Unit 2: Study Guide
Making cross national comparisons using macro data

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2.1 Introduction

This unit considers the use of ESDS International macro databanks in making cross national comparisons.

It looks at the institutional sources and management of the multinational data from the perspective of comparability; the formulation of international standards and common metadata. It looks at mechanisms, mostly from within ESDS International, to find and use such metadata.

It considers money as a unit of account that might be used as a common yardstick of comparison. In particular it looks at exchange rates and their use in transforming aggregated and disaggregated data into multi-nationally comparable series.

It considers environmental series and looks at some problems of comparability across their range. Examples and tasks are used to illustrate points.

2.2. Learning objectives

By the end of this module you will be able to:

- Use international macro data to undertake cross-national comparisons
- Understand some of the common methodological problems involved i.e. data quality and measurement issues.
- Identify which of the available databases are designed for cross-country comparative research

2.3. Nature of the ESDS International Macro-Databanks

This section looks at who collects data published on ESDS International macro databanks and how that collection is managed.

It introduces the main international organisations responsible for the data and its publication and discusses who is responsible for improving data standards. It emphasises the importance of checking metadata in making cross national comparisons and suggests ways that metadata can be accessed from within the ESDS International site and elsewhere.

It indicates who is responsible for the harmonisation of data series between countries in order to make more accurate cross national comparisons possible.

2.3.1. Who collects the data?

Who Collects Data for Cross-National Comparisons?

Most data in the ESDS International data-banks are collected and processed by national statistical agencies. They will be responsible to and mainly funded by their national governments. Data will be collected by surveys, censuses, commissioned and uncommissioned work by academic statisticians and social scientists and through government agencies responsible for taxation and customs matters, government departments, central banks and reputable commercial organisations. Some series will be produced by international agencies such as the World Health Organisation and others by international organisations/intergovernmental organisations (IGOs).

The statistical divisions of IGOs collate and publish data series from these sources. In cases where the IGOs produce their own series, this will always be done in collaboration with national statistical agencies, who will often undertake part of the task.

The statistical organisations of the IGOs are responsible for setting standards for the quality and integrity of statistical services, for the standardisation of metadata and for the production of cross-nationally comparable statistical series.

IGOs have international legal status, which differentiates them from NGOs (non-governmental organisations). The legal status is generally derived from the

formation of the organisation through treaty, though the exact nature of the treaty differs from organisation to organisation. Standards and comparability are often implemented by national laws and regulations through national adoption of IGO standards.

There is a strong de facto incentive for IGO standards to be adopted by national governments as both private and public cross-country financial arrangements such as:

- cross national loans,
- credit arrangements,
- cross national banking,
- direct and portfolio international investment,
- international trade arrangements etc.

These require credible statistical information, often so perceived by the extent of adoption and application of IGO standards and use of IGO accepted cross-national and comparable definitions and methodologies.

The most important IGO is the United Nations, whose **Statistical Commission** reports to the **Economic and Social Council** of the UN (whose members are periodically elected by the UN General Council itself). The Commission plays the lead role in setting standards and encouraging them to be disseminated and applied across the World. It commissions or encourages other IGOs to work on improving standards, metadata and comparability of data series. The Commission formally adopts standards, metadata and new revisions of major data sets at the level of national accounts, industrial classification etc... The work of the Commission is carried out by the **United Nations Statistical Division (UNSD)**. The Division itself publishes key World, regional and national data-sets.

The other IGOs whose data-banks are published on the ESDS International macro data base are:

- International Monetary Fund (IMF)
- World Bank
- Organisation for Economic Co-operation and Development (OECD)
- European Union - Eurostat

- International Labour Organisation (ILO)
- International Energy Authority (IEA)

The IEA was formed from within the OECD and continues to work closely with it as an autonomous agency. Eurostat is the statistical organisation of the European Union and is responsible to the European Commission.

As well as their specialisms, the statistics divisions of the World Bank, OECD and Eurostat work in cooperation on issues relating to the cross-national comparability of economic, social, demographic, energy and other statistics.

Activity 1 : Quiz

Answer the following questions to test yourself on what you have learnt so far

- What differentiates Intergovernmental Organisations (IGOs) from Non-governmental organisations (NGOs)?
- Which IGO plays the lead in setting standards for the quality and integrity of statistics and statistical services?
- Which organisations have databases published in the ESDS International macro-database?

Answers are available at the back of this study guide.

2.3.2. Who sets, monitors and changes data standards?

Setting the standard - how good is the data contained in databanks?

Standards for data have been an issue for a number of years amongst international statisticians. In 1994 the United Nations specified a set of general criteria that a system of official statistical should meet - http://unstats.un.org/unsd/goodprac/bpabout.asp.
These have been developed and applied by a number of leading international organisations. Clearly, the higher the standard of data, the easier cross national comparison becomes. The IMF, for example, encourages countries to use their **Special** or **General** Data Dissemination System (SDDS for countries agreeing to enhanced standards or GDDS for those agreeing to basic standards) (http://dsbb.imf.org/Applications/web/dsbbhome/). The following IMF table gives an indication of the dimensions of the standards:

The Four Dimensions of the GDDS

1. **The Data-Coverage, Periodicity, and Timeliness:** Dissemination of reliable, comprehensive, and timely economic, financial, and socio-demographic data is essential to the transparency of macroeconomic performance and policy. The GDDS therefore recommends dissemination of data as described in Table 1.
2. **Quality:** Data quality must have a high priority. Data users must be provided with information to assess quality and quality improvements. The GDDS recommends:
    - Dissemination of documentation on methodology and sources used in preparing statistics.
    - Dissemination of component detail, reconciliations with related data, and statistical frameworks that support statistical cross-checks and provide assurance of reasonableness.
3. **Integrity:** To fulfill the purpose of providing the public with information, official statistics must have the confidence of their users. In turn, confidence in the statistics ultimately becomes a matter of confidence in the objectivity and professionalism of the agency producing the statistics. Transparency of practices and procedures are key factors in creating this confidence. The GDDS therefore recommends:
    - Dissemination of the terms and conditions under which official statistics are produced, including those relating to the confidentiality of individually identifiable information.
    - Identification of internal government access to data before release.
    - Identification of ministerial commentary on the occasion of statistical releases.
    - Provision of information about revisions and advance notice of major changes in methodology.
4. **Access by the public:** Dissemination of official statistics is an essential feature of statistics as a public good. Ready and similar access by the public are principal requirements. The GDDS recommends:
    - Dissemination of advance release calendars.
    - Simultaneous release to all interested parties.

Source: IMF, Guide to the General Data Dissemination System.
http://dsbb.imf.org/vgn/images/pdfs/gddsguide.pdf accessed 18 October 2006

2.3.3 Cross-national standards

Common framework
In making cross-national comparisons it is obviously important that a data series from one country should be measuring the same characteristics as the same series from another country. However since data from each country originates from that country's own statistical department there is a danger that this won't be the case. To minimise this danger, IGOs (intergovernmental organisations) have for a number of years sought to develop common frameworks for definitions, locations, time periods, methodologies and accounting principles for a vast range of data series.

National Accounts
The **United Nations Statistical Commission** created and now oversees the implementation, publication and revision of a common framework for national accounts. It does so in collaboration with four other IGOs Euro-Stat, IMF, OECD and World Bank under the auspices of the **Inter-Secretariat Working Group on National Accounts (ISWGNA)**. This group convenes and takes advice from expert working parties on various issues and publishes **SNA News and Notes**. Recommendations on these matters are made to the UN Statistical Commission whose views are given international legal force through endorsement by the UN.

The framework for national accounts created by the UN is often referred to as the **1993 United Nations System of National Accounts** or 1993 SNA, or as 1993 SNA. At present (2006) the system is being revised. Occasionally the pre- 1993 framework is used, referred to by its year of origin, 1968, e.g. 1968 SNA.

Euro-stat has produced its own version of SNA(93), often referred to as the **European System of Accounts - ESA 95**, to gain even more precise commonality across European national accounts. The previous European framework is referred to as ESA 79. In general ESA 95 data series are compatible with 1993 SNA series.

Try to compare national accounting data series using common versions

Disaggregated and Non Economic Data

More disaggregated economic data, social, health and education data is produced by the statistical departments of all countries. To make cross country comparisons using this data requires a common classification framework. This is provided by the UN Statistical Commission or, for their own specialised fields, the World Customs Organisation (WCO), World Health Organisation (WHO), IMF and International Labour Organisation (ILO). The UNSC provide a good explanation of **basic principles**.

ISIC data

Many ESDS International macro-databanks series are based on the ISIC (International Standard of Industrial Classification of All Economic Activities) classification. This characterises all economic activity into groups and levels based on type of activity. For example at the highest level, it uses the category 'Manufacturing', but disaggregates to sub-classes such as 'Manufacture of electric motors, generators and transformers' and sometimes to even finer levels.

ESDS International provides a **users guide** to this. The UN Statistics Division provides more details of ISIC classifications including **ISIC Revision 3** and **ISIC Revision .3.1.** This year, a new revision of ISIC has now been approved by the UNSC, **ISIC Revision .4**. However it is too early for this to be in general use.

Most series for most countries will be ISIC revision 3 or .3.1, but some data series classified under earlier revisions are still current.

If at all possible compare series using the same classification scheme and same revision for each.

ISIC is a classification aimed to cover all economic activity, not just industrial activity

Other similar classifications schemes exist for particular purposes.

Energy and Related Data

ESDS international data-banks contain series on energy, oil and related matters produced by the Energy Statistics Division of the **International Energy Authority (IEA)** (see **ESDS International Dataset User Guide: International Energy Databases**).

The IEA which, originated from OECD and Euro-stat, compiles energy statistics from questionnaires, completed by national statistics offices. It thus seeks spatially harmonised statistics.

> Data is collected using a common reporting method for OECD countries thus harmonising the series but data from non-OECD countries is not always strictly comparable.

The IEA's definitions and methodologies are obtainable from ESDS International databanks as 'Documents'.

For example select 'IEA data' from the ESDS International home page then click 'World Energy Statistics'. The report screen looks as below:

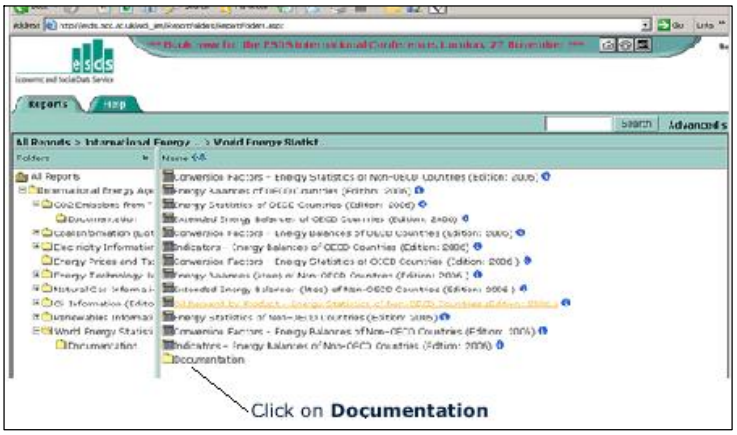

Figure 1: Beyond 20/20 screenshot

Most IEA "Beyond 20/20" pages will have such a sub-folder tab. The documentation, amongst other things will have sections on scope and methodology and comparability.

Health and Social Data
The World Bank is seeking to harmonise many non-economic data series. For details to check comparability see notes attached to World Bank series on the ESDS International 'Report page' or 'Beyond 20/20 data tables' and look at '**Definitions' of 'Population and Demographic Indicators**' and '**Education Health and Poverty Indicators**' on the **World Bank Data and Statistics** overview.

Activity 2 : Quiz

Answer the following questions to test yourself on what you have learnt so far

1. Who oversees the production of a common framework for national accounts?
2. What initials identify the current commonly used national accounts frameworks?
3. How many and which ISIC 'Revisions' are you likely find in databases?
4. From which IGOs did the International Energy Authority emerge?

Answers are available at the back of this study guide.

