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The Development of a System of European Regional Purchasing Power Parities

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Abstract

This paper discusses ways in which a system of Purchasing Power Parities defined at the NUTS-2 regional disaggregation could be developed, and what the implications could be for EU policy, particularly the evaluation of Structural Funds and the conclusions made thus far about regional convergence and development.

Currently regional GDP in current prices is deflated using national purchasing power indices, mostly derived from surveys undertaken in the capital cities of the Member States. For some Member States, the national PPPs are corrected for price differences within the country, using spatial correction factors for individual price surveys, given these factors are provided by the countries. Clearly, therefore, for the majority of the countries, these estimates of regional GDP do not take any account of significant differences in cost of living within countries. This paper draws on the preliminary results of a research project being undertaken for Eurostat to examine options for deriving a system of regional prices. Much research has already been published at the level of international prices, partly through the International Comparison Programme (ICP), but little work has been carried out on inter-regional differences.

The paper reviews briefly the theoretical and empirical literature on national PPPs. It then discusses key conceptual issues, including the problem of the difference between expenditure-based measures (used for national PPPs) versus the output-based procedure used to estimate regional GDP. There follows a review of what data currently exists to inform estimates, particularly the detailed tables of consumer price indices (CPI). The paper then concludes the findings and looks forward to further developments of the work.

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1 Background Information

1.1 Background to the study

The Structural Funds Regulations¹ give statutory responsibility to the Commission for calculating GDP on a purchasing power basis at NUTS 2 level. Currently the Structural Funds requirements are met by using national PPPs as the deflators for regional GDPs, which are available in the framework of the regional National Accounts. National PPP have to be used, since regional PPPs have so far never been calculated.

Eurostat is committed to the development of new methods to enable it to measure regional GDP more accurately in each Member State and Candidate Country. This paper presents the first attempts to develop a methodology for regional PPPs in Europe.

1.2 Remaining contents of the paper

Section Two looks at the literature on PPPs from a variety of different perspectives (theory, empirical applications and the lessons to be learnt from the International Comparison Programme (ICP)).

Section Three looks at the principal conceptual issues surrounding regional PPPs. The central questions of this chapter are ‘What is regional GDP?’, ‘What are regional

Section Four explores the data collection issues, particularly how availability of regional sources may act as a constraint on any ideal solution.

Conclusions are drawn of the results of work undertaken so far and the future direction of research.

¹ Regulations No 1260/99 and 1267/99, both of 21 June 1999. The first of these Regulations lays down general provisions on the Structural Funds for the current period, stating that regions at the NUTS-2 level whose per capita GDP, measured in PPPs, is less than 75% of the Community average, are eligible for Structural Funds allocations. It also says that the criteria shall be calculated using objective statistical data. It may be assumed that similar provisions would govern the following period, beginning in 2007. The second Regulation establishes an Instrument for Structural Policies for Pre-accession, stating that an indicative allocation between beneficiary countries shall be made on the basis of the criteria of population, per capita GDP in PPPs and surface area.

2 Literature Summary

2.1 Theoretical literature

PPPs are indices used for international comparisons of GDP and its major components and for comparisons of price levels between countries using real, ie PPP-based, exchange rates. One merit of PPPs is that they overcome the inadequacies of current exchange rates² as a means of making accurate comparisons of the real value of consumption or output. So index number theory underpins PPPs, and index number theory in turn lies at the heart of modern microeconomics and has a long and established literature.

PPPs may be designed to measure economic change **either** where the dimension of comparison is multilateral, ie across many countries or international regions where no one country or region is taken as the base or numéraire, **or** bilateral, for example measurements of change across a period of time in one country or comparisons to a base country. The essential distinction between bilateral price index numbers and multilateral is that the latter should be *symmetrical*, so that comparisons do not depend on the choice of a particular base country.

In a very summary form the procedure of calculating bilateral or multilateral PPPs may be reduced to the following steps.

- 1 Each category of expenditure is analysed into an exhaustive set of basic headings.
- 2 For each basic heading a basket of items is constructed as representative and equally characteristic of expenditure patterns in each country to be compared.
- 3 Prices are collected for these items in each country, with steps being taken to ensure at least close similarity of quality, type of outlet etc.

