

ESTIMATION OF IMPUTED RENT IN MONTENEGRO (2003 - 2005)

WORKING DOCUMENT

2007



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The objective of this project was to help Montenegro in reaching European Union standards in macro-economic statistics.

The project focused on the harmonisation of Montenegrin system of National Accounts, and particularly of GDP compilations, with the methodology defined in the European System of Accounts (ESA95).

The Grant, funded by the European Union and managed by the European Agency for Reconstruction, was worth about € 0.5 million and had 3-year duration from 2005 till 2007 included.

The European Agency for Reconstruction is responsible for the management of the main EU assistance programmes in the Republic of Serbia (including UN-administered Kosovo), the Republic of Montenegro and the former Yugoslav Republic of Macedonia.

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Foreword

Annual Gross domestic product (GDP) as the market value of all finished goods and services produced in a country is the most popular indicator to measure the size of its economy. A need to improve the quality of Montenegrin GDP estimates and to render the results internationally comparable has considerably increased since our independence in May 2006. Moreover, following the wish of our country to integrate European Union structures, a process of negotiating a Stabilisation and Association Agreement with the EU has started and foresees, in its statistical chapter, the adoption of European Commission rules, principles and standards for the production of Official statistics. This put a new strain on MONSTAT as the main producer of official statistics in Montenegro.

In order to help MONSTAT to overcome shortfalls in its knowledge of internationally agreed concepts and methodological standards, the European Union is providing us with valuable support through various technical assistance programmes since the beginning of the millennium. Among those programmes, a co-operation started early 2005 with the Italian National Institute of Statistics ISTAT, leading an important project aiming at improving our GDP data.

Among the multiple activities occurred within the frame of that project, the calculation of a specific element of GDP, the imputed rent, was carried-out with the assistance of a high-level expert from Serbia, Mr. Goran Radisavljevic. Similarities with Serbian situation as regards the stock of dwellings and data sources made this choice a strategic and winning one. It makes me great pleasure to confirm that the results presented in the present document basically rely on works accomplished within this fruitful and positive professional co-operation.

It is also worthwhile to mention that MONSTAT bears nowadays full ownership of this new international methodology and is ready to pursue its implementation in the future as long as the conditions will require it.

I consider it as an honour much more than as a duty to underline the exceptional commitment and involvement of all the stakeholders having led to this publication. Let me particularly and specifically mention the valuable contributions of local as well as international team from ISTAT, the fundamental advice of EUROSTAT and the sustained and efficient support of the European Agency for Reconstruction in Podgorica. On behalf of MONSTAT and its staff, be they all warmly thanked for their assistance.

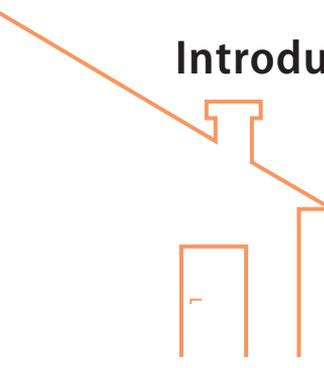
My staff and I are eager to receive our users' comments on this publication in order to improve our future work.

Ilija Stanisic, Director

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Introduction



In its process of approximating and complying with European Union standards and methodology for statistical production, MONSTAT took the decision to integrate in its GDP compilations, to the greatest possible extent, the European System of Accounts methodology known as ESA95 methodology¹.

An important component of this methodology refers to estimation of what is known as **imputed rent of owner-occupied dwellings**, which is based on the assumption that owner-occupants are in the rental business and that they are renting the houses in which they live to themselves: As tenants, they pay rent to the landlords (that is, to themselves); as landlords, they collect rent from their tenants (that is, from themselves), they incur expenses, and they may have a profit or a loss from the rental business. If, for example, we consider two people leaving in each other's property, two financial transactions would take place in such a case as each of them pays a rent to the other. However, if they are both owner-occupiers i.e. they leave in their own property, we would still have two owners and two occupiers but the money does not change the hands and the transactions would no longer go through the market. The amount that would have changed hands - had the owner and occupier been different persons - is called the imputed rent. The effect of owner occupancy is therefore that the imputed rents disappear from measures of national income and output, unless estimated figures are added to take them into account. Therefore, there is a need to adjust income measures to take into account the "imputed rent" enjoyed by owner-occupiers as part of a non-cash income participating in GDP compilation.

While in its Decision 95/309 from 1995 the European Commission recommends estimating the imputed rental of owner-occupied dwellings using a stratification of the housing stock and the associated actual rents, the situation in Montenegro is that the rented part of dwelling stock is small,

unrepresentative and not evenly distributed over all parts of the country. Indeed, according to the last census of 2003, the rented dwellings constitute less than 10% of the total dwelling stock. In addition, there is a large disparity between private and other paid rents. As an alternative objective assessment, the European Commission proposed to apply a methodology called the user-cost method and set specific guidelines for its application.

Following these guidelines and using the data available in Montenegro, MONSTAT has produced for the first time estimates of the imputed rent for the years 2003, 2004 and 2005. These estimates have been incorporated in the preliminary GDP 2005 and revision of GDP 2004 data. Currently, MONSTAT is producing estimates of imputed rent for the period 2000 – 2002, which will be included in a revision of GDP data for that period.