2.3.4 Metadata

Most data for series in the ESDS macro-databanks is produced by national statistical offices under the standards set by the UN and other IGO's (see earlier section). But it is not always reasonable for countries to work to the same standard; less rich economies may not wish to use as many resources as rich countries to produce statistics. So a common standard and hence complete comparability is not yet possible. Furthermore, there is often more than one reasonable definition for a data series, and more than one methodology for calculating it. So ESDS International series for different countries are not necessarily exactly comparable. The OECD, Eurostat and World Bank have produced guidelines for comparability. They also manage programmes to produce comparable series (see later section). Nonetheless

in making cross national comparisons, it is often important to check definitions and methodologies

Information on data series, including accounting conventions, classifications, definitions, descriptions, and methodologies is often called metadata. Included are characteristics such as periodicity (annual, quarterly monthly etc.), geographical area or political state for which the data has been collected, timing of measurement (e,g, whether a 'stock' series is valued at start, middle or end of accounting period), base years, units etc.. Details of series breaks (for example following a refinement of definition) and any recalculations of past data based on the post-break conventions are part of metadata.

And information required by quality protocols, including contact, publisher, publication dates, original source, code number etc. is also metadata

Much metadata is obtainable from ESDS International tables and reports.

Data series from different countries with similar or identical names and labels may not be measuring quite the same characteristics if the data has not explicitly prepared by an IGO for comparison.

It may be worth looking at the metadata to check comparability between series with the same name but from for different countries

2.3.5 How to obtain information on metadata and standards

Obtaining information about databanks and standards is often important in making cross national comparisons. Such information is obtainable at several levels through ESDS International macro data-banks.

Data series obtained from ESDS International contain some metadata with tables and reports that often give an immediate check on comparability.

Activity 3 : Metadata and information about data standards from ESDS International

You will need to go online to complete this activity – printed step by step

instructions can found in the back of this workbook. In this activity you will use Beyond 20/20 to obtain information about metadata and information about data standards from ESDS International resources.You will need your Athens username and password to complete this task.

More metadata can be obtained from the ESDS user guides. These in turn make reference to basic documentation obtainable online from the IGOs' own web-sites.

Activity 4: Finding the Data-set Description and Users Guide for ESDS International resources.

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will locate further information about the United Nations Common Database. You will need your Athens username and password to complete this task.

Activity 5: Finding further documentation on the UN Common Database metadata

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will locate detailed documentation about the United Nations Common Database. You will need your Athens username and password to complete this task.

The IMF run a program to make direct cross national comparisons of metadata - see next section.

2.3.6 Cross national comparisons of metadata

The IMF runs a web-based database of international social and economic metadata (information about data-series) which can be easily queried. It can be linked to different levels, from less detailed to more detailed metadata. It covers countries committed to the IMF's more rigorous Special Data Dissemination Standard (protocol for the production and publication of statistics) and many social, economic and demographic data-sets. It can give on-screen comparisons between counties of metadata for specified data headings.

2.3.7 International Comparison Programme

Making series cross nationally comparable

A number of IGO's have been working on producing data-series for countries and regions across the World that are based on identical metadata. Different types of statistic have different problems of comparability, but some of the common sources of difference between series with common titles or headings are:

- locations
- measurement dates
- splicing methods
- in scope of series
- base years and locations
- methodologies
- presentational formats
- in treatment of missing or estimated data

...and many other differences, many of which might seem small but could have a large impact for any particular cross-national study or report.

It is also the case that much data is inherently unsuitable for comparison and new series need to be produced to make comparison possible. See following sections to explore some of these matters.

Who is trying to improve comparability of series?

The United Nations has sought to encourage (and itself produce) comparable series for economic, social and environmental data.

As the European Union and its predecessors have developed, Eurostat has been faced, as an immediate practical problem, with harmonising many data series between countries and has been a leading force in producing common metadata to harmonise data series.

The OECD has also been a leading force in producing common-based cross- national data series, as has its energy offshoot, the IEA. The World Bank has been harmonising many social data series.

Using series from a single ESDS International data-bank reduces the chance of making invalid comparisons between countries. Eurostat and OECD data banks are particularly useful in this respect as far as economic data is concerned.

International Comparison Programme

Perhaps the best known project to obtain international comparability has been the **International Comparison Programme (ICP)**, managed by the World Bank. This seeks to provide directly comparable macro-economic data-series on a country by country and region by region basis. Series for OECD and European countries are in fact produced by the OECD and Eurostat and are broadly consistent with series produced for all other countries by the World Bank.

Much of this work is based on the concept of Purchasing Power Parity. Look for the letters PPP in the headings or titles of data series.

2.4 Using money as a measure to make cross national comparisons

This section summarises the advantages and disadvantages of using money measures of economic and social activity to make cross national comparisons at the monetary level.

It discusses market exchange rates both from the perspective of converting series into a common base currency and as comparative data themselves. It considers the use of exchange rates to create indexes such as weighted exchange rates and purchasing power parity rates that can be used as more accurate bases for comparison of money data across different locations. It indicates where exchange rate data can be found in ESDS International macro databanks.

2.4.1 Money as a common measurement base

Many series on the ESDS International Macro data bases are directly about the economy or are about costs, expenditures, economic welfare, work, abliving standards, benefits etc...

Whilst ultimately the things measured by the series are about matters important to people, will we get enough to eat, will we get a job, can our illness be cured, can we enjoy a new TV set, is our house safe from flooding etc. the very diversity of these matters seems to make them incomparable.

To make comparisons there has to be a common standard, and money can be used as this. It can be thought of as a common accounting device.

> Country A has less poverty than country B because there are fewer people in country A earning less than a dollar a day than in country B. This might be a valid statement but it does depend on the money criterion 'dollar a day'.
>
> This economic policy is better than that because it has lead to a faster growth rate in national output - measured in money terms.

Not all measures of benefit or cost to human beings are measured in money terms. Scientists tell us that emissions of carbon dioxide are damaging the ecosphere and

causing global warming. We can measure such a cost in terms of physical measures (e.g. tons) of carbon released into the atmosphere.

Aspects of human welfare might be well measured by the amount of education the young receive, or average life span.

However at the moment even specific non-money measures are difficult to compare as measurement definitions and methodologies are different between countries and organisations. Anyway all these particular measures don't 'add up' to a single comparable figure. So money measures remain crucially important.

But there are problems: an obvious difficulty in making cross national comparisons using money is that different countries often have different currencies so money is not a simple common unit of account between countries. This will be looked at in later sections.

There are also deeper problems about the use of money as a standard of comparison that we shall look at briefly in the next section.

2.4.2 Limitations of money as a common base for cross national comparisons

Intangibles

In measuring human welfare there are some things that money doesn't measure directly. The vision of a sunset, the exuberance of playing a sport, the delight of watching your children grow up are some positive examples; some negative ones being the death of a family member, separation from your life partner, despoilation of much loved countryside.

Aspects of these can be captured by a money measure, but not their total effect. Economists sometimes seek to value aspects of intangibles by asking 'how much would you be prepared to pay to keep the positive or avoid the negative'. Such valuation methods are reflected in some series, but are problematic. From the viewpoint of cross national comparisons the problem is great - just how do statisticians from different countries deal with such intangible matters?

Tangibles

Even on tangible matters, there are problems for instance - what is included in any measure? In the following research activity you are required to find out answers to the following questions before comparing your answers to ours.

Activity 6: Quiz

1. Does gross national product include the output of self sufficient farmers producing for themselves and their neighbours?
2. Is the allowance based on common inter-country definitions and measure?
3. Is housework included in a money measure of economic activity?
4. Are voluntary activities measured on a money base â€" where do we count the effort made by a volunteer school governor?
5. Are activities regarded as 'outside' of official markets (informal) or immoral or criminal included in money measures?

The answers are available at the end of this study guide.

Statisticians and economists sometimes deal with such problems by estimating the activities and their money value by association with other more immediately measurable variables or by hedonic methods.

Nevertheless, money is still used as the most frequently occurring standard of account.

2.5 Using exchange rates to make cross national comparisons

This section looks at the mechanism whereby data denominated in money terms but different currencies can be transformed to a common currency.

It discusses market exchange rates both from the perspective of converting series into a common base currency and as comparative data themselves. It considers the use of exchange rates to create indexes such as weighted exchange rates and purchasing power parity rates that can be used as more accurate bases for comparison of money data across different locations. It indicates where exchange rate data can be found in ESDS International macro databanks.

2.5.1 Market Exchange Rates

There are a number of different published exchange rates and each has its own significance. Where currencies are fully convertible, foreign exchange markets determine their value. Rates determined by foreign exchange markets are frequently termed market exchange rates. ESDS International databanks contain series of market exchange rates; the IMF database being the most important of these

Market rates as cross national comparators

Since the foreign currency is bought and sold using the 'home' or 'local' currency, the exchange rate is the price of that home currency. The rate can be expressed as units of foreign currency for a unit of home currency or units of home currency per unit of foreign currency

e.g. 1.50 Euro per pound sterling or 66.66 pence per Euro.

In this sense, a currency's market exchange rate is always comparative information.

Published market rates are bi-lateral, between two countries, as in the example above. (See following sections for rates relating more than two countries)

The rate indicates the value of traded goods that can bought with a unit of home currency from the other country. It also indicates how currency dealers and their clients rate the two countries. A country judged to be thriving compared to another will tend to attract dealers to its currency hence the rate will rise and vice versa.

Most markets will have forward and other derivative markets in currency, which will differ from spot markets according to the expectations of participants. ESDS publishes some forward rates in the IMF databank.

Using market rates as cross national comparators

Comparing exchange rates at one point in time has little meaning. The fact that a dollar is worth less than a pound sterling certainly does not reflect anything about the economies of the USA and UK. On the other hand changes in exchange rate are comparable. A rising pound and falling dollar means that the UK are able to buy more goods from the USA than previously; a clear improvement in welfare for the UK.

Exchange rates are not cardinal. You cannot compare values at any one point in time.

You can compare time trends in exchange rates (see later section on indices)

Denomination and time base

Exchange rates are generated continuously on World currency markets. IMF data published through ESDS International gives a number of exchange rates denominated in dollars and SDRs (Special Drawing Rights). There are a number of series, two being based on different time measures, average rate per period, end of period rate.

Compare exchange rates changes using the same currency base and same time period base for each country. Changes in rate differ depending on which is used.

Alternative exchange rates for use in comparisons

However there will be many factors influencing a market rate, including the subjective views of dealers as suggested above. Inflation and anticipated inflation, past and possible future productivity, macro and monetary economic policy, political policy and stability, particular very high value international transactions and many other factors determine market rates.

Trade between the two countries may be a very small factor in the international trade of each, making the bilateral rate insignificant as a means of comparison of well-being or competitiveness.

Some countries economies will be more open to trade than others, other countries will be more self-contained and terms of international trade may not affect their welfare much, nor be a good measure of how that country is changing compared to others.

ESDS International publish many 'non-market' exchange rates produced by IGOs and national statistical agencies that ameliorate the above effects and often enable better cross-national comparisons using exchange rates to be made. (See following sections)

Managed and pegged exchange rates

Governments often operate in foreign exchange markets or pursue economic policy to attempt to change rates to meet their own objectives. Indeed, from time to time, most governments will try to manage their exchange rates. Frequently a government will 'peg' its rate to another currency, such as the dollar, by operating in the foreign exchange market. Pegged rates reveal more about a country's macro-economic policies than its economic characteristics compared to other countries.

If using market exchange rates for comparison, check each country's exchange rate policy to see if published rates reflect market valuations or macro-economic policy.

Legally determined exchange rates

A number of countries set their exchange rate by legal means. These exchange rates are called official rates. (See following section).

It can be very misleading to make comparisons between official and market exchange rates

You might want to look at secondary or tertiary rates for such a country. These can often be found in the ESDS International databanks

Non-dollar bilateral exchange rates

Often research requires market rates denominated between currencies not used as a base for published rates. For example you may wish to use the rate of exchange between the Mexican Peso and the Danish Krone.

