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MEASUREMENT OF PPPs FOR HOUSING SERVICES*

Submitted by OECD

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Introduction

PPPs for a basic heading are normally based on prices for identical or closely similar products in the market of various countries. In principle, the same procedure can be followed also in the measurement of housing services. Rent data could be collected for a sample of clearly specified dwellings where dwellings that are typical in each participating country are represented.

There are two major reasons, why this approach does not work in practice in the OECD-Eurostat PPP Programme:

- Comparable base statistics with detailed specified dwellings are not available in countries and collecting data only for PPP purposes would be extremely costly.
- Expenditure on housing services in the national accounts is not strictly comparable between countries and, consequently, even perfect rent data would not necessarily ensure good volume results.

Another option is to rely strongly on national account base data and ensure that there is a full consistency with national accounts and rent data underlying PPPs. In principle, rent data underlying expenditures could be extracted directly from the national accounts base data. This option was in the background when conducting the inventory of methods in the measurement of housing services in the national accounts. However, answers received from countries proved this idea to be unrealistic. Although a stratification method is widely applied, particularly in Europe, it is implemented in very different ways across countries, using different criteria in the classification of dwelling stock. A direct use of such data would be very complicated and still would not ensure reliable results.

In conclusion, it turned out that at least in the short term the best option is to take the present method as a starting point and develop it further.

Developing the rent survey for countries where a rent market exists

In the present method for European PPP comparisons, rent data and associated weights are collected for different kinds of dwellings. Data are collected separately for rented and owner-occupied dwellings. PPPs are estimated for each pair of countries as a weighted average of prices using the country's and the partner country's weights in turn. The preliminary PPP is a geometric average of the two results and the final one is estimated applying the EKS procedure for results on each pair of countries. The coverage of rents is specified in the questionnaire to ensure comparability between countries and at the same time it is asked to take care that data are consistent with the national accounts. Due to institutional differences these requirements might be in conflict and both of them are not possibly met in practice.

Note that the scope of dwellings in the PPP questionnaire (see the table below) is nearly exhaustive. It covers both main types of dwellings, the age classification is exhaustive and all dwellings fall into categories with or without central heating. Only the classification of the size¹ of dwellings is not exhaustive. The lack of small dwellings does not have very much

¹ It should be also confirmed that there are no major differences in the definition of area of dwellings between countries.

importance due to their small weight but the exclusion of apartments with more 150 m² might have some significance. This issue is discussed more closely later on in this paper.

Table 1: Rent survey questionnaire in the OECD-Eurostat PPP Programme

Type	Age	Year	Rooms	Size in m ²	Reference size in m ²	Central heating
Flat	> 49	< 1951	1 - 2	25 - 75	50	No
Flat	> 49	< 1951	1 - 2	25 - 75	50	Yes
Flat	> 49	< 1951	>= 3	70 - 150	110	No
Flat	> 49	< 1951	>= 3	70 - 150	110	Yes
Flat	24 - 49	1976 - 1951	1 - 2	25 - 75	50	No
Flat	24 - 49	1976 - 1951	1 - 2	25 - 75	50	Yes
Flat	24 - 49	1976 - 1951	>= 3	70 - 150	110	No
Flat	24 - 49	1976 - 1951	>= 3	70 - 150	110	Yes
Flat	< 24	> 1976	1 - 2	25 - 75	50	No
Flat	< 24	> 1976	1 - 2	25 - 75	50	Yes
Flat	< 24	> 1976	>= 3	70 - 150	110	No
Flat	< 24	> 1976	>= 3	70 - 150	110	Yes
House	> 49	< 1951	3	70 - 120	95	No
House	> 49	< 1951	3	70 - 120	95	Yes
House	> 49	< 1951	4 - 5	80 - 150	115	No
House	> 49	< 1951	4 - 5	80 - 150	115	Yes
House	24 - 49	1976 - 1951	3	70 - 120	95	No
House	24 - 49	1976 - 1951	3	70 - 120	95	Yes
House	24 - 49	1976 - 1951	4 - 5	80 - 150	115	No
House	24 - 49	1976 - 1951	4 - 5	80 - 150	115	Yes
House	< 24	> 1976	3	70 - 120	95	No
House	< 24	> 1976	3	70 - 120	95	Yes
House	< 24	> 1976	4 - 5	80 - 150	115	No
House	< 24	> 1976	4 - 5	80 - 150	115	Yes

Revision of the estimation method

Experience has shown clearly that it is not enough to simply refer to the ‘consistency with national accounts’ to achieve meaningful results. As a matter of fact, this expression might be even harmful if not carefully defined. The rule that like is compared with like has still to be respected and should not be subjugated to attempts to achieve consistency with national accounts. In the method explained here, both preconditions, consistency with national accounts and comparability, have tried to be met. This does not require major changes in the questionnaire.