The resultant price relatives between the countries are then aggregated for each country to the expenditure components of GDP and ultimately to total GDP of each country, with the categories of expenditure weighted according to expenditure patterns in each country. The principal tasks of a study of regional PPPs includes choosing between a

² The PPP is the rate of currency conversion that equalises the purchasing power of different currencies. The argument against using current exchange rates for this is that they do not adequately reflect different price levels between countries and they are erratic. This is a separate issue from the use of PPPs as proxies for 'equilibrium' exchange rates.

bilateral or multilateral approach and deciding which of the foregoing steps need to be replicated at the regional level and in what way.

Rather than repeat a summary literature which is already well established, it is considered suffice to point the reader towards Diewert (1999), who has provided a review of the alternative international approaches and Diewert (2001) which provides the most recent survey of the general consumer price index theoretical literature that also informs the following discussion of PPPs. In addition there are a number of relevant papers recently presented at the ongoing World Bank-OECD seminars on PPPs.

2.2 Empirical literature

Findings from the studies reviewed are presented according to two main foci:

- 1 forces making for divergence or for convergence of prices
- 2 relations between per capita GDP and price levels

2.2.1. Forces for price convergence or divergence

Many studies have been produced on the apparent failure of the ‘law of one price’. A useful summary of the main factors involved in maintaining price divergence and also those forces pushing towards greater convergence can be found in European Economy (2001), which looks at price levels and price dispersion in the EU. Table 2.1 summarises the position.

TABLE 2.1: FORCES FOR PRICE CONVERGENCE AND DIVERGENCE		
	Convergence	Divergence
Micro	Liberalisation of network industries (eg telecoms, energy). Standardisation of tax regimes.	Transport and distribution costs. Imperfect competition (eg branded goods). Market segmentation / consumer preferences. Regulatory and fiscal systems (eg VAT rates). Immaturity of the European retail market.
Macro	Single currency and EMU. Development of the internet and on-line shopping.	Non-tradeable services. Economic policies and their transmission mechanisms.

- Applicability to regional PPPs

Although these forces are normally discussed in terms of their operation between countries, it is worthwhile to ask which are likely to operate on regional prices, and which are less likely to do so.

It is evident that differences between fiscal regimes, tax levels, regulatory structures and economic policies are irrelevant to regional price differences within each country (except, possibly, in countries with a federal structure, as in the case of German Länder). Some of the other forces may well operate differentially between regions, and this would lead to regional divergence in prices. The development of the internet, for example, may well vary according to regional patterns as well as national ones, linked to wealth, education levels, or remoteness from retail centres. Transport and distribution costs might vary between regions, although one study of within-country price differentials (Engel & Rogers, 1995) concluded otherwise. This examined the prices of 14 categories of goods on the CPI for 23 cities in the US and Canada. The conclusion was that, within countries, relative price differences were not affected by distance, but the border effect is very significant. The authors go so far as to say that ‘the border effect on relative price volatility is equivalent to adding anywhere between 2,500 to 23,000 miles between cities’ (p 652).

This raises the question of the relative influence of euro notes and coins (facilitating cross-border trading and price comparisons) versus a ‘border effect’ on price differentials between regions on either side of national borders within the euro-zone. It would be an interesting subject of investigation how far border regions form their own groupings in terms of price levels, and whether this alters the position of border regions in relation to average prices in their own countries.

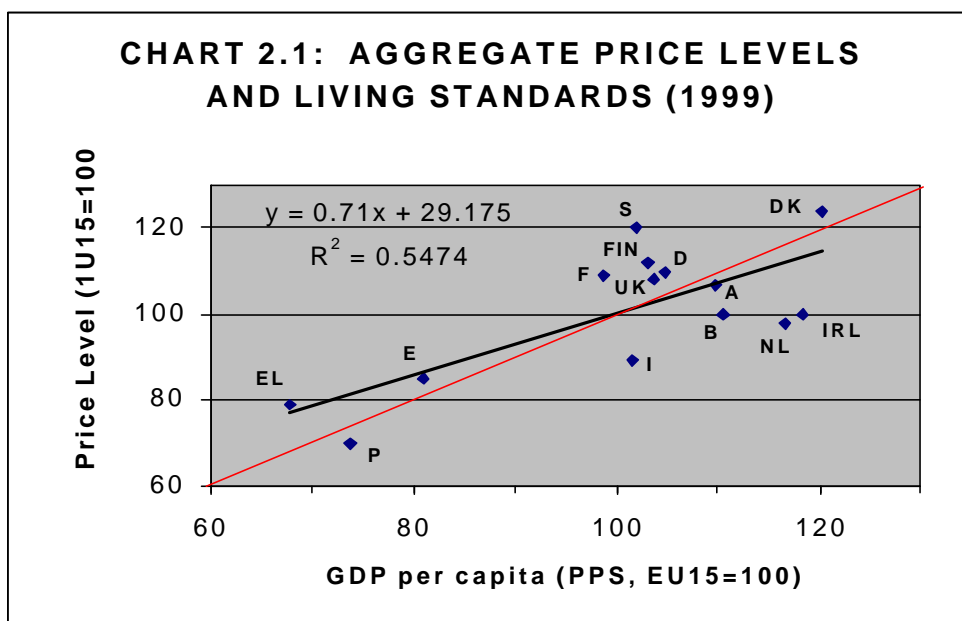
That there may be less of a border effect on prices within the EU than in North America is suggested in the results of two studies reported in an internal document by DG Market (DG Market, 2000). These two studies, part of an ongoing series of surveys of the price effects of the Single Market, covered consumer electronics in ten and fresh food in eleven Member States (including the five largest in each case) The results show that economic causes are at least as significant as borders in explaining price dispersion in Europe. Distribution channels, differences in services related to the goods and local competition conditions together with transportation costs were found to be among the main explanations for regional price differences within European countries. In the case