The dollar exchange rates published in the ESDS International IMF databank are transitive. Bilateral rates between two countries not involving the dollar can thus be calculated using the dollar rates of the two countries.

2.5.2 Official Exchange Rates

Some countries, especially those who legally limit transactions in foreign currencies, have fixed their rates through legislation or a legislative body (perhaps a currency board or central bank). This rate is compulsory for transaction of certain types.

Such rates are useful for many purposes, but might reveal more about a country's macro-economic and political policies than its economic activity.

In such economies there will often be an unofficial rate determined by actual currency transactions.

Sometimes there are two or more rates. A main rate is often published as a 'principle' rate. Sometimes there will be secondary or tertiary exchange rates used for different purposes (for example tourist expenditure, direct investment from

outside the country). For example Cuba has two currencies, one for external dealings and the other for internal use. The 'convertible peso' is fixed to the dollar and the 'national peso' has an exchange rate to the 'convertible peso' set by the Cuban authorities.

In such cases interpretation of exchange rates for purposes of comparison need to take this into account.

Some countries maintain official exchange rates but allow them to change as market conditions change, e.g. Russian Federation.

Whilst at the moment it is very difficult for a country to determine its exchange rate purely by command, over the time period covered in the ESDS International macro-databanks this has not always been the case. Many currencies have been subject to a number of different national exchange rate regimes - from state controlled official rates, through to 'floating' rates mainly determined by the foreign exchange market.

Check the nature of the exchange rates under comparison for the countries and time period being used, especially if the series include official rates.

2.5.3 Dollar and other bilateral rates

Exchange rate denomination

ESDS International macro-databank exchange rates are often denominated in dollars,

either

Local currency per US dollar (for the local currency this is the **direct** rate)

or

US dollars per unit of local currency (for the local currency this is the **indirect** rate)

e.g. £0.60 per US dollar **or** $1.666 per £ sterling

Calculating bilateral exchange rates

Often an exchange rate between two non US dollar currencies will be required. This can be calculated from the pair of dollar exchange rates. For example to find the exchange rate between the UK pound and the Thai baht we **multiply** *direct pound-*

dollar rate **by** *indirect baht-dollar rate* **to get** *direct pound-baht rate*

At 1991 exchange rates				
direct pound-dollar rate		indirect baht-dollar rate		direct pound-baht rate
£/$	x	$/B	=	£/B
0.5	x	0.0395	=	0.01975

(Exchange rate sources, UN, UN Common Database, 26 April 2006 and IMF, IFS, Nov 2006 both at ESDS International, (MIMAS) University of Manchester)

That is to say

it would cost £0.01975 (1.975 pence) to buy 1 baht

or

£1 would buy 50.63 baht

To find the exchange rate of a currency with respect to another currency, multiply the direct dollar rate of the first currency by the indirect dollar rate of the other currency

Interpreting bilateral exchange rates

Authorities managing currencies will do so in many ways (see previous sections). The comparative information contained in a bilateral exchange rate needs to be interpreted with care as it may reflect factors not required in a comparison.

For example, it is not uncommon for a currency exchange rate to be pegged to the dollar. As the dollar exchange rates rises or falls in relation to other currencies, the pegged currency will similarly rise or fall in relation to those currencies. Changes in the pegged currency value will reflect changes in the dollar market, not changes in its own country's economy.

Some countries peg their rate to the Euro and others to mixtures of rates weighted by trade value. The same point as above applies.

Published changes in bilateral exchange rates will not reflect underlying comparative economic changes if one of the currencies is fixed or pegged to the dollar or Euro or other currency/bundle of currencies.

Fixing or pegging a local currency to another (usually international reserve) currency does not stop the local currency changing in value to other currencies in the World. It will so change as its base currency changes.

Activity 7: Dollar and Bilateral Exchange Rates

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. This activity involves downloading and visualising exchange rate data from the **United Nations Common Database**. You will need your Athens username and password to complete this task.

2.5.4 Nominal and real effective exchange rates

Note that much IMF data specifies exchange rates with respect to the US dollar and its own 'reserve claims' - Special Drawing Rights or SDRs.

SDRs

The IMF has issued a number of claims called Special Drawing Rights to member countries which entitle them to purchase other currencies for use in protecting their own currency. The 'rates' at which SDRs can be converted to other currencies are the SDR exchange rates. These are calculated on the basis of a weighted average of the dollar exchange rates of the four key World currencies (dollar, euro, yen, pound sterling) taken daily at noon in the London currency market. The weighting is based on the relative use of each of these 4 currencies in international transactions. It is determined by the IMF every 5 years.

The rate for a particular currency can be calculated using its dollar exchange rate. For each other currency, the rate is a very rough average of the rate they can trade at across these key currencies. However, whilst the SDR rate is important for IMF dealings, including the calculation of interest rates on IMF loans, it is seldom used in

market transactions or as a basis for national exchange rate policy. Most importantly, since the weighting given to each key currency is not likely to match the trading patterns of any particular country, it is of little value in making international comparisons.

Effective Exchange Rates.

Market exchange rates are bilateral - comparing the value of two currencies against each other. However, much comparative research seeks to compare the general trading situations of a number of countries.

Indeed any particular country may be more interested in how its exchange rate is behaving in relation to all its trading partners rather than to any single one of them. Commonly this is measured by a country's trade weighted exchange rate.

Nominal Effective Exchange Rate

In simplest index form, the trade weighted exchange rate can be found as a set of Nominal Effective Exchange Rates (NEER) in several databanks in the ESDS International macro-data collection. A country's NEER is a weighted average of its currency exchange rates with its major trading partners' currencies. The weightings will be based on the level of trade with each trading partner. Thus a NEER gives a much better view of changes in a country's terms of trade with the rest of the World than bilateral or SDR rates.

Consequently, series for NEER can be used to compare changes in the terms of trade of a number of countries.

A country whose NEER is falling, is trading internationally on worsening terms; it is costing that country more to buy goods and services from abroad.

Real Effective Exchange Rate

An important refinement of the NEER is the Real Effective Exchange Rate (REER). This is particularly useful in considering comparative changes in a country's real economic circumstances. If the spot market rate for a country or its NEER shows a downward trend this could be because other countries are becoming relatively more productive. But it could arise from a difference in inflation rates between that country and others in the World. The REER is a NEER with price or labour cost inflation

removed. It is thus a better measure of comparative economic activity between countries than simple market rates.

Comparing the real effective exchange rates of a number of countries will show which have gained and which have lost some of their international competitiveness.

Comparability of Effective Exchange Rates

Comparing two effective rates at one point in time gives no useful information. The initial values of exchange rates are arbitrary. They depend on the unit of currency chosen. Suppose the dollar/ sterling exchange rate were $1.5 per £ sterling. Suppose the Euro dollar exchange rate was $1.2 per Euro. This doesn't mean that Sterling holders are better off than Euro holders. Suppose that the sterling/dollar rate was to be denominated in Sterling pence and US dollars. The dollar/sterling exchange rate would now be $0.015 per penny. Only denominated units would have changed giving a lower number to the sterling exchange rate compared to the euro rate, but of course sterling holders are neither richer nor poorer than Euro holders as a result!

Effective exchange rates are not CARDINALLY comparable. Money values of effective exchange rates cannot usefully be compared.

Effective exchange rate time trends can however be compared using indices (see later section)

2.5.5. Atlas exchange rates

The World Bank publishes 'Atlas' conversion rates. These are three year averages of market exchange rates adjusted for relative inflation. As such they show trends in market rates, short term fluctuation in rate (very common in market exchange rates) being smoothed out. $US dollar rates are commonly used.

Inflation is removed from the series by adjusting each rate with its inflation relative to the rest of the World (as measured by SDR exchange rates).

Series adjusted by Atlas rates can show truer data than those adjusted by straightforward market exchange rates but, especially for poor countries, series will be very different from PPP adjusted data (see next section). PPP adjustment is considered to give a better reflection of price level changes for many purposes.

Atlas rates are used by the World Bank for a number of purposes, including setting the terms of lending. The Bank uses PPP conversion rates for much of its analytical work.

2.5.6 Purchasing Power Parity Exchange Rates

Whilst the most exchange rates, in and of themselves, make certain kinds of cross national comparison, they are obviously limited in scope. Nonetheless if any monetary values are to be used in making cross national comparisons, different local currency units need to be converted to a common monetary base. Purchasing power parity (PPP) exchange rates are published to do this. Conceptually such a rate is a combination of price index and exchange rate. The OECD provides a good **PPP explanation**.

PPP exchange rates are often referred to as 'conversion' rates

Internationally traded and non traded goods

It is frequently observed that, from the viewpoint of a foreigner, goods in a country visited are either much more expensive or much cheaper than at home, measured in terms of their own currency converted to the foreign currency at market exchange rates. This is because foreign currency is basically required to trade goods and services (consumption or investment goods) or to participate in financial dealings in another country. However these transactions represent only a part of those undertaken in the foreign country. Many goods and services are not traded cross nationally. A common example of such a service is a haircut. Prices and conditions of these non-internationally-traded goods therefore do not influence foreign exchange markets. Yet for the inhabitants and visitors to a country they can be a very important part of their expenditure. The cost of buying goods in a country with

comparatively cheap non-internationally-traded goods will be less than buying similar goods where they are high priced.

Purchasing Power Parity exchange rates

In other words a fixed amount of home currency will buy different quantities of similar goods in other countries if non-internationally-tradables have different prices. Purchasing Power Parity exchange rates allow for this difference. Conceptually they are calculated as the ratio of the cost of buying a standard, or highly comparable, bundle of goods in different countries using the indigenous currency in each. A purchasing power parity exchange rate between two countries would mean that the standard bundle of goods would cost the same in each of the two countries. A euro would buy the same number and quantity of haircuts, meals, video games etc. in Europe as it would if exchanged for rupees and used to buy those goods in India.

Purchasing Power Parity exchange rates are not prices that emerge from markets. They are international price indexes calculated by national income statisticians.

PPP exchange rates can be found on ESDS International OECD databanks for OECD countries and World Bank databanks for other countries.

Who is responsible for PPP exchange rates?

In OECD and EC countries PPP rates are the responsibility of the Joint OECD-Eurostat PPP Programme. The International Comparison Programme managed by the World Bank is responsible for PPP rates in countries not covered by the OECD-Eurostat programme.

How PPP rates are calculated

A mixture of goods and services (within 'headings'), both internationally traded and non-traded is determined. It must contain goods comparable between all countries to be covered by the PPP rate.

National statisticians calculate the prices of each good or service in local currency units and in an international base currency (denominated as US dollars). For each good, their ratio gives an exchange rate between the local currency and the international base currency that would equalise the price of that good whether denominated in the local or base currency.

This is not an actual market price or exchange rate and should not be regarded as such.

These disaggregated exchange rates are then combined with sets of weights to give rates applicable to more general headings and the economy as a whole, i.e. up to the highest level statistics such GDP and GNI (see later sections). The rates at this level are the PPP exchange rates for that economy. The World Bank publishes a good summary of how PPP rates are calculated.

The main method used to compute PPP exchange rates is a version of the 'EKS' system. See the UN Handbook of the International Comparison Programme for more detail. This enables PPP exchange rates to be transitive; all binary rates (rates between any two countries) are consistent with each other.

This means that although PPP rates are denominated in US dollars, the choice of base country is not important. A PPP rate between any two countries could be calculated from the 'dollar' rate for each country.

The use of PPP rates

PPP exchange rates can be thought of as 'spatial' price indexes. They are crucial in making cross -national comparisons of 'real' levels of economic and related activity. Many series published through ESDS International databanks are deflated by a PPP exchange rate to show the 'volume' measure; actual production or consumption etc. allowing for the fact that different economies have different price levels.

Cross national comparisons requiring measures of 'real' activity should normally be made using PPP exchange rates as price deflators.

Series deflated by PPP exchange rates normally have 'PPP' or 'International Prices' or 'International US dollars' or 'PPS' in their title or description.

