C. Jona-Lasinio and M. Iommi; all data for Japan provided by K. Fukao and T. Miyagawa; data on KBC for Korea provided by H. Chun. Data on tangible investment for Australia, Austria, Denmark, Finland, France, Ireland, Italy, Korea, Luxembourg, the Netherlands, Spain and Sweden and data on adjusted value added for Australia, Korea, Luxembourg and Portugal are OECD calculations based on OECD and Annual National Accounts Databases, May 2013.

29. Change in business investment intensity between 2008 and 2010

Estimates refer to the business sector for all countries.

Data on knowledge-based capital (KBC) for Australia provided by L. Talbott; data on KBC and physical assets for members of the European Union, Norway and the United States provided by the INTAN-Invest consortium led by C. Corrado, J. Haskel, C. Jona-Lasinio and M. Iommi. Data on tangible investment for Australia, Austria, Denmark, Finland, France, Ireland, Italy, Luxembourg, Netherlands, Spain and Sweden and data on adjusted value added for Australia, Luxembourg and Portugal are OECD calculations based on OECD and Annual National Accounts Databases, May 2013.

30. Foreign value added content of exports, 1995

Regional aggregations are as follows:

ASEAN: Brunei Darussalam, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam. The aggregate does not include Laos and Myanmar.

EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Other EU: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Iceland, Latvia, Lithuania, Malta, Norway, Poland, Romania, the Slovak Republic, Slovenia and Switzerland.

Rest of the world (world excluding TiVA countries, see *www.oecd.org/sti/ind/TiVA_Guide_to_Country_Notes.pdf*).

For the regions ASEAN, EU15 and Other Europe, intra-regional trade is included. For example, the arrow from USA to EU15 includes USA value added embodied in EU15 countries' exports to other EU15 countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

31. Foreign value added content of exports, 2009

See notes under 30.

32. Foreign value added content of exports, non-OECD economies, 2009

OECD calculated as a weighted average of OECD countries.

33 Service value added in manufacturing exports by industry, 1995 and 2009

The manufacturing activities covered are based on the following ISIC Rev.3 industries: 15-16 (Food products, beverages and tobacco); 17-19 (Textiles, wearing apparel, leather and related products); 20-22 (Wood, paper products, printing and publishing); 23-26 (Chemicals, pharmaceuticals, plastics and other non-metallic mineral products); 27-28 (Basic metals and fabricated metal products); 29 (Machinery and equipment); 30-33 (Electrical and optical equipment); 34-35 (Transport equipment); 36-37 (Other manufacturing and recycling).

Outliers were excluded from the computation of indices.

34. Foreign direct investment inflows, 1995-2000, 2001-06 and 2007-11

Data from 2005 to 2011 refer to the IMF (2009), Balance of Payments and International Investment Position Manual, 6th edition, definition of FDI. Data prior to 2005 refer to the IMF (1993), Balance of Payments and International Investment Position Manual, 5th edition definition of FDI.

Other OECD includes: Australia, Canada, Chile, Iceland, Israel, Korea, Mexico, New Zealand, Norway, Switzerland and Turkey.

Other BRIICS includes: Brazil, India, Indonesia, Russian Federation and South Africa.

Southeast Asia includes: Cambodia, Chinese Taipei, Hong Kong (China), Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

35. Outward foreign direct investment flows from BRIICS, 2001-04, 2005-07 and 2008-11

For Indonesia, the 2001-04 average is not available.

The IMF (2009), Balance of Payments and International Investment Position Manual, 6th edition definition of FDI is used for 2005-07 and 2008-11, IMF (1993), Balance of Payments and International Investment Position Manual, 5th edition definition for 2001-04.

36. Outward foreign direct investment flows from China, yearly average 2007-11

Offshore financial centres include Antigua & Barbuda, the Bahamas, the British Virgin Islands, the Cayman Islands, St Vincent & the Grenadines, and Bermuda.

Southeast Asia includes Brunei Darussalam, Cambodia, Chinese Taipei, Indonesia, Laos, Macau, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

37. Top 20 countries, total stock of foreign direct investment, 2012

Top 20 countries by the sum of inward and outward positions.

Countries are ranked by their inward position.

38. Composition of GDP in OECD and BRIICS economies, 2011

The major activity groups defined according to ISIC Rev.4 are: Market services: ISIC Divisions 45-82 (G-N); Non-market services: 84-99 (O-U); Industry: 05-39 (B-E), i.e. Mining (05-09), Manufacturing (10-33) and Utilities (35-39); Construction: 41-43 (F); and Agriculture: 01-03 (A).

Value added is measured in basic prices except for Indonesia and Japan (market prices) and India and the United States (factor costs).

For Australia data refer to the fiscal year ending June 2012.