of consumer electronics, price differences within countries explain up to 40% of the total price variation for some particular product groups. By analysing brand prices (different brands of the same product category with similar features) the price survey showed that brand image can sustain quite large price differences. This suggests a question to be examined in any further research phase: whether it is practicable to make a pre-selection of types of item to be included for price gathering for PPP purposes: price variation for brands is no smaller within a country than between countries.

2.22. GDP per capita and the price level

There is empirical evidence that as GDP per capita levels converge so do prices (see Chart 2.1, which records the situation across the Member States of the EU in 1999).

The Balassa-Samuelson effect (Balassa, 1964, Samuelson, 1964) is the most often quoted attempt to rationalise the empirical findings. The theory is based on convergence in productivity in traded goods and services between poorer countries, where prices are lower initially, and richer countries. One part of the catching-up process involves a convergence in productivity in the traded sector, while in the non-traded sector productivity levels converge much more slowly. The convergence in the traded sector pushes up wages and prices, but this creates rising demand for the non-traded sector and consequently pushes up prices, as the extra demand cannot be met through trade.



Source: Eurostat Structural Indicators

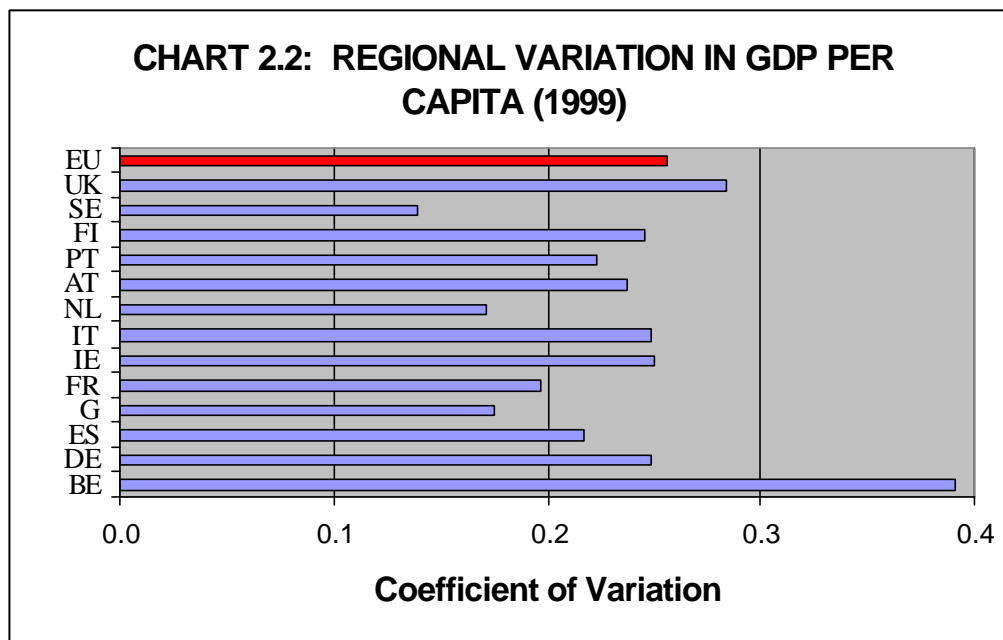
The findings from Rogers et al show that the Balassa-Samuelson effect was probably less important in explaining cross-country inflation differentials in Europe during the 1990s than different rates of GDP growth, the size of the output gap, and openness to trade.