PPP exchange rates are designed as spatial or locational indexes, suitable for cross-national comparison. Their use in making comparisons **over time** has limitations and statisticians advise care in their use (see later sections)

Base years and updating

PPP rates can be 'current' or 'constant'.

PPP rates are 'benchmarked' (i.e. based on a new survey of prices) every year in European OECD countries, every 3 years for non-European OECD countries and every 5 years for ICP countries.

Current PPP rates are those that use the latest benchmark information.

Current rates should be used for cross national comparisons in any single period, as they contain the most up to date information

Because the benchmark information changes from period to period, any changes measured are not simply price level changes. Comparison over time is therefore complex

Constant PPP rates are based on PPP rates in a specified year, updated by a consumer price index.

Constant PPP rates are based on PPP rates in a specified year, updated by a consumer price index.

Constant rates should be used for **comparison over time** as their base does not vary over time - they are comparing like with like.

Constant rates are **NOT** however invariant to the base year chosen

2.6 Using national accounts data to make cross national comparisons

This section suggests where to find data series that have used harmonised metadata and methodologies in order to produce maximum comparability between countries.

It emphasises the need to use the most appropriate variables, implied by the purpose of the research, in making a cross national comparisons.

It considers the use of purchasing power parity based data series for making accurate cross national comparisons.

It looks at the problem of making cross national comparisons over time and the use of indices.

2.6.1 Use series designed for comparability

As suggested previously, standardisation is achieved in national accounts series by compliance with 1993 SNA or ESA 1995. Comparisons are best made within the convention, though ESA 1995 is compatible with 1993 SNA.

Some series in ESDS International follow different, perhaps earlier conventions (e.g. 1968 SNA). Check for this as problems may well arise in making comparisons with series produced under the current conventions (as above).

In most ESDS International macro-databanks, disaggregated data for economic activity by industry is obtained using ISIC Rev.3 or its European counterpart NACE Rev.1 (that operates with the same classification system as ISIC but with greater precision).

But ISIC Revision 2 series are to be found in the databank. Check for comparability with Revision 3

Some series useful for making comparisons

OECD is at the forefront in producing harmonised data. Its STAN database recommends itself for use in making comparisons in many areas including

disaggregated data based on ISIC. STAN also contains harmonised Input-Output tables.

Aggregated national account series in PPP (see later section) format are published in the ESDS International databank in the World Bank "World Development Indicators" and in the OECD "National Accounts Comparative Tables Based on exchange Rates and PPPs" (and other tables) databank

Social expenditure for OECD countries, at purchasing power parity (PPP), can be found on the Social Expenditure Database on the OECD data-bank on ESDS International macro-databank site.

Use OECD and World Bank databanks to find well harmonised series. Eurostat and UN Common Databanks also contain harmonised series.

2.6.2 Choosing the correct series for your comparison

Exemplar: Size of economy, productivity and welfare

In comparing the sizes of economies, the purpose of the study has to be considered. Comparing absolute sizes (the value of goods and services produced by each country in total) might be important to your research. In which case GDP or GNI would be proper series to use.

But you might want a relative measure, such as how much each member of the population was producing, or receiving. In such cases you might use GDP per head or per capita - commonly available.

Productivity

GDP per capita would give a rough measure of how much each member of a population was producing - labour productivity.

But data in 'per head' or 'per capita' terms obviously depend on the measure used in calculating the size of population - for example whether it was people actually employed, people of working age or the whole population. The first two of these would obviously depend on measures of demographic and economic structure and the unemployment rate; each variously defined. The latter would depend on how the total population was defined.

Comparing labour productivity might be better achieved through a measure of output per hour. Rate of growth of output per hour is commonly used. OECD and ILO produce such data which is available on ESDS International.

Activity 8: Comparison of "GDP per employee" with "GDP per hour worked" for France, UK, US, Germany, Japan

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will use the "ILO KILM" database to produce "GDP per employee" and "GDP per hour" series for the above countries for 1980-2004. You will need your Athens username and password to complete this task.

Activity 9: GDP per head v GDP per employee in Australia

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will use the "ILO KILM" database to produce a "labour productivity for total economy" series for Australia. You will need your Athens username and password to complete this task.

Welfare

It might be tempting to use GDP per head to measure how well-off the population was individually. Again this could be used as a very rough measure for international comparison. Most of the inhabitants of a country whose GDP per capita was $1000 per year are likely to be worse-off than the inhabitants of a country whose GDP per capita is $20000 per year.

But often the measure is too bland. The DISTRIBUTION of resources might differ greatly from country to country. GDP per head is an AVERAGE figure. What people actually receive is distributed around that average and variation can be very great - in some countries income is very unequally distributed. Furthermore such distribution is seldom normal or even symmetrical. In virtually all countries a few people receive very high incomes but many receive very low incomes, giving a 'positive' skew.

2.6.3 Purchasing Power Parity Comparisons

Exemplar: Comparing the size of national economies

The absolute size of economy is often measured as GDP or GNI. Every country in the World publishes such a figure for its own economy. We have looked at the general problem of comparability between different countries' national accounts and how it is being solved. But there is still an obvious conceptual problem.

Published GDP or GNI is originally produced in the currency unit of its own country (its Local Currency Unit or LCU). So to make cross national comparisons, each local figure has to be converted to a common standard. Exchange rates are the most obvious way to do this.

As we have seen there are many kinds of exchange rate. Most market or official exchange rates do not adequately reflect relative price levels between countries, and economic aggregates. So even the basic size of an economy - how much economic activity is going on, how many goods and services are being produced and sold becomes ambiguous!

This means that many other phenomena such as productivity, welfare, distribution of income and wealth, extent of poverty, efficient use of energy, carbon dioxide emissions etc. that require directly, or as a ratio, some form of measure of economic size or economic growth are not so easily measured Purchasing Power Parity (PPP) rates can however be used, at least to make cross national comparisons.

Purchasing Power Parity estimates of GDP and GNI, their component parts and indeed value added by products and product groups are available on a number of

databanks directly accessible through ESDS International. The common 'currency' to which GDP or GNI data has been converted is often referred to as 'international' US dollars.

Activity 10: Using Purchasing Power Parity (PPP) series: Comparing the size of economies

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will create and compare 'league tables' based on **GDP (constant 2000 US$)** and **GDP PPP (constant international $)**. You will need your Athens username and password to complete this task.

Activity 11: GDP in China and UK

You will need to go online to complete this activity – printed step by step instructions can found at the back of this workbook. In this activity you will produce a report in table and chart form of GDP of China and UK measured in constant US $s and constant PPP international $s. You will need your Athens username and password to complete this task.

2.6.4 Making cross-national comparisons over time

A complication arises in making cross country comparisons if you also wish to extend the comparison over time. This is because conditions, for example price levels, relative prices, expenditures and mixture of goods bought or produced, changes. This problem is common and usually requires series that have been explicitly or implicitly deflated with a price index.

If you make a comparison between various countries' macro-economic series, such as gross national income, national expenditure, national saving, aggregate investment etc of, it is best to use PPP measures. (see previous sections). These will give you as much comparability as possible.

But series in ESDS International macro data-banks may be labelled **current** or **constant** prices

Current price series make best cross national comparisons at **any point in time**

This is because they use, as nearly as possible, the most up to date data on expenditures and bundles and quality of goods transacted in the economies under comparison. However for this very reason the bundle of goods on which the comparison is based changes periodically .So over time like is not being compared to like and current price comparisons fail to distinguish price change effects from real effects - the very point of PPP comparisons. Furthermore there are reasons to suspect that changes in the basic bundle of goods make comparisons between very different economies increasingly inaccurate.

Constant price series are better for making comparisons **over time**

This is because they are based on the same bundle of goods (the base year bundle) over the time-span used. Temporal price indices have been used. But if over the time-span expenditures and choices change (and economists believe that in general they will - the so called substitution effect), the common bundle of goods becomes less accurate so less able to reflect each individual or groups' welfare. This is a well known problem with series based on common base year indices.

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But, in addition, if cross national comparisons are being made between countries in which data-series trends diverge the price level comparisons becomes less accurate and the comparisons less valid.

Some series have little or no cardinal meaning in comparing economies e.g. REER. But they do enable comparisons of trends over time. See next section.

2.6.5. Comparisons using indices

Many ESDS International macro-data-bank series are in the form of indices; they are based on an arbitrary base value and show changes in the series as a proportion of the original base value.

For example: value added in the construction industry in Spain was 47584 million Euros in 2000 and 54901 million Euros in 2001. If we take 2000 as a base year and give it the value 100, in 2001 the index would be (54091/47584) x 100 = 115.4

So the index would read

Spain		
Year	2000	2001
Index	100	115.4

Such series can be a useful simplification and easy to present as graphs. Using a common base year, different countries can be compared.

Often VOLUME (e.g. of output) series are shown as indices, as they have been deflated by a price index and except for the base year do not show directly observable values anyway.

But most importantly, a number of series have no useful interpretation of absolute values anyway. The value of output between two countries is incomparable if measured in terms of each country's local currency unit. Yet their rate of growth (or decline) can be compared using indices.

For example, the value of South Korea's construction industry output was 42,926,700 million won in 2000 an 47,181,900 million won in 2001. In terms of absolute values, nothing no comparison can be made between Spain and S Korea - we have no conversion factor such as an exchange rate to compare the value of the won to the value of the Euro. But we could construct indices similar to the table above.

S.Korea		
Year	2000	2001
Index	100	109.9

We can easily compare such indices.

Many series in ESDS International macro-data-banks are given as indices. This is often convenient for comparison and producing graphs and charts

Some series have arbitrary base points and can only be shown as indices.

Activity 1 : Answers

1. What differentiates Intergovernmental Organisations (IGOs) from Non-governmental organisations (NGOs)?

   Answer: IGOs are established by agreement between states and have international legal status, often established by international treaty. NGOs are often established by interest groups and have little or no international legal status.

2. Which IGO plays the lead in setting standards for the quality and integrity of statistics and statistical services?

   Answer: United Nations Statistical Commission

3. Which organisations have databases published in the ESDS International macro-database?

   Answer:
   United Nations
   International Monetary Fund
   World Bank
   Organisation for Economic Cooperation and Development
   European Union
   International Labour Organisation
   International Energy Authority

Activity 2 : Answers

1. Who oversees the production of a common framework for national accounts?

   Answer: UN Statistical Commission, working with other IGOs in the Inter-Secretariat Working Group on National Accounts (ISWGNA).

2. What initials identify the current commonly used national accounts frameworks?

   Answer: Typically you will find: SNA 1993; SNA(93); and ESA 95.

3. How many and which ISIC 'Revisions' are you likely find in databases?

   Answer: ISIC Revision 3 and ISIC Revision 3.1 are the most common. Occasionally earlier revisions are still in use. ISIC Revision 4 will become increasingly common.

4. From which IGOs did the International Energy Authority emerge?

   Answer: Mainly from the OECD but also from Euro-stat, the EU statistical organisation.

Activity 3 : Metadata and information about data standards from ESDS International

1. On a data table, some data cells have numbers in brackets. Sweep the cursor over these cells and you will obtain a box containing metadata.

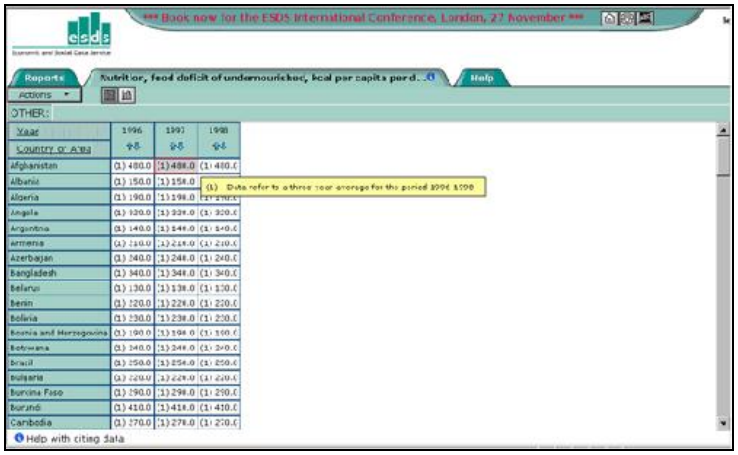


Figure 2 : Obtaining further information from Beyond 20/20 tables

2. On 'data tables' and 'item lists' and 'reports', the icon appears. Clicking this icon gives metadata.

Activity 4 : Finding the Data-set Description and Users Guide for UN common database

From the ESDS International 'About ESDS International' page, click the 'Data' tab or the 'Access data' link towards the bottom of the page. On the resulting page 'Introduction to finding and accessing data' click 'United Nations Common Database' (near bottom of the page Fig 3:).