For Brazil and Canada data refer to 2009.

For India data refer to the fiscal year ending March 2012.

For New Zealand data refer to the fiscal year ending March 2010.

39. Top 20 OECD and BRIICS economies reliant on natural resources, 2011

For Estonia, previous year data refer to 1995.

Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Rents are estimated as the difference between the value of production at world prices and total costs of production, including depreciation of fixed capital and return on capital.

40. Top manufacturers, 1990, 2000 and 2011

For Canada the 2011 share is based on a Secretariat extrapolation from official current price value added statistics available up to 2009.

For China the 2011 share is based on an estimate calculated by the United Nations Statistics Division and derived by applying the average 2008-10 share of manufacturing value added to total industry value added published for 2011.

42. Exports from energy-intensive manufacturing industries, 2011

The five industries considered are those included in ISIC Rev.4 Divisions 17, 19, 20, 23 and 24.

43. Biggest net CO_2 importers and net CO_2 exporters, 2009

Countries are listed by production-based CO_2 emissions, in descending order on the left-hand side, in ascending order on the right-hand side.

44. R&D in OECD and key partner countries, 2011

Figures for researchers are in full-time equivalent units.

For Brazil, Chile and the Netherlands, data refer to 2010.

For Iceland, Indonesia and South Africa data refer to 2009.

For Switzerland, data refer to 2008.

For Greece, data refer to 2007.

For Australia, data refer to 2010 for R&D expenditures and 2008 for researchers.

For India, data refer to 2007 for R&D expenditures and 2005 for researchers.

For Canada, France and Germany, data for researchers refer to 2010.

For United States, data for researchers refer to 2007.

Data for Brazil are provided by Brazil's Ministry of Science, Technology and Innovation. Data for India and Indonesia from the Science & Technology Statistics collected and published by the UNESCO Institute for Statistics. Owing to methodological differences, data for these countries may not be fully comparable with those for other countries.

45. Business R&D intensity and government support to business R&D, 2011

This is an experimental indicator. International comparability may be limited. For more information, see *www.oecd.org/sti/rd-tax-stats.htm*.

For Australia, Belgium, Brazil, Chile, Ireland, Israel and Spain, figures refer to 2010. For China, Luxembourg and South Africa, figures refer to 2009 and for Switzerland to 2008.

Estimates of direct funding for Belgium, France, Italy and Portugal are based on imputing the share of direct government-funded BERD in the previous year to the current ratio of BERD to GDP. For Austria, the 2009 share is used for 2011. For Brazil, the 2008 share, based on national sources, is used for 2010.

In Austria, Poland and South Africa, R&D tax incentive support is included in official estimates of direct government funding of business R&D. It is removed from direct funding estimates to avoid double-counting.

Estonia, Finland, Germany, Luxembourg, Mexico, New Zealand, Sweden and Switzerland did not provide information on expenditure-based R&D tax incentives for 2011. For Israel the R&D component of incentives cannot be separately identified at present.

Estimates do not cover sub-national and income-based R&D tax incentives and are limited to the business sector (excluding tax incentive support to individuals). Data refer to estimated initial revenue loss (foregone revenues) unless otherwise specified.

Estimates refer to costs of incentives for business expenditures on R&D, both intramural and extramural unless otherwise specified. Direct support figures refer only to intramural R&D expenditures, except for Brazil.

Country specific notes are available at *www.oecd.org/sti/rd-tax-stats.htm*.

46. Global Internet Protocol (IP) traffic, 2005-13

VoD: video on demand. WAN: wide area network.

2013: estimates.

47. IPv6 deployment by country, November 2012

Data collected on 19 November 2012.

48. Mobile cellular and broadband penetration worldwide, 2001-11

OECD series are computed with OECD data.

For Brazil, China, India and World, data are from ITU for mobile subscriptions and from the United Nations for population.

49. University hotspots, geographical distribution of highest impact institutions, 2007-11

Other OECD includes Australia, Canada, Israel, Japan, Korea, Mexico, New Zealand, Norway and Switzerland.

Other EU (and OECD) includes Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Poland, Portugal, Spain and Sweden.

Non-OECD includes Brazil, China, Chinese Taipei, Hong Kong (China), India, Iran, Lithuania, Malaysia, Singapore, South Africa and Thailand.

50. Innovation hotspots in ICT, biotechnology and nanotechnology, 1998-2000 and 2008-10

Data relate to patent applications filed under the Patent Cooperation Treaty (PCT) in ICT, biotechnology and nanotechnology. Patent counts are based on the priority date, the inventor's region of residence and fractional counts. The regional breakdown used is the OECD's Territorial Level 2.