- Applicability to regional PPPs

The foregoing arguments ought also to apply at least at the NUTS 1 and NUTS 2 levels. Disparities in GDP per capita should correspond to disparities in price levels and convergence in the former should lead to convergence in the latter. Indeed, analysis of European regional data has frequently identified the problem that regional divergence coexists with national convergence in levels of GDP per capita. Even when levels of per capita GDP converge between countries, regional disparities do not lessen, or are reduced only very slowly. However, if convergence in per capita GDP across regions is slow, then one force for the equalisation of price levels across regions will also be weak. It must be admitted, however, that the degree of regional divergence may be distorted by the application of national PPPs to regional prices.

Chart 2.2 shows the extent of variation in levels of GDP per capita (deflated by national PPP) across the NUTS 2 regions in 1999. The variance across the regions for each country is calculated, and this is deflated by the average for the whole country to give the coefficient of variation. The figure for the EU is the same average calculated across countries, and so the chart allows a comparison between within-country and across-country variation. However, the EU figure contains Denmark and Luxembourg in its calculations and this skews the results as neither of these countries contains NUTS 2 regions.

If one major determinant of regional price variation is indeed differences in levels of GDP per capita, the results from Chart 2.2 suggest that the UK and Belgium would have the greatest price variation between regions. Next in line would come Finland, Italy and Ireland. Those countries with the lowest variation in GDP per capita between their regions include Sweden, the Netherlands, Greece, and France



Source: Eurostat Regio Databank, October 2001.

2.3 International Comparison Programme (ICP)

The European Comparison Programme (ECP) conducted by OECD and Eurostat, which, since the postponement of the International Comparison Programme by the UN Statistical Commission, is now the only PPP-based comparison programme in operation. Although it is centred on Europe, it also covers North America and Asia.

The principal subjects discussed in this paper are:

- 1 the choice of components of GDP to concentrate on
- 2 price differences between regions and capital cities

2.31. Relevance of GDP components for regional PPPs

Not all the components of national GDP seem equally relevant to measuring the regional welfare: net exports may be safely ignored. Separate price parities are not calculated at national level for final consumption expenditure of private non-profit institutions or for changes in stocks; nor is there any need to do so at regional level. Eurostat's practice is to use parities for the final consumption expenditure of households as the parities for final consumption expenditure of private non-profit institutions and for changes in stocks a parity based on the parities for consumer and capital goods (Eurostat 2000).

- Government final consumption expenditure

Under the ECP and ESA95 final consumption expenditure of government is allocated to final consumption expenditure of households in the case when it is expenditure consumed by individuals: eg education, health and some individual services. The practice in the case of government final consumption expenditure (whether consumed individually or collectively) is to use input costs instead of consumer prices, since output prices are not available. Taking inputs as the measures for prices presupposes that productivity in government services does not vary between countries. This assumption has often been challenged, particularly for the UN ICP. OECD (1998, (para 12) points out a similar difficulty arises for inter-temporal comparisons within the same country, but admits that productivity variations over time within one country are likely to be smaller than variations between countries. A fortiori, the assumption of no productivity variation becomes less risky when it applies to within-country comparisons within the same time period, eg a benchmark year.

There is, then, a case for taking these inputs as uniform across all regions of each country outside the capital city, on the assumption, eg, that health staff and teachers of the same grade are paid the same rate everywhere in the country outside the capital city. It may turn out to be necessary to revise that assumption in the course of our work, but if it holds, then national average input prices can be used in calculating regional PPPs, except in capital cities.

There is, however, a separate problem of what counts as one country for our present purposes. One subject to be examined is whether in federal or semi-federal states (Spain, Germany, Belgium, UK), there are large enough differences in input prices for the same type of activity between the constituent units of the state to make it necessary to use input prices not across the whole state but across each country/Land/autonomous region. These, it should be noted, are NUTS 1 regions in Germany and Belgium, NUTS 2 regions in Spain, and larger than NUTS 1 regions in the United Kingdom.

The other main category of government consumption expenditure is collective expenditure, eg defence, policing, economic services, general administration. The inputs for these may provisionally be treated in the same way as for government consumption privately consumed, and therefore data about these prices do not have to be gathered for regional PPPs. Here too there is a possible complication to be examined in states where autonomous regions have budgetary authority over eg policing.