In the PPP rent survey, price data and associated weights cover almost the whole dwelling stock. Therefore, it is possible to estimate weighted average of the whole dwelling stock based on the PPP data. On the other hand, the same estimate is available in the national accounts: it is total expenditure divided by total of square meters of the dwelling stock. Consistency with national accounts would mean that these estimates should be equal. In practice they are not but the consistency can be ensured by adjusting the PPP rent data to that level.

Results based on the described adjustment are probably not very sensitive to errors in prices or weights because errors at a detailed level are reflected in the total and at least partly picked up by the adjustment. At least the quantity of housing services (in terms of the size of living area in countries) will look realistic, provided that the data on size of the dwelling stock is comparable. A critical question is whether the quality of dwellings will be properly taken into account. However, this problem is not directly related to the method described but to the rent questionnaire as such. A critical point is whether the set of dwellings in the questionnaire reflects reasonably well the qualities of the dwelling stock. A short discussion on this can be found in Annex.

Box: Adjustment of prices for housing services

This box provides a more formalised presentation of the proposal made in the text. The following notation is used: let w_i^A be the quantity weight of dwelling category i in country A , in line with the rent survey questionnaire (Table 1) and expressed as the share of m^2 of a particular category in the total number of occupied m^2 . Let r_i^A be the corresponding rent, as surveyed in the PPP questionnaire. Further, call \bar{r}_{PPP}^A the average rent as implied by the PPP data, i.e., $\bar{r}_{PPP}^A = \sum_i w_i^A r_i^A$. Next, let \bar{r}_{NA}^A be the average price of rental services as implied by the national accounts. \bar{r}_{NA}^A is the ratio of national accounts housing expenditure divided by the total number of occupied m^2 .

The adjustment proposed in the text is to multiply through all observations on rental prices from the PPP questionnaire by the ratio $\frac{\bar{r}_{NA}^A}{\bar{r}_{PPP}^A}$ so as to obtain a set of adjusted prices $\tilde{r}_i^A = r_i^A \left[\frac{\bar{r}_{NA}^A}{\bar{r}_{PPP}^A} \right]$. It is easy to see that the weighted average of the adjusted set of prices equals the overall average price of rental services as observed in the national accounts: $\sum_i w_i^A \tilde{r}_i^A = \bar{r}_{NA}^A$, implying consistency of results at the aggregate level.

Overall, it is likely that the adjustment provides reasonable results. It is also simple in implementation but some basic requirements have to be met:

- It should be ensured that the scope of the dwelling stock and the definition of size are the same in different countries. Particularly, empty dwellings should be excluded. The scope of the dwellings stock is defined in the EU Directive.

- Weights may be based on the number of rooms rather than square meters. It is unlikely that this causes any significant bias but this should be confirmed. (Small apartments get lower weight if the number of rooms is used).
- Contents of rents underlying expenditure in the national accounts as well as rent data in the PPPs should be the same in different countries. A standard to be adopted should be based on the EU Directive.

Price data provided by countries should be adjusted to meet these requirements. This can be done by adjusting data on rents to the level of standardised average rent (expenditure/size) for the whole country (separately for rented and owner-occupied dwellings). Consequently, if the adjustment is made at the total level, there is no need to collect individual rent data by strictly standardising the contents of rents. It is more practical to collect data as it is available in the basic statistics, and the adjustment made at the total level ensures that the overall results become comparable between countries.

To implement the revision, it should be considered whether the scope of dwellings in the PPP rent questionnaire should be extended to cover the whole dwelling stock and how this should be done. Secondly, some countries might not be able to provide prices and/or for all dwellings in the questionnaire.

The answer to the first question is that the quality of results is unlikely to suffer much if the size classes at both ends are left open. Small dwellings (less than 25 square meters) have a small weight and there is some evidence that the rule ‘increasing size - decreasing rent per square meter’ is not in force for big dwellings. It may also not be too difficult to modify slightly the weights.

Countries may also be unable to provide rents or weights for all dwellings in the questionnaire. One solution would be to change the classification hierarchical and as a last resort, allow countries to provide prices and weights at a more aggregated level. However, rents or weights should not be imputed e.g. assuming that they are equal for different kinds of dwellings as has sometimes been the case in the past. It is better to use other countries’ rent and weight *structures* as proxies and adjust level results at the aggregate level, based on national accounts information.

A question to be raised is also whether there is a strong need to collect rent data every year or adopt e.g. a three year cycle like in other parts of household consumption. Obviously, the dwelling stock changes very slowly which would support the idea of a longer interval but in that case a reasonable way to update results has to be found. Options include:

- Updating using implicit price indices in the national accounts. This is easy to implement and keeps the consistency with the national accounts. A problem is that the volume estimation in the national accounts is not necessarily comparable between countries. Particularly, location is included in the price component in the PPPs but in volume in the national accounts. Some countries might also adjust volumes by taking into account quality development of dwellings but others not.

- Updating using HICP. Again, an advantage is that it is easy to apply. A major problem is that the HICP may not be valid to be used for owner-occupied dwellings. Also the contents of rent in the HICP might differ in various countries.
- Updating using implicit price index based on standardised expenditure data and the development of total area of the dwelling stock. Then, price and weight structures are held fixed with respect to the benchmark year.