51. Service-related trademark applications at USPTO and OHIM, selected OECD and non-OECD economies, 2000-02 and 2010-12

Shares of service trademarks are calculated using fractional counts of the classes designated in the trademark application. Classes 1 to 34 relate to goods; classes 35 to 45 relate to services.

Trademarks in knowledge-intensive services refer to applications in classes 35, 36, 38 and 42 of the Nice Classification. Trademarks in other services refer to applications in classes 37, 39, 40, 41, 43, 44 and 45 of the Nice Classification.

52. Trademarks in knowledge-intensive services, selected OECD and non-OECD economies, 2010-12

Shares of knowledge-intensive service trademarks are calculated using fractional counts of the classes designated in the trademark application. The following classes of the 10th edition of the Nice Classification are covered: class 35, business services; class 36, finance and insurance; class 38, telecommunications; and class 42, R&D.

53. Patents and trademarks per capita, 2000-02 and 2009-11

Patent families are counted using fractional counts and according to the earliest priority date (first patent application worldwide) and the inventor's country of residence.

Trademarks abroad are counted according to the application date and the address of the applicant.

55. The impact of scientific production and the extent of international scientific collaboration, 2003-11

The international institutional collaboration indicator is based on the proportion of documents involving institutional affiliations with other countries or economies, as a proportion of documents attributed to authors with an affiliation in the reference economy. Single-authored documents with multiple affiliations across boundaries can therefore count as institutional international collaboration.

56. The impact of internationally mobile scientists, inflows versus outflows, 1996-2011

International mobility of scientific researchers is inferred from authors listed in the Scopus Custom database of peer-reviewed scientific publications with at least two documents during the reference period, based on changes in the location of their institutional affiliation. Outflows are defined on the basis of their first affiliation. Inflows are defined on the basis of the final affiliation and exclude individual authors who "return" to their original country of affiliation.

A proxy measure of scientific impact for researchers with different mobility patterns is estimated by calculating, for each author and mobility profile, the median across the relevant journals' Source-Normalized Impact per Paper (SNIP) over the entire period. A SNIP impact value that is higher than one means that the median-attributed SNIP for authors of that country/category is above average.

58. The innovation-science link by technology area, 2001-11

To identify whether NPL corresponds to a scientific document, NPL references were matched to Thomson Reuters Web of Science database, an index of scientific literature. For matched references, scientific domains correspond to Thomson Reuters Essential Science Indicators 22-field classification (*http://archive.sciencewatch.com/about/met/fielddef/*). For presentational purposes, the fields are combined into a reduced set of 11 categories. Medical sciences encompasses clinical medicine, neuroscience, psychiatry and psychology. Life sciences covers biology and biochemistry, immunology, microbiology, molecular biology and genetics. Earth science includes geosciences and environment/ecology. Economics is included in social sciences. Other items are as indicated.

59. International collaboration in science and innovation, 2007-11

International co-authorship of scientific publications is defined at institutional level. A scientific document is deemed to involve an international collaboration if there are institutions from different countries or economies in the list of affiliations reported by single or multiple authors. Estimates are based on whole counts from information contained in the Scopus® database (Elsevier B.V.).

International co-inventions are measured as the share of patent applications filed under the Patent Cooperation Treaty (PCT) with at least one co-inventor located in a different country in total patents invented domestically. Patent counts are based on the priority date, the inventor's country of residence and whole counts.

60. Cross-border ownership of patents, 2009-11

The data refer to counts of patent applications filed under the Patent Cooperation Treaty (PCT), at international phase, by priority date, country and fractional counts.

61. Scientific collaboration with the BRIICS countries, 2001 and 2011

Numbers are based on whole counts.

North America includes the United States, Canada and Mexico.

Far East and Oceania includes Australia, Japan, Korea, Malaysia, New Zealand, Singapore and Thailand.

62. Co-inventions with the BRIICS countries, 1991-2011

Co-inventions are measured as the share of patent applications with at least one co-inventor located in a BRIICS country in total patents invented domestically.

Data refer to counts of patent applications filed under the Patent Cooperation Treaty (PCT), at international phase, by priority date, inventor's country of residence and whole counts.

63. Triadic patent families by blocs, 2001 and 2011

"Triadic" patent families refer to patents filed at the European Patent Office (EPO), the Japan Patent Office (JPO) and the United States Patent and Trademark Office (USPTO) that protect the same invention. Patent counts are based on the priority date, the inventor's country of residence and fractional counts.

Data for 2011 are estimates.