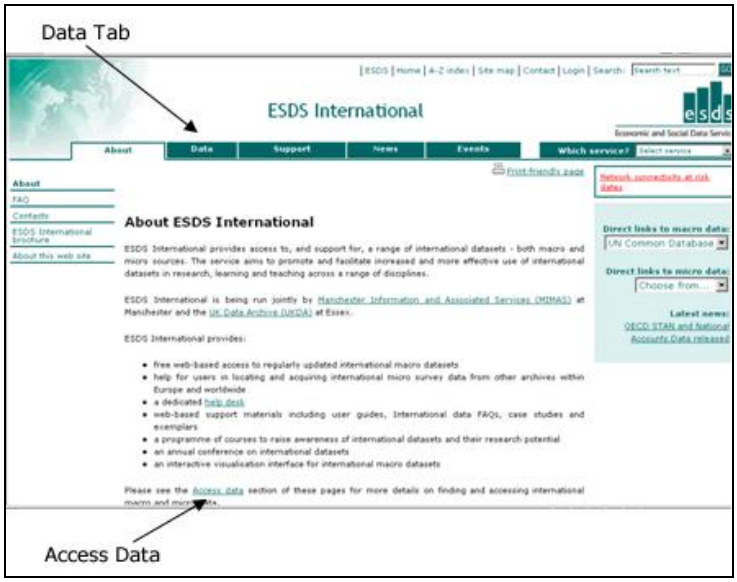


Figure 3: Finding the Data-set Description and Users Guide for UN common database 1

This gives you the short **dataset description**:

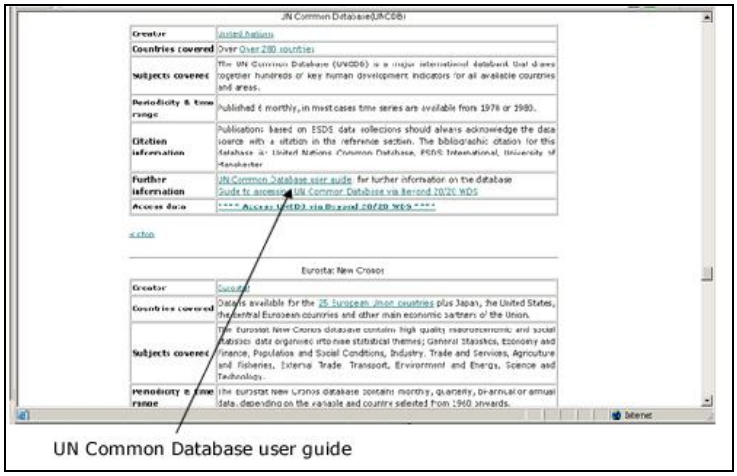


Figure 4: Finding the Data-set Description and Users Guide for UN common database 2

Now click 'UN Common Database user guide' (not the 'accessing' guide). This gives you the United Nations Common Database Users Guide.

Figure 5: United Nations Common Database Users Guide

The dataset users' guides can also be obtained from
http://esds.ac.uk/international/support/user_guides/
Or from clicking the 'support' tab on the 'About ESDS International' page

Activity 5 : Finding further documentation on the UN Common Database metadata

You can obtain further metadata for the UN Common Database User Guide by finding the 'documentation' section of the ESDS User Guide and clicking 'UN Series Notes' and 'UN Sources'.

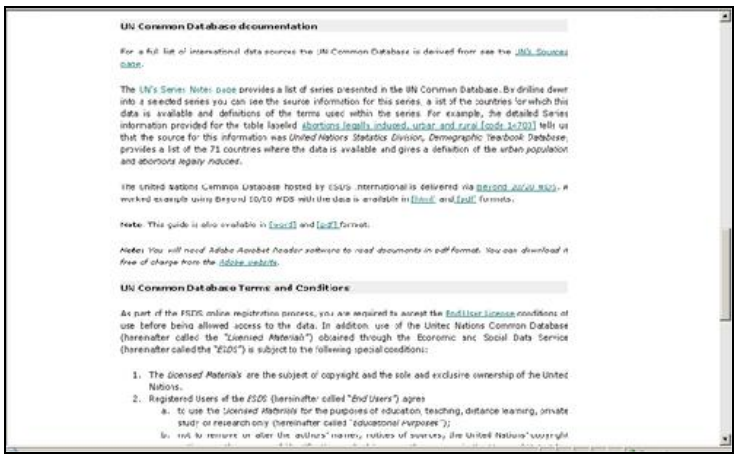


Figure 6: UN Common Database User Guide

'UN Series Notes' looks as follows:

Figure 7: UN Series Notes

Note that you can obtain more metadata from the links on the left of the page and details of the individual series from the main links.

In general, you can obtain original database documentation containing most metadata for each ESDS International macro database from links in the ESDS User Guide 'documentation' section.

Some databases enable you to see original documentation straight from the icon or from Report Folders.

Activity 6 : Answers

How do your answers compare with ours?

1. **Does gross national product include the output of self sufficient farmers producing for themselves and their neighbours?**

   Answer:
   Up to a point, some allowance is made for this in some National Accounts

2. **Is the allowance based on common inter-country definitions**

and measure?

Answer:
Not yet. This puts major uncertainties into comparisons between poorer countries that tend to have large self sufficient agricultural sectors and (often) richer countries that don't.

3. **Is housework included in a money measure of economic activity?**

   Answer:
   No, though there is much controversy and estimates have been made.

4. **Are voluntary activities measured on a money base where do we count the effort made by a volunteer school governor?**

   Answer:
   They are not included.

5. **Are activities regarded as 'outside' of official markets (informal) or immoral or criminal included in money measures?**

   Answer:
   Allowances are made for informal economic activity and some attempt is made to harmonise these across national accounts. However the extent to which some immoral, criminal or informal activities are included in money measures depend on declarations or estimates for tax purposes. It is obviously very difficult to harmonise standards or metadata in this area.

Activity 7 : Dollar and Bilateral Exchange Rates

From the ESDS International macro-databanks go to the **United Nations Common Database** and find 'Exchange rate, national currency per US$, end of period (IMF)' for the period **1988 to 2004** and find market and official exchange rates (whichever is given) for the following countries:

- China (Hong Kong)
- Euro Area
- Gabon
- Russian Federation
- Thailand
- United Kingdom

Task 1:

Produce an on-screen a table of the results and a line chart of Euro Area and Gabon exchange rates.

Task 1: Results

Your results should look something like this:

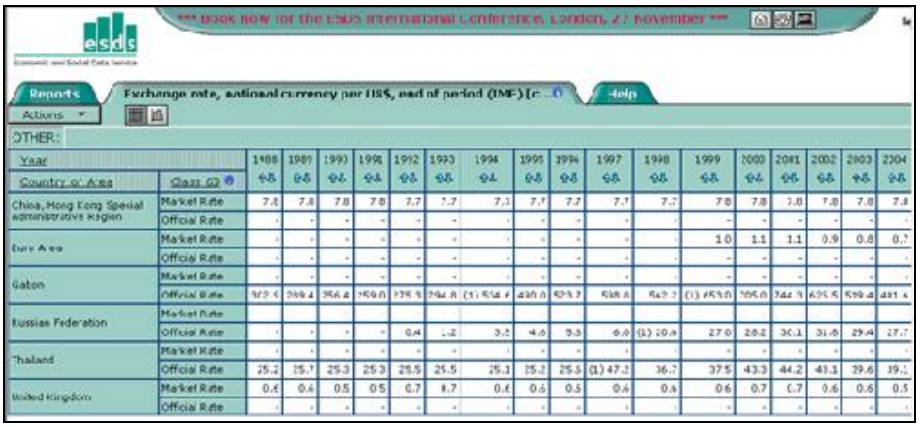


Figure 8: Table of the results for Euro Area and Gabon exchange rates

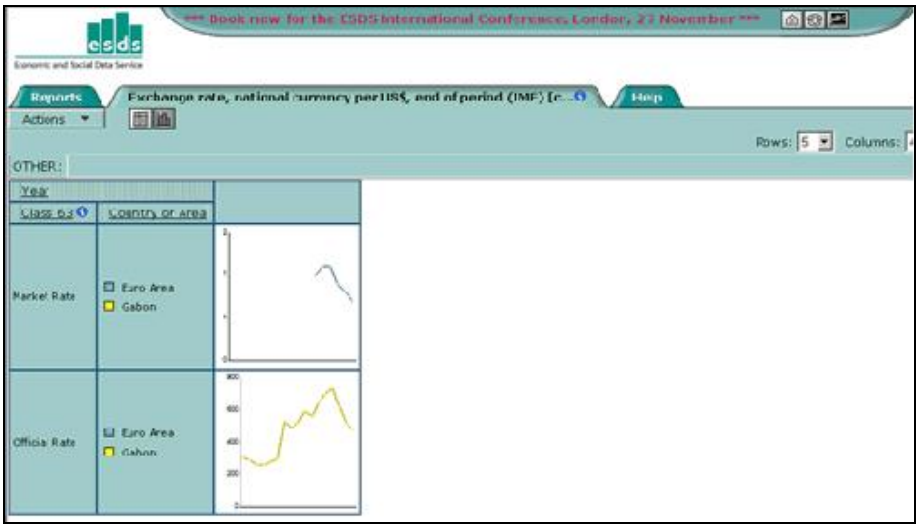


Figure 9: Line chart for Euro Area and Gabon exchange rates

Task 2:

Comment briefly on each of the six countries' rates.

View our comments here and compare them with your own thoughts. Do your observations and interpretations of the data match ours?

China Hong Kong

Now a special currency for an area which is part of China but retains its own currency - the Hong Kong Dollar. Although the rate is specified as a market rate, Hong Kong and Chinese authorities have pegged it to US dollar, hence its virtually unchanged value over the period.

Euro Area

A common currency for most countries in Europe introduced in as an accounting currency in 1999 with notes and coinage following in 2002. It is fully convertible to other currencies and is hugely traded on foreign exchange markets. The Euro's exchange rate is not pegged to any other currency. On average it has increased in value compared to the US dollar since its introduction.

Gabon

Gabon uses a currency in common with a number of other African countries, the CFA Franc. On the graphs you will notice that its exchange rate has changed almost identically with the Euro. This is because it is pegged to the Euro. Its exchange rate is described as official. Exchange rate changes therefore represent changes in the trading conditions of the Euro, rather than the CFA franc.

Russian Federation

The Russian currency, the rouble, is officially fixed. You will notice however that's rate has changed over the later part of the time period. The Russian authorities tend to follow the market. The major devaluation in 1998 was caused by a major financial crisis in Russia, following the East Asian financial crisis.

Thailand

The baht was pegged to dollar until 1997 when it was floated as a response to a major financial crisis. Hence its single value till that date. Currently the baht is subject to foreign exchange market pressures, but the central bank retains some control over convertibility.

United Kingdom

Pound sterling floats on the foreign exchange markets and is not the standard instrument used to regulate the UK economy. The value of the currency has remained close to that of the US dollar.

Each of the currencies illustrated, except the UK, have experienced different management and control regimes in the recent past. In each case the institutional regime and historical circumstance has been important in setting values. Some care is therefore needed in drawing comparative conclusions about them or their implications for their economies.

Activity 5: Comparison of 'GDP per employee' with 'GDP per hour worked'

This activity has three parts try these tasks yourself before looking at our solutions.