Our conclusion is that regional PPPs can be calculated from national prices for government final consumption expenditure and from regional prices for:

- 1 final household consumption expenditure
- 2 gross fixed capital formation (GFCF)

Of these two components household consumption expenditure is the more important to welfare and relative wealth; it also bulks larger in total GDP. This conclusion accords also with the recommendation in Ryten (1998, 9.2.15) that where NSIs do not have the resources to gather data about all the components of GDP, the most effective use of their resources is to concentrate on household expenditure. Ryten was writing about NSIs in developing countries; but his argument applies to any NSI that has to decide on priorities within the possible uses of scarce resources.

In the case of GFCF, the methods currently being elaborated by Langdon Davies/Planco UK (Astin, 2001) for gathering price data about construction from bills of account might yield data at the NUTS 2 level. Castles' arguments (Castles, 1997, 8.5-8.10) that measuring capital formation as a gross rather than net aggregate (ie not allowing for capital consumption) overestimates the share of capital formation in total expenditures and that GFCF is in any case of limited relevance to the uses of PPPs in measuring welfare, are also worth considering in any future research.

2.32. Price differences between regions and capital cities

To some extent the difficulties discussed in the previous section could be reduced if price collection for regional PPPs in each country concentrated on those goods and services previously identified as differing by more than a (yet to be determined) minimum in price between regions and the capital city. Some of the studies reviewed in Section 2.2 revealed regional price differences within individual countries. This, however, was not the focus of their investigations. Regional prices are collected in each country for the CPI and also to derive the spatial adjustment factors that are used to convert capital city prices into national average prices. Section 4 presents the first stage in a survey of national practices in this area by examining the methods used around the EU by each of the national statistical institutes. The question in the present section is whether such regional price data could be used to reduce the list of items that would have to be priced in order to calculate regional PPPs.

3 Conceptual Issues

3.1 What is regional GDP?

Regional accounts of member states are supposed to be based on the European System of Accounts (ESA95), which is in turn based on the System of National Accounts (SNA93). However, few regional accounts yet satisfy the requirements of ESA95, and in practice regional GDP is obtained in a manner that while consistent with national GDP is based on a series of compromises. Nevertheless the ESA does provide the framework within which an integrated set of conceptually consistent national (and regional) price and volume measures can be compiled.

At national level ESA95 distinguishes *basic institutional units* that own goods and assets, incur liabilities and engage in economic activity with other units. They are grouped into *sectors* that tend to act in a similar way (financial corporations, non-financial corporations, general government, non-profit institutions serving households, households, rest of the world). The system is an interconnected set of double-entry flow accounts and balance sheets that record the values of stocks of assets and liabilities held by institutional units or sectors at the beginning and end of a period. Each flow account relates to a particular kind of *activity* (such as production) and each is balanced by a *balancing item* that measures the difference between the total *resources* and *uses* recorded on the two sides of the account. For example in the goods and services account, resources are outputs, taxes, subsidies and imports, while uses are intermediate consumption, final consumption, gross fixed capital formation, additions to non-financial assets, changes in inventories, acquisitions less disposal of valuables, and exports. Particular balancing items, such as value-added, disposable income and saving container then be used as summarising indicators for a period. These balances are carried forward between periods so as to ensure consistency between the flow accounts and the balance sheets. Such consistency means that important summary balancing measures such as GDP can be calculated in a number of ways³.

The *current accounts* record the production of goods and services, the generation of incomes by production, the distribution and redistribution of incomes to basic

³ From the production accounts or equally from the income and expenditure accounts. In practice these different approaches will give different measures, depending on errors and omissions in collection of data.

institutional units and the uses of income for consumption or saving. The *accumulation accounts* record the acquisition and disposal of financial and non-financial assets and liabilities by institutions mainly through transactions.

The system recognises two kinds of price: basic prices and producer prices. Both types of price exclude transport prices, which are invoiced separately. The basic price is the amount per unit receivable by the producer from the purchaser including subsidy received, but minus tax paid. Producer prices exclude VAT or similar deductible taxes but they also exclude subsidy received. VAT is recorded as payable by purchasers.