At first sight, the third option looks most attractive but a final decision can only be made after testing. It should be also confirmed whether comparable quantity series are available in countries.

Developing the rent questionnaire for countries with no rent market

In the present system, PPP results for countries, where a rent market does not exist, are based on the use of quantitative and qualitative data on dwelling stock. This is not the only possibility. So, there are at least two options:

- PPPs and volumes are estimated in the same framework as for countries with rent market. Countries provide only weights, and average price structures of “market rent countries” (or of similar countries) are used as a proxy in the first round of estimation. Finally, prices are adjusted at the aggregate level using the data on (standardised) expenditure on housing in the national accounts and the total number of square meters. Thus, the procedure is the same as for market rent countries except that price structures of other countries are used as inputs in the first round of estimation. Annual updating requires data on the development of total area of the dwelling stock.
- The present method is continued. It might be also possible to elaborate it further.

In the first method, the use of other countries’ price data might seem striking but, as a matter of fact, it does not differ in this respect essentially from the present method where quantity of the dwelling stock is estimated using average price structures of some western European cities. The price data obtained from rent surveys would only replace these price data. In principle, rent survey data could be even more suitable for this purpose because they cover the whole dwelling stock of countries rather than only cities. A problem of the method is that the set of dwellings in the questionnaire is not detailed enough to reflect properly the quality of dwellings.

However, also the present method is deficient and particularly the quality indicator based on the existence of main facilities is very subjective. There is no information available on their importance on prices and, besides, the importance (if known) might depend on climate and other factors. A second disadvantage is that, due to the use of different methodology, countries should be linked, which means that results depend on the choice of link country or countries. (This problem can be minimised by choosing, if possible, similar countries as links rather than choosing them only on the basis of the availability of data.). Finally, it is uncertain how the method works over time.

The first option looks attractive because of the use of the same framework for all countries. Thus the results would be more transparent and, particularly, it would better ensure that results are more closely comparable with results for those 'market rent countries' that are at the same level of development. Tests have to be made to verify whether the method is viable.

Conclusions

There are a number of options to measure housing services in PPP comparisons. This document has advocated an adjustment to the method in place, which should improve coherence with volume data in the national accounts. The method has been started to be implemented in the Eurostat PPP revision programme for market rent countries by asking them to provide data on the size of dwelling stock in m² as well as on the coverage of rents in the national accounts. Experience gained from the revision will reveal limitations of the method and needs to develop the method further for cases where less base data are available. Also the rent questionnaire should be slightly modified to reflect changes.

Ongoing PPP revision does not cover so far rent surveys for countries where rent market does not exist. Future work is highly desirable to find solutions that provide as transparent and comparable results as possible in this area.

ANNEX: Observations on rent survey questionnaire

An important question is whether the present classification of dwellings stock used in the rent survey is reasonable or whether it could be improved. No suggestions are made here but the relevance of classifications is discussed briefly.

- The importance of **type** of dwelling is indisputable. Its use means also that prices in cities/towns and countryside are at least partly separate.
- **Size** is important because prices per square meter tend to decrease.
- **Age** is most critical. An underlying idea is that dwellings are gradually deteriorating and therefore the quality of services in new dwellings is higher than in old dwellings. However, prices depend on the upkeep of dwellings and countries may be very different in this respect. In addition, the location of new dwellings is often better (city centre vs. suburb). Age might be more valid for houses than for flats.
- **Facilities** are represented in the questionnaire but using only the existence of central heating as a criterion. Certainly this is not enough but there are practical difficulties to add other criteria. Any addition double the amount of prices required if applied for all kinds of dwellings. One possibility is to adopt a flexible approach by asking data by more detailed breakdown if available. This could be expected to widen the difference between countries with higher and lower quality of dwellings. However, overall results would not improve if a more detailed classification can be applied only for a part of countries.

Note that **location** is not used as a criterion in the rent questionnaire, which means that it will be included in the price component in the PPPs rather than in the volume component as in the national accounts. In the national accounts it is one of most important factors in explaining prices. A question is whether it should. At least the following arguments can be found against its inclusion:

- Location can be understood relative. In any country there are good and less good locations, and they are equally distributed.
- Location should, in principle, be taken into account in all basic headings if national accounts rules are strictly followed. Prices in similar locations should be compared rather than taking national averages of prices. If this principle is not generally followed in the PPP comparisons, why to do so for dwellings.
- If implemented, there are a lot of practical problems to be solved. If the rural/urban division is used, how to ensure that they are defined in the same way in countries. It is possible to single out capitals but is it a right solution if some countries have several big cities and some do not. Size of municipalities could be used but they are not internally homogeneous, city borders are drawn differently, etc.

In conclusion, it is not easy to make major changes in the questionnaire. On the whole it would seem relatively sound but additional evidence would be of value. For example, existing hedonic pricing models for housing services could help identifying price-relevant characteristics.