Task 1

Using the ILO KILM database produce a table and chart of 'GDP per employee' and 'GDP per hour' series for France, UK, US, Germany, Japan for 1980-2004.

Your table and charts should look something like this:

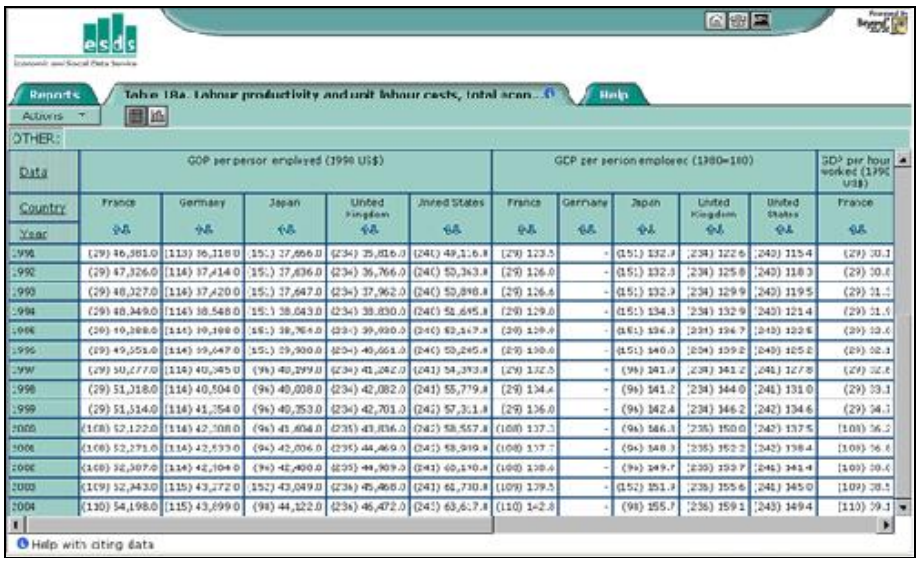


Figure 10: Table for 1980 - 2004

Your charts should look as follows:

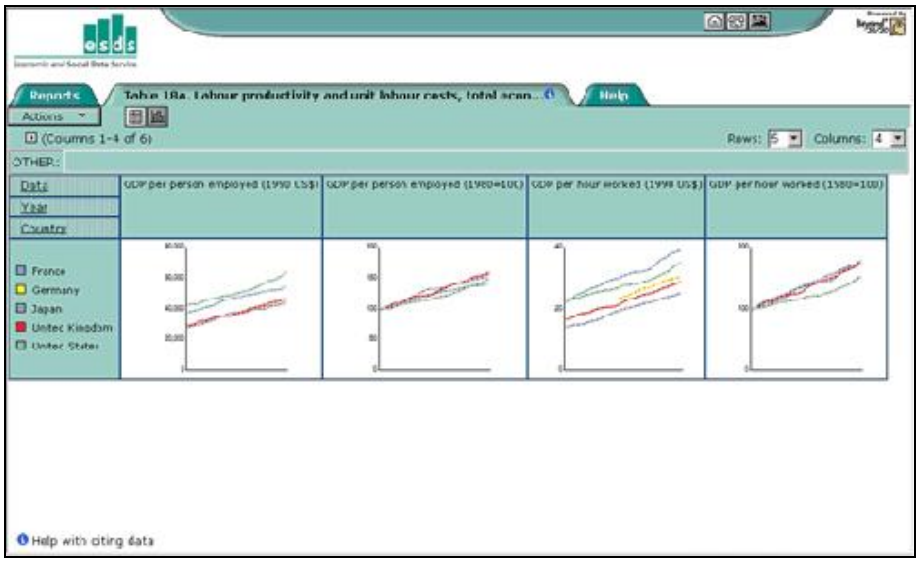


Figure 11: Chart for 1980 - 2004

Click on each 'Beyond 20/20' chart to enlarge.

The 'German' chart starts half way through the period because the reunification of 'East' and 'West' Germany occurred in the middle of the period. That is why Germany does not appear in the indices tables or charts. It did not exist in the common base year 1980!

Task 2

For the year 1999, find 'GDP per employee' and 'GDP per hour worked' for each of the above countries.

Your table and charts for Labour Productivity in 1999 should look something like this:

On the 'labour productivity' table you should have deleted all series except 'GDP per employee' and 'GDP per hour worked', by clicking on 'data' and using the item list.

'Year' should have placed in the 'other' dimension' and all years except 1999 deleted. 'Country' should be in the row dimension and 'Data' in the column dimension.

Your table should look as follows:

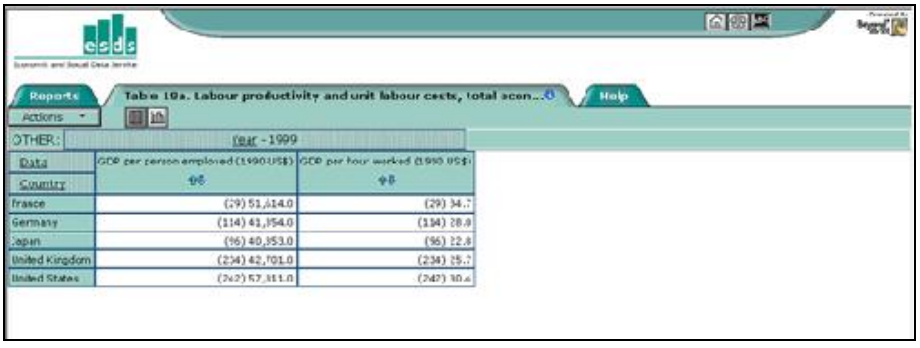


Figure 12: Table Labour Productivity in 1999

To rank on 'GDP per person employed', click the down arrow in the appropriate header. Clicking the 'per person employed' down arrow, you get a table as follows:

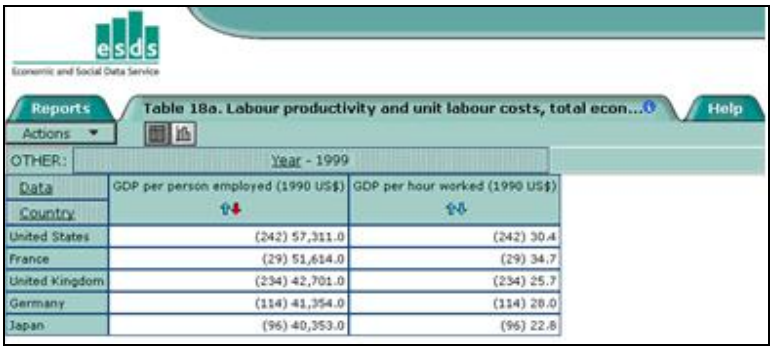


Figure 13: Table Labour Productivity in 1999 - per person employed

***The US heads the list - France is second**. Clicking the 'per hour worked' down arrow gives you the following:*

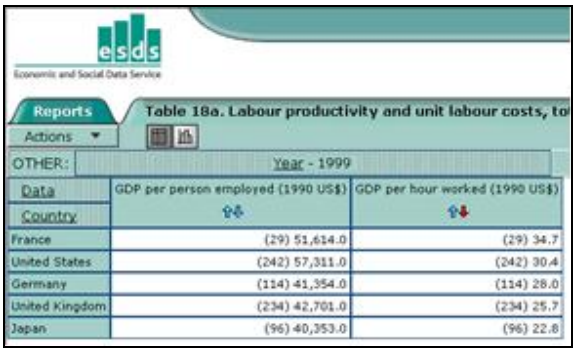


Figure 14: Table Labour Productivity in 1999 - per hour worked

Now France is ahead of the US and Germany ahead of the UK.

Task 3

Comment on the difference between the rankings of countries with respect to 'GDP per hour' compared with 'GDP per hour worked'.

Are your conclusions similar to ours?

Differences between the rankings of countries - brief comment

'GDP per person employed' has risen at a similar rate for all four countries, but 'GDP per hour worked' appears to have grown less fast in the US than in the other three countries.

France has a higher 'GDP per hour worked' than the US but a lower 'GDP per person employed'. This might be because GDP per person in the US is high because on average, employees work relatively long hour, whereas in France, on average, each employee works fewer hours but produces more each hour.

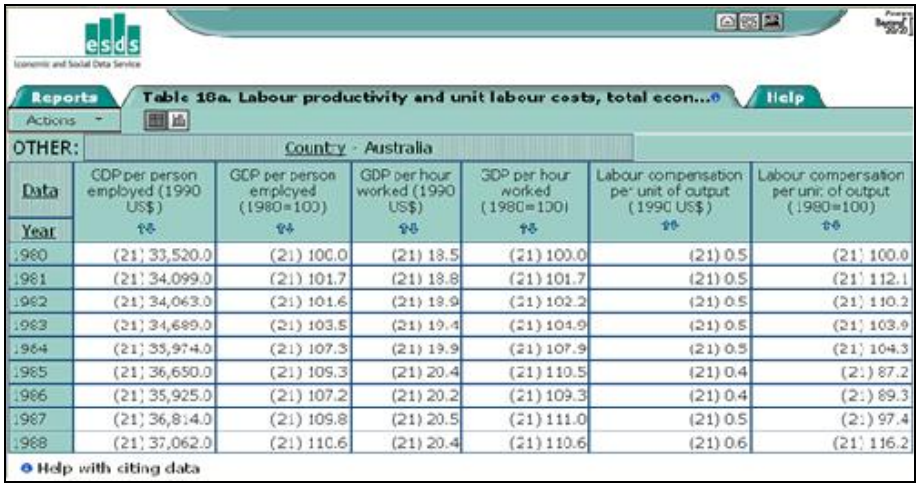
What series might you look for to begin to examine this idea?

Warning: *Checking the metadata by sweeping over the data cells in the Beyond 20/20 tables tells us that the source of 'hours worked' for the US is different from the other countries. An incompatibility might have arisen.*

Activity 8: GDP per head v GDP per employee in Australia

Follow steps 1-8 to produce 'GDP per capita' and 'GDP per employee' results for Australia.

1. **Go to 'ILO KILM' database**
2. **Find 'labour productivity for total economy' series for Australia. It will look as below:**



esds

Reports | Table 18a. Labour productivity and unit labour costs, total econ... | Help

Actions

OTHER: Country - Australia

Data / Year	GDP per person employed (1990 US$)	GDP per person employed (1980=100)	GDP per hour worked (1990 US$)	GDP per hour worked (1980=100)	Labour compensation per unit of output (1990 US$)	Labour compensation per unit of output (1980=100)
1980	(21) 33,520.0	(21) 100.0	(21) 18.5	(21) 100.0	(21) 0.5	(21) 100.0
1981	(21) 34,099.0	(21) 101.7	(21) 18.8	(21) 101.7	(21) 0.5	(21) 112.1
1982	(21) 34,063.0	(21) 101.6	(21) 18.9	(21) 102.2	(21) 0.5	(21) 110.2
1983	(21) 34,689.0	(21) 103.5	(21) 19.4	(21) 104.9	(21) 0.5	(21) 103.9
1984	(21) 35,974.0	(21) 107.3	(21) 19.9	(21) 107.9	(21) 0.5	(21) 104.3
1985	(21) 36,650.0	(21) 109.3	(21) 20.4	(21) 110.5	(21) 0.4	(21) 87.2
1986	(21) 35,925.0	(21) 107.2	(21) 20.2	(21) 109.3	(21) 0.4	(21) 89.3
1987	(21) 36,814.0	(21) 109.8	(21) 20.5	(21) 111.0	(21) 0.5	(21) 97.4
1988	(21) 37,062.0	(21) 110.6	(21) 20.4	(21) 110.6	(21) 0.6	(21) 116.2