The production account has only one item on the resource side, namely output, but this can be valued at either basic or producer prices. On the uses side, the production account differentiates between intermediate consumption (the goods and services used up in producing output) and consumption of fixed capital (resulting from wear and tear). The latter makes the difference between gross and net value-added. Thus,

$$\begin{aligned} \text{Output less Intermediate consumption less (taxes less subsidies)} \\ &= \text{Gross value added} \\ &= \text{Net value added plus consumption of fixed capital} \end{aligned}$$

Under the ESA95 definition, the term GDP denotes GVA *plus* taxes (less subsidies) on products and at producer prices. In practice most regional calculations are at basic prices; and so it is only for the economy as a whole that gross value added corresponds to gross domestic product. Conceptually, the sum of GVA for producers in the production account should equal GDP derived by the expenditure method.

Diewert (2002) makes the point that consumption, or expenditures on consumption, may be better than the existing target value of aggregate GDP (per capita). He suggests that GDP may be an incorrect focus since it includes gross investment but does not deduct depreciation. Taking the usual expenditure components of GDP, he suggests focussing on *net domestic regional product*, which is equal to $C + G + (I - D) + (X - M)$ where D is depreciation (or capital consumption allowances). For most regions, it is likely that $(I - D)$ (net investment) and $(X - M)$ (the net trade surplus) will be small compared to $C + G$ and hence, given all the difficulties involved in measuring $(I - D)$ and $(X - M)$ at the regional level, the focus could be on $C + G$. However, even focusing on C, there are some significant problems that need to be addressed: namely, do we look at the global consumption of households who have their principle residence in the

region or do we look at the sales of consumer goods and services in the region to all consumers, including “tourists”? Diewert argues that for welfare purposes, the former concept is more relevant. Existing Eurostat methodology favours the second concept.

3.2 What are regional PPPs?

Regional PPPs calculate the purchasing power of the national currency on the basis of regional prices. They could best be established within member states by a survey method that would apply adjustment factors region by region to national PPPs, on the basis of price relatives between capital city regions and each other region, provided that the necessary data are readily collectable.

The basic purpose of regional PPPs is to enable measures and comparison of the real values and quantities of regional GDP and its main aggregates, as well as comparisons of incomes and expenditures. Because the main interest of such comparisons is what they reveal about welfare the regional PPPs would be calculated from price relatives for typical items of final consumption expenditure on goods and services.

Once the regional PPPs are available, GDP and its main aggregates can be compared in real rather than nominal terms for each region. Regional GDP is typically calculated by NSIs by allocating national GDP to regions using a variety of data sources, and in principle these could come from the income, expenditure or production sides of the regional accounts. In practice, the methods of calculating regional GDP are in a state of transition between the output method and, in all likelihood, some single method (based on income or expenditure) compatible with ESA95. The output method involved pseudo bottom-up methods at NUTS 1 level when enough information was available, and top-down methods at NUTS 3 level, using indicators such as the number of employees or wages and salaries to break down NUTS 1 data. The NUTS 3 data were then added up to obtain NUTS 2 figures. At present a typical approach ‘adds up all income earned by *resident* individuals or corporations in the production of goods and services and is therefore the sum of uses in the income generation account for the total economy (alternatively the sum of primary incomes distributed by resident producers)⁴.’

⁴ UK Regional Gross Domestic Product (GDP) Methodological Guide, ONS 2001.

4 Data Issues

4.1 Regional prices and spatial adjustment factors

In most countries within the ECP the CPI includes prices collected at the level of NUTS 1 or NUTS 2 regions. Furthermore, most countries gather price data for the calculation of PPPs from one or two locations (normally the capital city) within their economic territory and then convert these prices to national averages by means of spatial adjustment factors. In the course of deriving spatial adjustment factors further data are gathered about prices, at the NUTS 1 or NUTS 2 levels.

This section examines how such regional price data are collected and what databases are used. It draws some inferences about the potential utility of these methods and databases for calculating PPPs at the level of NUTS 2 regions.

In all countries taking part in the ECP, consumer prices are collected for PPP purposes through seven separate rolling surveys on a three-year cycle. The spatial adjustment factors, at least in the UK, are calculated every five years.

4.2 Questionnaire to NSIs

There is some uncertainty about precisely which methods are used by the NSIs in each country to derive regional adjustment factors. As part of the formalisation of a recognised technique of spatial adjustment factors, Eurostat has prepared a questionnaire for the NSIs to complete (see overleaf).

At the time of writing this paper the results have yet to be fully analysed, but a brief summary across the Member States follows in Table 4.1 (Denmark and Luxembourg are excluded from the table as their countries are defined as NUTS 2 regions, while Finland had not yet replied to the questionnaire). A brief summary of the main points:

- For most countries it seems that the CPI can be defined at least to the NUTS 1 level, although identification of the capital city is more problematic.
- The relative freedom of the price collectors to choose the items means that such data will not enable price level comparisons, although price changes should be OK.
- Several NSIs list tourist expenditure, and non-traded services in general, as a category which may create important regional price differences.