64. Technology transfers to selected BRIICS, 2005-09

Data refer to patent families, i.e. patents applied for at more than one patent office, one of which is among the following: Canadian Intellectual Property Office (CIPO, Canada); Companies and Intellectual Property Commission (CIPC, South Africa); Deutsches Patent- und Markenamt (DPMA, Germany); European Patent Office (EPO); Federal Service for Intellectual Property (ROSPATENT, Russian Federation); Institut National de la Propriété Industrielle (INPI, France); Instituto Nacional de Propriedade Industrial (INPI, Brazil); Japan Patent Office (JPO, Japan); Korean Intellectual Property Office (KIPO, Korea); State Intellectual Property Office of the People's Republic of China (SIPO, China); UK Intellectual Patent Office (UKIPO, United Kingdom); and the United States Patent and Trademark Office (USPTO, United States).

Patents are allocated to technology fields using the International Patent Classification (IPC) codes and the classification presented in Schmoch (2008, revised in 2013). Patent counts are based on the earliest priority date, the inventor's country of residence and fractional counts.

65. Gender differences in seeking health-related information on the Internet, 2011

Except where otherwise stated, the recall period is three months.

Averages are calculated using data from available OECD countries for which data are strictly comparable.

The national source for the Russian Federation is the Institute for Statistical Studies and Economics of Knowledge, Higher School of Economics (HSE) of the National Research University, May 2013.

For Canada, individuals aged 16 and over. Internet users are defined for a recall period of 12 months.

For Korea and New Zealand, data refer to 2012. Internet users are defined for a recall period of 12 months.

For Switzerland, data refer to 2010. Internet users are defined for a recall period of 6 months.

For the United States, data refer to May 2011 and are from the Pew Research Center. Percentages refer to adult Internet users (aged 18 or more) who have ever looked on line for health or medical information. There is no recall period.

66. Age differences in seeking employment-related information on the Internet, 2011

The recall period is three months, except for Canada, Chile, Japan and Korea (12 months), and the United States, which has no recall period (see note below).

The national source for the Russian Federation is the Institute for Statistical Studies and Economics of Knowledge, Higher School of Economics (HSE) of the National Research University, May 2013.

For Canada, data refer to 2010 and to search for employment only. The recall period is 12 months.

For Chile, data refer to 2012. Calculations for 16-64 year-olds are based on population figures for the group of individuals 15-64 years old.

For Japan, data refer to 2012 with different age groups: 15-59 year-olds, 15-19 year-olds and 50-59 year-olds.

For Korea data refer to 2012.

For the United States, data refer to May 2011 and are from the Pew Research Center. Percentages refer to adult Internet users (aged 18 or more) who have ever looked on line for information about a job. Internet users aged 18 or more instead of 16-64, 18-29 instead of 16-24 and 50-64 instead of 55-64.

67. Public perception of the impact of science and technology on personal well-being, 2010

For Japan and the Russian Federation, data refer to 2011.

For Korea, data refer to 2012.

For the United States, data refer to 2004.

For India, data refer to 2004.

Based on surveys conducted by means of face-to-face interviews. Results for Japan are based on web-based questionnaire.

Respondents in Japan, the Russian Federation and the United States were offered the following options (Strongly agree, Agree, Disagree, Strongly disagree, Don't know). Respondents in India were presented with three options (Agree, Disagree, Don't know). For Korea, only results for Strongly agree and Agree to some extent are available.

National sources within the following publications:

China: Ministry of Science and Technology of the People's Republic of China (2010). EU countries: European Commission (2010). Japan: National Institute of Science and Technology Policy (2011). Korea: Korea Foundation for the Advancement of Science and Creativity (2012). Russian Federation: National Research University – Higher School of Economics (2012). United States: National Science Board (2012). India: National Science Board (2012).

68. Public perception of scientific research benefits, 2010

For Japan and the Russian Federation, data refer to 2011.

For Korea, data refer to 2006.

Based on surveys conducted by means of face-to-face interviews.

For Japan, Korea, the Russian Federation and the United States, respondents were invited to choose among the following options: Benefits are much greater than harm, Benefits are slightly greater than harm, Benefits and harm are about equal, Harm is slightly greater than benefits, Harm is much greater than benefits, and Don't know.

For Brazil, respondents are asked to choose among the following options: Only benefits, More benefits than harm, Both benefit and harm, More harm than benefits, Only harm, and Don't know.

For EU countries and China, the question invited respondents to express their (dis)agreement with the statement, "The benefits of science are greater than any harmful effects it may have", by choosing among the following: Totally agree, Tend to agree, Neither agree nor disagree, Tend to disagree, Totally disagree, Don't know.

National sources within the following publications:

Brazil: Ministry of Science and Technology of Brazil (2010). China: Ministry of Science and Technology of the People's Republic of China (2010). EU countries: European Commission (2010). Japan: National Institute of Science and Technology Policy (2011). Korea: National Science Board (2012). The Russian Federation: National Research University – Higher School of Economics (2012). United States: National Science Board (2012).

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