Help with citing data

Figure 15: Labour productivity for total economy – Australia

3. **Click 'data' and choose 'GDP per person employed' to give:**

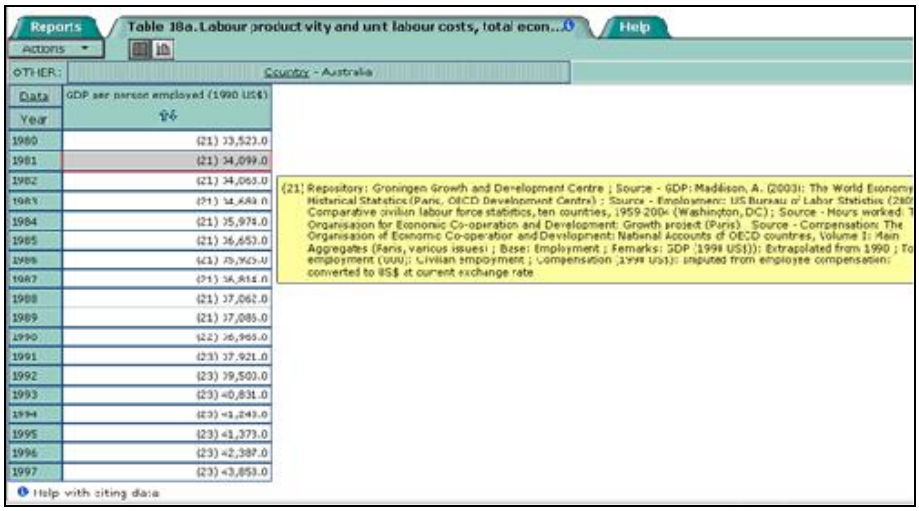


Figure 16: GDP per person employed – Australia

(Note the source and metadata box obtained by sweeping over a numbered data cell)

4. **Click the chart icon and if necessary change dimensions to get following chart:**

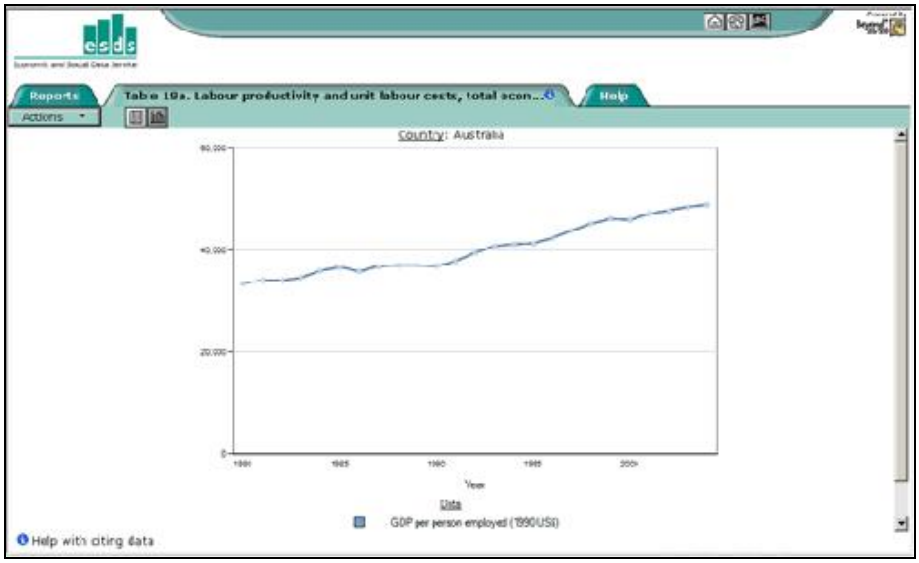


Figure 17: GDP per person employed chart - Australia

5. **Go back to series item list and click 'Macroeconomic, social and human development' series**

6. **Click 'GDP per capita' (i.e. per head of total population) for Australia to get the table below**

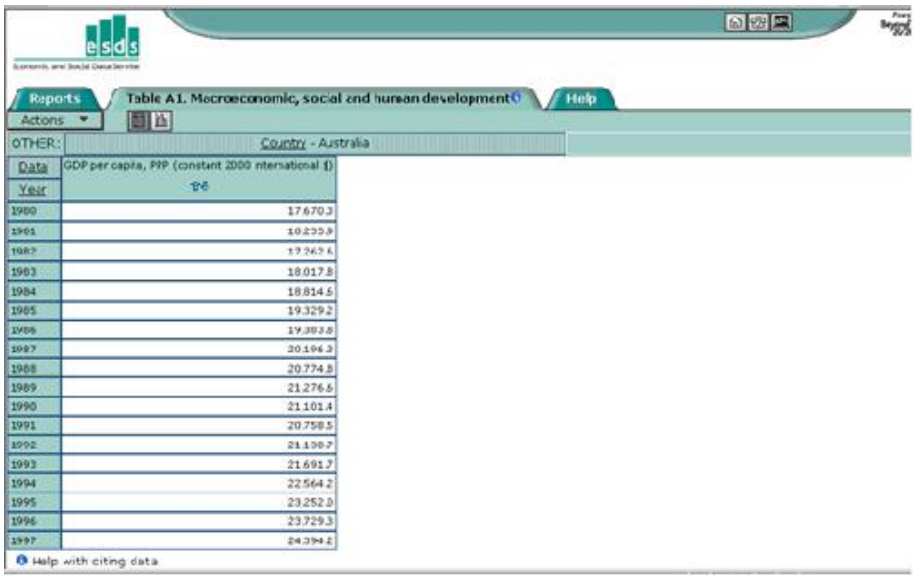


Figure 18: GDP per capita - Australia

7. **Click the chart icon to get the following graph:**

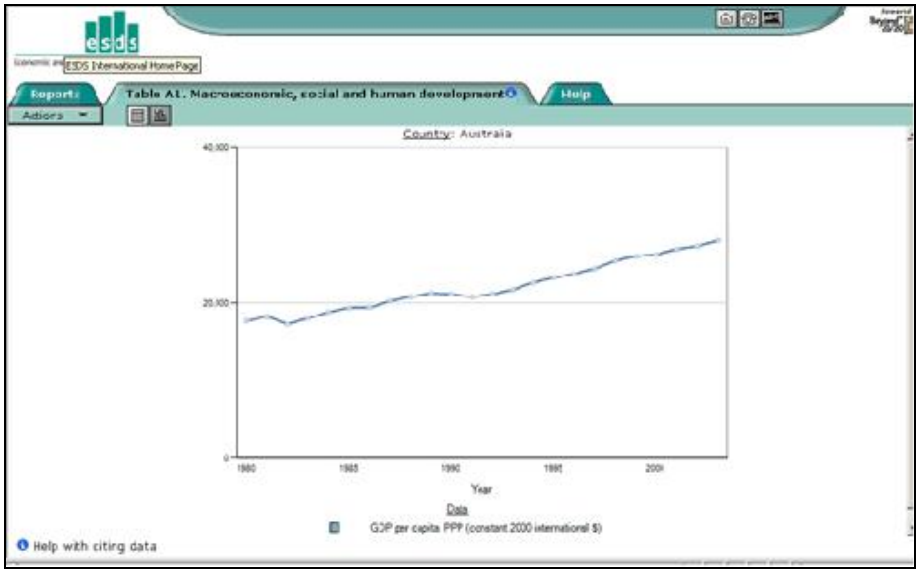


Figure 19: GDP per capita graph – Australia

8. **Now compare charts or tables and see if 'GDP per capita' and 'GDP per employee' have changed in the same direction each year i.e. try to find years in which 'GDP per capita' has gone up but 'GDP per employee' has gone down or vice versa.**

If there are such examples they might occur because:
unemployment rate has changed;
demographic variables have changed;
participation rate (rate that people want to participate in the labour market) has changed.
Note that the two series have values that are very different. This is because they have different base year values: 1990, 2000.

You could produce, on a spreadsheet, indices of the two series based on a common value for a common initial year. You could then plot them on a chart. This would allow an easy visual comparison. But you should be aware that the will be an element of incomparability as the PPP base years will be different.
(Note: GDP per employee is a PPP series although this is not stated in the series header)

Activity 10: Comparing the size of economies

This example looks at two measures of the size of a national economy, GDP (Gross Domestic Product) and GDP per head. It will show how different values for the variables are observed if different means of conversion to a common currency are used. In particularly the difference between using Purchasing Power Parity (PPP) conversion rates and more conventional exchange rates will be highlighted. It suggests that even such an apparently simple comparison as ranking economies by size can be misleading if the correct series is not used.

Various series for GDP are easily obtained from many data-banks on the ESDS International site, but a comprehensive, largely consistent and comparable set comes from World Bank International Development Indicators.

1. **Go to the World Bank data set and choose 'World Development Indicators'. You will get the following list.**

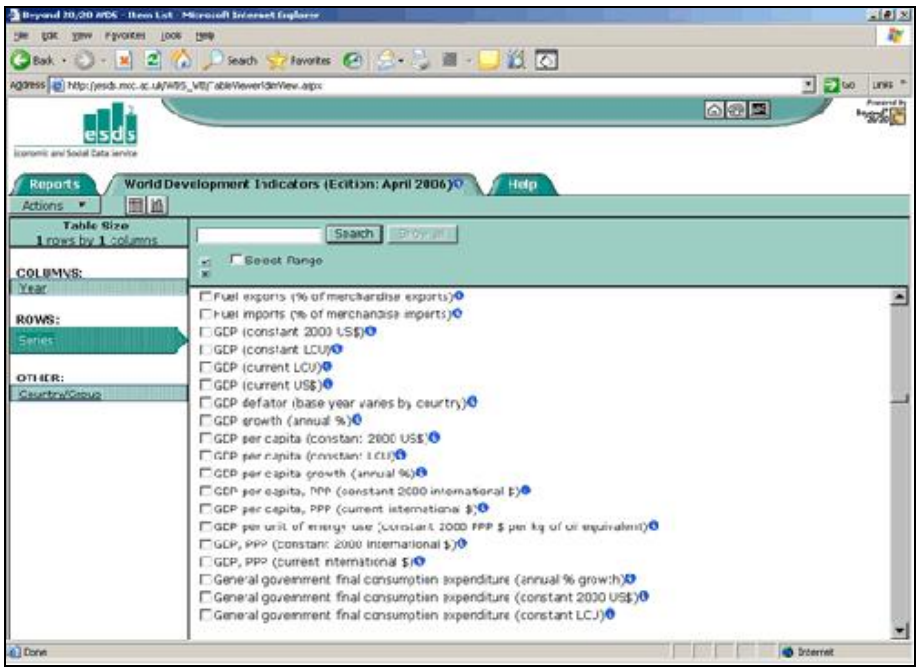


Figure 20: World Bank - World Development Indicators rates

2. **Put the series into the column dimension, countries into the row dimension and date into the 'other' dimension.** If the series list does not show in the main window, click 'Series'.
3. **On the list tick the following GDP measures:**

GDP (current prices US$)	GDP, PPP (current international $)
GDP (constant 2000 US$)	GDP, PPP (constant 2000 international $)
	GDP per capita, PPP (current international $)
GDP per capita (constant 2000 US$)	GDP per capita, PPP (constant 2000 international $)

4. (Note you could do a similar exercise with Gross National Income - GNI (the new gross national product) - by scrolling a little further down the series list).
5. **Using 'Country/Group', select all individual countries (select everything on the list then deselect the aggregate groups such as 'World' or 'High Income: OECD')**

6. **Select the year '2000' in the 'Year' list. Choosing the year 2000 simplifies the exercise as this is the base year for constant price series, but it may be more interesting to choose another year. (Try this exercise choosing another year).**

   Note that GDP per capita (current US$) is missing.