Fact finding questionnaire about the regionality of national CPIs and related weights

1. Sources for regional price data

- a) What is the definition of the **regional dimension** in your CPIs? In particular, is it some version of NUTS¹ classification or a national regional classification?
- b) Is your **capital city an identifiable region** in CPI terms? If not, is price level in the region in which capital city is located a reasonable proxy for prices in the capital city itself?
- c) What kind of regional **sampling** methodology is used? What are the **sample sizes** in your regions?
- d) If you are using something other than NUTS1 or NUTS2, would it be possible to **re-calculate** the regional classification used for the CPIs to NUTS1 or NUTS2 level or a near approximation?
- e) Are there **quality differences** in data between different regions **for certain items or item groups**? If yes, which ones?
- f) Up to which regional level (NUTS1, NUTS2 or similar national classification) and level of disaggregation of goods and services are your national CPI data robust enough (sufficient sample size and coverage) to calculate:
 - Regional price changes?
 - Regional price adjustment coefficients (region/capital city)?
 - Regional price levels?
- g) Are there regions for which the observation of **sufficient price quotations** (which would allow for the compilation of regional CPIs/regional price adjustment coefficients at NUTS1/NUTS2 level) poses a particular problem? If so, which are the regions concerned? Is it because there is an insufficient number of price quotations for **certain items/item groups**? Or is it a **general** sample size and coverage problem of that region?
- h) Are **centrally** collected prices available at regional level?
- i) Is it in principle possible to compile a regional CPI/regional price adjustment coefficient using information from **centrally** collected prices?
- j) Do you produce or have you (ever) produced statistics or **ad hoc surveys** on regional prices/price levels using prices collected for the purpose of the national CPIs? **Which years** did these studies cover?
- k) Are you aware of any **research** that has been undertaken on regional pricing in your country? If so, could you specify and provide a copy of key papers?
- l) Even if there were no regional CPI information available, which goods or services would you expect to be particularly subject to regional differences?

2. Sources for regional weights

- a) Are there any **sources for regional weights** (e.g. Household Budget Survey, national accounts supply data, regional income measures, regional rent surveys etc)? Do these reflect the consumption pattern within a region rather than the consumption pattern of the inhabitants living there?
- b) If so, at **what regional level** are these weights available (NUTS2, NUTS1 or some national regional classification)?
- c) Which is the **latest year** for which data for regional weights is available?
- d) How often is the regional weight data **updated**?
- e) What is the **quality** of these regional weights?
- f) Do you think national weights could be used as an **approximation** of regional weights?
- g) **Which products/services** do you find particularly **problematic** with regard to regional weights?

¹ The Structural funds are allocated based on the GDP per head in PPS at NUTS2 level, therefore it would be ideal to have the data at this level. If this detailed information is not available, higher aggregations would have to be considered.

TABLE 4.1: SUMMARY OF RESPONSES ACROSS MEMBER STATES TO EUROSTAT QUESTIONNAIRE												
Country	BE	DE	ES	GR	FR	IR	IT	NL	AT	PT	SE	UK
Section 1: Sources for regional price data												
a)	NUTS 3	NUTS 1	NUTS 2	NUTS 0	NUTS 1	None	NUTS 3	NUTS 0	<NUTS 2	NUTS 2	None	None
b)	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes
c)		350000 p	180000 p	725 p	113627 p	None	Varies	n/a	39000 p	93926 p	n/a	n/a
d)	Yes	n/a	n/a	n/a		No	Yes	No	NUTS 2	NUTS 2	n/a	NUTS 1
e)	No	Few	No	n/a	Few	n/a	No	n/a	No	Some	n/a	No
f)	NUTS 2	NUTS 1	NUTS 2	NUTS 0	NUTS 2	n/a	NUTS 3	No	12 r	NUTS 2	n/a	No
g)	Yes	Yes	No	n/a	Yes	n/a	No	No	No	No	n/a	Yes
h)	Yes	No	Yes	Yes	No	No	Yes	No	n/a	Yes	n/a	Limited
i)	No	No	Yes	No	Probably	No	Yes	No	No	Yes	n/a	No
j)	No	No	No	No	Yes	No	No	No	n/a	Yes	Yes	Yes
k)	No	No	Yes	No	No	No	No	No	No	Yes	Yes	No
l)	Most	Non-traded	Specific	Domestic	Rents	Most	Maybe	Rents	Services	Few	n/a	Services, rents
Section 2: Sources for regional weights												
a)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Possible	Yes
b)	NUTS 1	NUTS 1	NUTS 2	NUTS 2	NUTS 1	n/a	NUTS 2	n/a	NUTS 2	NUTS 2	NUTS 2	NUTS 1
c)	2000	1999	2000/01	1999	2000	2000	1999-00	n/a	1999/00	1994/95	2000	2001
d)	N/a	Annual	Annual	Annual	n/a	5 years	Annual	n/a	5 years	5 years	Annual	Quarterly
e)	OK	Good	Depends	n/a	n/a	Good	n/a	n/a	OK	OK	Unsure	Variable
f)	Yes	Yes	No	No	Yes	No	No	n/a	Yes	Yes	No	No
g)	None		Domestic	None	A few	Most	Rare	n/a	Dwelling	None	Rents	Rents