7. **Click the 'View as Table' icon and you should obtain the following table:**

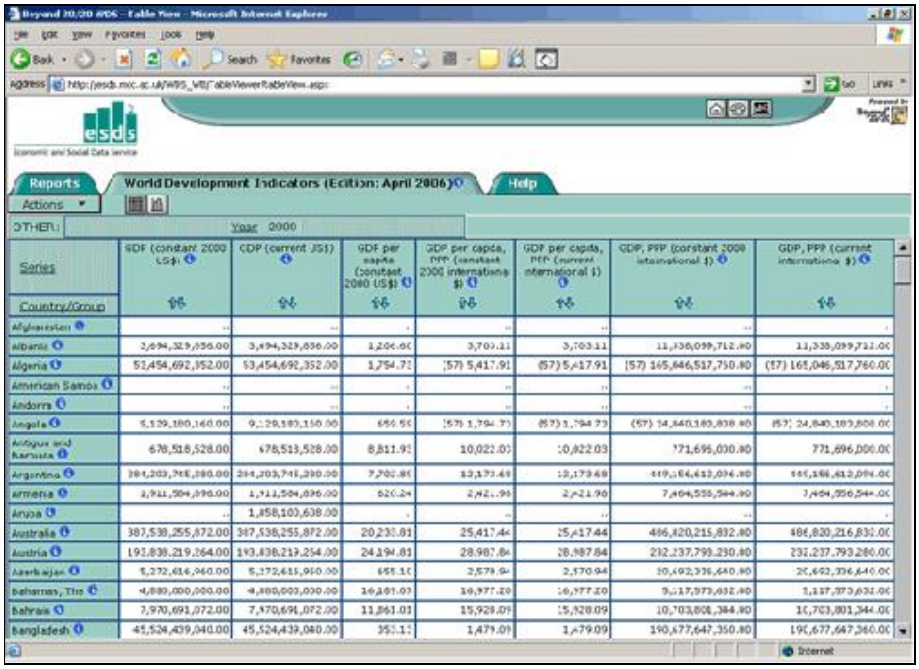


Figure 21: World Bank - World Development Indicators table view

The report has constructed lists of gdp measures for all countries in alphabetical order of their names.

8. **To make this into a league table, choose a particular series and click the 'down arrow' in the series name cell. The table now gives you the series by size of GDP as measured by the chosen series. For example:**

Choose GDP (constant 2000 US$) and click its down arrow.

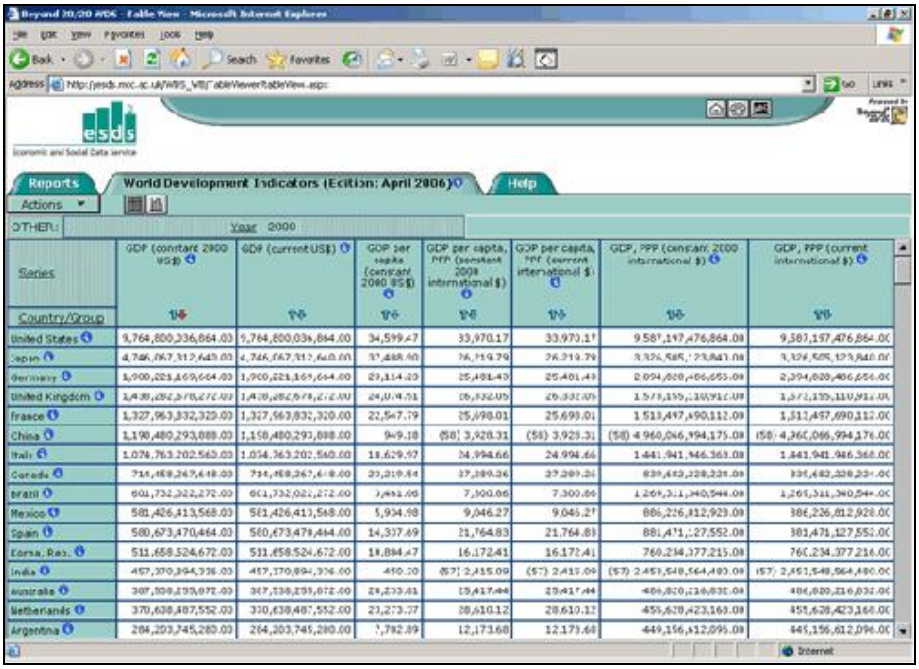


Figure 22: World Bank - World Development Indicators GDP (constant 2000 US$)

In this table the USA is at the top. However note the position of China and India, someway down the league.

9. **Now choose the series GDP PPP (constant international $) and click its 'down arrow'** ⬇

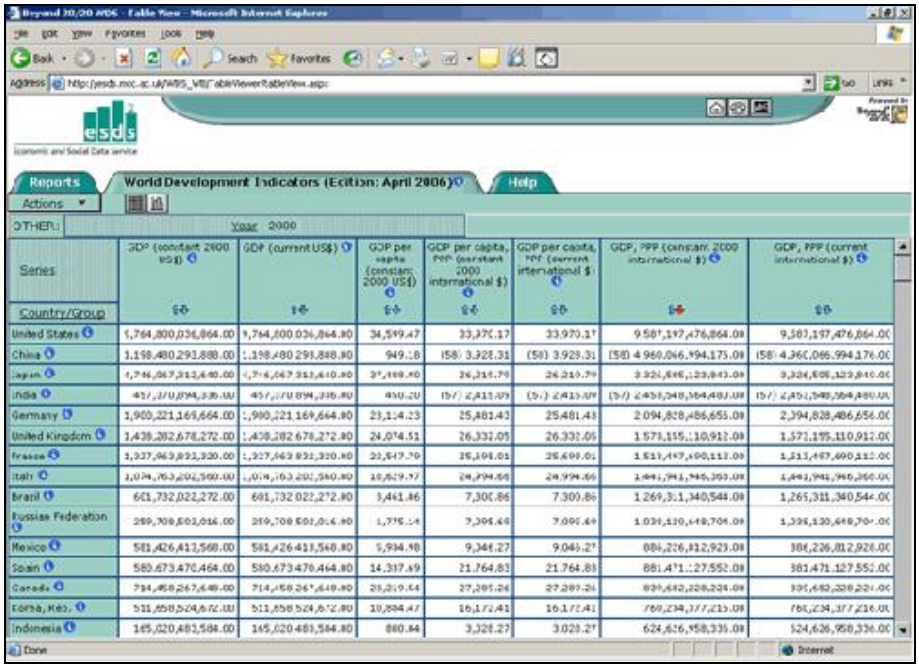


Figure 23: World Bank - World Development Indicators GDP PPP (constant international $)

This gives different positions altogether. USA remains top but now China and India are second and fourth respectively. Quite a change!

Downloading the chosen datasets to a spreadsheet might be a good idea. The spreadsheet will look something like the following:

To download this file to your PC right click on the link below and select the **Save Link As ...** or **Save Target As ...** option.

- Download Spreadsheet [Excel 964 KB]

Normally, if possible, PPP estimates of national economic data are used to make cross-national comparisons. Many ESDS International macro-databanks contain PPP series. Initially try World Bank and OECD databanks to find PPP estimates.

Activity 11: GDP in China and UK

Complete the tasks outlined below before comparing your results with ours.

Task 1

Produce a ESDS International report in table and chart form of GDP of China and UK for the period 1995 - 2004 measured in constant US $s and constant PPP international $s.

How do your results compare with our table and chart?

The tables should look as follows

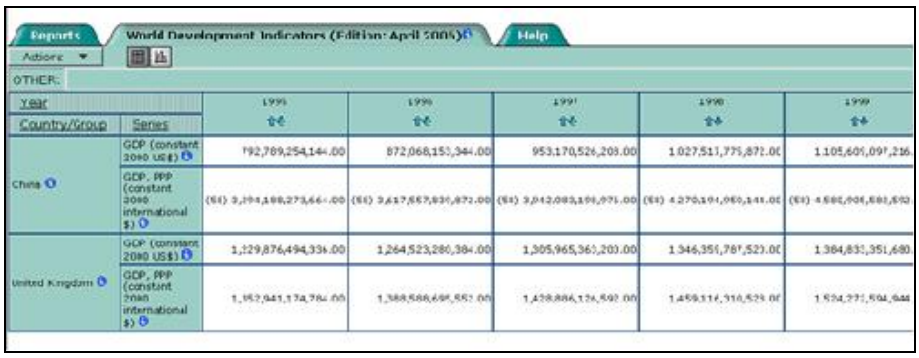


Figure 24: GDP of China and UK for the period 1995 - 2004 measured in constant US $s and constant PPP international $s

*Note that **'Years'** take the column dimension and BOTH **'Country/Group'** and **'Series'** the row dimension. Make sure the **'Country/Group'** set is placed to the left of **'Series'***

*Clicking the **'View as chart'** icon will give a chart for each country. Once a chart appears, choose **'Actions' > 'Select Chart Type' > 'Line'**. Then left click inside a chart to enlarge it.*

This procedure should give the following two charts:

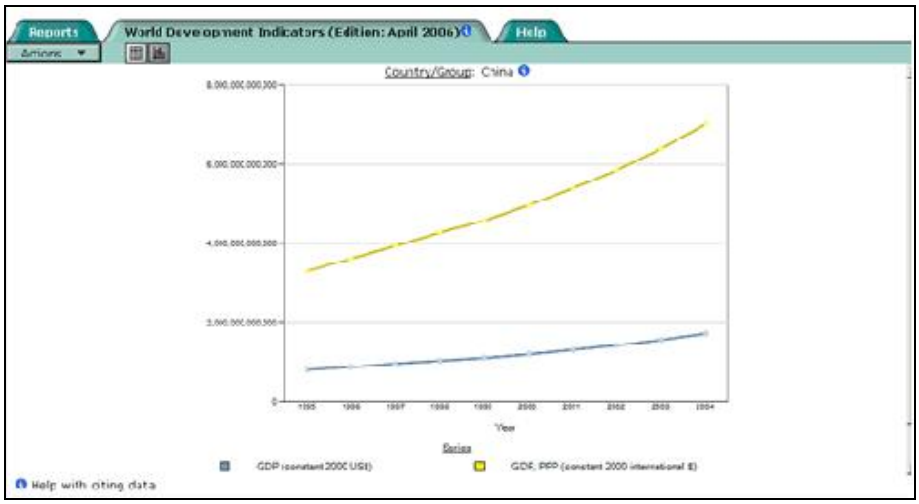


Figure 25: GDP of China for the period 1995 - 2004 measured in constant US $s and constant PPP international $s

and

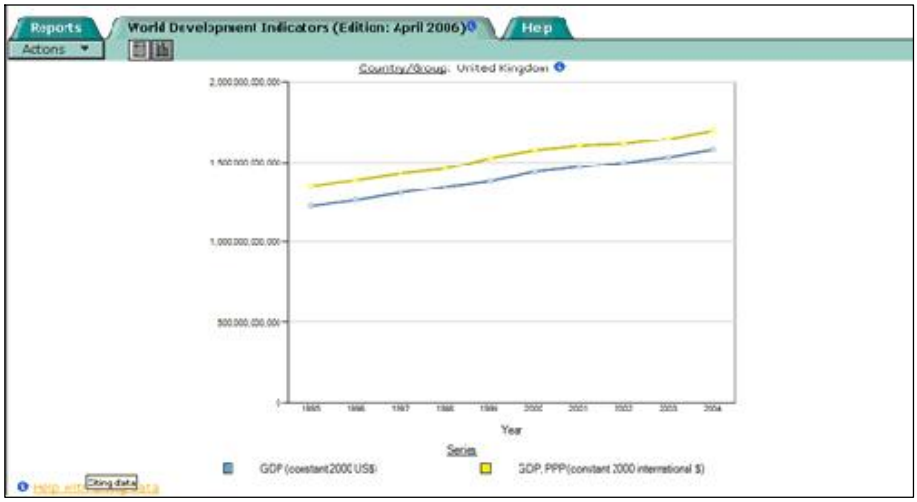


Figure 26: GDP UK for the period 1995 - 2004 measured in constant US $s and constant PPP international $s

To return to the smaller chart, use the command bar ***'Back'*** button.

Task 2

Briefly interpret the difference between US$ GDP and PPP international $ GDP for each of the countries.

How do your results compare with our US$ GDP and PPP international $ GDP interpretations?

The obvious difference between the China and the UK is that China's PPP GDP measure is always considerably greater than its US$ measure whilst the two measures are much closer for the UK.

This means that a US dollar exchanged for Yuan and spent in China will buy considerably more than an actual dollar would buy in the US. The closeness of the UK measures means that a pound Sterling exchanged for Chinese Yuan would also buy a lot more in China than a pound would buy in the UK. In this sense it is cheaper to live in China than the UK.