5 Conclusions

5.1 Main findings

The principal conclusions of the work so far are:

- 1 The measurement of welfare is the principal reason for obtaining real measures of GDP.
- 2 We should proceed on the assumption that regional GDP will come to be measured on the basis of expenditure.
- 3 Regional PPPs should be designed to measure expenditure and incomes.
- 4 The price data most relevant to welfare and incomes are to be found in CPI databases and in housing databases.
- 5 We do not know much about how national NSIs gather regional prices for the CPI and for calculating spatial adjustment factors for PPP purposes.
- 6 Nor do we know much about the kinds of regional data available in the housing databases of different Member States and candidate countries.
- 7 We need to investigate the regional components in national CPIs and housing databases.

5.2 Further research

The recommendations for the next phase of work are:

- 1 Follow up the results of the questionnaire Eurostat is sending to NSIs and pursue any other channels for learning of the regional components of CPIs
- 2 Investigate national housing databases
- 3 Establish methods of narrowing the categories of goods and services by excluding those where there is hardly any difference between regional and national prices
- 4 Investigate ways by which price gathering for CPI purposes could approximate the standards required for PPP purposes and thereby enable an increasing number of CPI items to be brought into the calculations of price relatives for PPPs
- 5 Investigate means of gathering data from the kinds of area generally overlooked in current price-gathering exercises, ie sparsely-populated, rural areas.

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6 References

- Astin, J (2001), 'New uses of PPP data within the EU', *World Bank-OECD Seminar on Purchasing Power Parities: Recent Advances in Methods and Applications*, 30 January-2 February, 2001, Washington DC.
- Balassa, B (1964) 'The Purchasing Power Parity Doctrine: A Re-Appraisal', *Journal of Political Economy*, 72, pp.584-596, December.
- Castles, I (1997), 'Review of the OECD-Eurostat PPP Program', *STD/PPP (97)5*, June.
- DG Market (2000) 'Price Dispersion in the Internal Market', internal document (www.europa.eu.int/comm/internal_market/en/update/economicreform/pricestudy.pdf)
- Diewert, W E (1999), "Axiomatic and Economic Approaches to International -87 in *International and Inter-area Comparisons of Income, Output and Prices*, A. Heston and R.E. Lipsey (eds.), Studies in Income and Wealth Volume 61, NBER, Chicago: University of Chicago Press.
- Diewert, W E (2001) 'The Consumer Price Index Number Theory: A Survey', *DEUBC Discussion Paper 01-02*, February.
- Diewert W E (2002), Comments on first interim report: Provision of Statistical Services – CPI and PPP Applications.
- Engel, C and J Rogers (1995), 'How Wide is the Border?', National Bureau of Economic Research, *Working Paper No. 4829*.
- European Economy (2001), 'Price levels and price dispersion in the EU', *Supplement A, No7 July*.
- Eurostat (2000), 'Purchasing power parities and related economic indicators'.
- OECD (1998), 'Purchasing Power Parities and Real Expenditures'.
- Ryten, J (1998), 'The evaluation of the International Comparison Programme', *Report to IMF, UN and World Bank*, September.
- Samuelson, P (1964), 'Theoretical Notes on Trade Problems', *Review of Economics and Statistics*, 64, pp 145-154.
- United Nations (1992), 'Handbook of the International Comparison Programme', DESD Statistical Division, Studies in Method, Series F, 62, United Nations, New York.