The present document is explaining in details, to all users, how MONSTAT calculated the value of imputed rent. Throughout the detailed tables, the reader will be able to assess what importance has this item for Montenegrin economy and how it impacts on the size of its GDP.

¹ The ESA95 was approved as a Council Regulation in June 1996. A number of changes have been introduced since then, in the form of legal amendments. The legal acts that modify the ESA95 methodology (i.e. annex A of Council Regulation 2223/96) are the following:

- Council Regulation 448/98 on financial intermediation services measured indirectly (FISIM)
- Commission Regulation 1500/2000 on general government expenditure and revenue
- Commission Regulation 995/2001 on taxes and social contributions
- EP/Council Regulation 2558/2001 on settlements under swaps arrangements and under forward rate agreements
- Commission Regulation 113/2002 on revised classifications of expenditure according to purpose.

1. Methodological Framework



Having in mind that official measure of GDP and other aggregates are used in formulating economic policy and to determine the amounts of transfers paid to and received from the European Union, the European Commission (EC) tries to ensure that

the national accounts of Member States (MS) are estimated using comparable methodologies. To this end, the EC has given a detailed statement of how dwelling services are to be measured by all of the Member States using the so-called “stratification method”². This method essentially involves dividing the stock of dwellings of a country into various strata, sampling the actual rents paid for dwelling services to estimate the average rent paid in each stratum, and valuing the dwelling services of all units in a given stratum by the product of the number of dwelling units in the stratum and its estimated average rent per unit.

For many of transition countries, however, it became clear that there were a number of fundamental reasons why they would not be able to comply with the Council Decision. The stratification method requires large scale and expensive rent surveys that are too costly for most transition countries. More importantly, the private rental sector in each of those countries is relatively small, very specific, and unrepresentative of the other parts of the housing market. Having to abandon the goal of stratification, the international community, under EUROSTAT/OECD impulse, gave an overview of the estimation methods and data sources, considered various methodological problems, and this exercise resulted in an alternative methodology to the stratification method called user-costs methodology.

The estimates on dwelling services value in Montenegro for years 2003, 2004 and 2005 were based on this EUROSTAT/OECD methodology as well as on the experience of several comparable European countries applying user-cost method. The whole set of estimations has been elaborated following the methodology that can be found in various

fundamental documents. A first attempt to define and document the user-costs methodology had been the result of a workshop held within the EUROSTAT International Comparison Program 2003–2005 inspired by the needs of Regional Coordinators³. The methodology had been lately improved in a further document⁴ in which special attention was given to the group of countries, including Montenegro, where the dwellings are mainly occupied by owners and not by lessees. Finally, a Synthesis report from EUROSTAT⁵ on “Dwelling Services” published in 2003 was also integrated in the research.

It is also worthwhile to mention the valuable inputs resulted from the experience gained during the EUROSTAT/OECD missions in 2005 and 2007 that focused on non-observed economy (NOE) estimations in Western Balkan countries.

The methodology followed in the Montenegrin context for the years 2003, 2004 and 2005 is presented in annex 1 of this working document.

² 95/309/EC, Euratom: Commission Decision of 18 July 1995 specifying the principles for estimating dwelling services for the purpose of implementing Article 1 of Council Directive 89/130/EEC, Euratom on the harmonization of the compilation of gross national product at market prices. *Official Journal L 186*, 05/08/1995 P. 0059 - 0069

³ “User cost method for estimating dwelling services” Luxembourg, March 2003

⁴ “User cost approach 2005”, Derek Blades, November 2005

⁵ Dwelling Services, Synthesis report, report of Eurostat’s ad hoc Commission for implementation of User Cost Approach in EU (ex-) candidate countries, 2003

2. Data Sources



Proper implementation of user-costs methodology requires relying on the larger possible set of different data sources useful for each item that has to be integrated in the calculations. The thorough assessment of availability, coverage or exhaustiveness of

Montenegrin data sources had been firstly realised and resulted in the basic choice of data sources included in the estimations. Results of the assessment are presented in detail in the next chapter, while the following provides a global review of data sources used to estimate the various entries of the user-costs method.

Costs of dwelling maintenance could be derived from two important surveys regularly conducted by MONSTAT. On the one hand, the Household Budget Survey (HBS) and on the second hand the regular surveys on construction statistics.

Since 2005, MONSTAT carries out an HBS harmonized with International standards and with recommendations of Eurostat, which enables international comparability of data. HBS is a sample-based monthly survey collecting data by households about their income, expenditure and consumption. One important use of HBS results is obtaining data to build-up the weights for the main elements to be included in the consumer price index (CPI). The survey collects data about primary elements of personal consumption, as well as data about some important indicators of living standard (dwelling conditions, supply with durable goods, etc.). Variables can be broken down by demographic, economical and sociological characteristics of the households and allow for some socio-economic analysis. Interviewers collect basic data on households characteristics directly (face to face interviews), and households are requested to fill-in a detailed consumption diary during the whole reference month. Variables of HBS follow COICOP classification.

Construction's data are collected through the following surveys: Annual report on construction works, Annual report on buildings built by individual owners, Annual report on consumption of fuel and building materials, Annual report on apartment buildings torn down and dwellings adaptation, and finally Semi-annual report on prices of newly built dwellings.

The latest housing stock data are based on the Population, Households and Dwellings Census carried out in November 2003. Data on housing stock at the end of year are obtained from the census results and from the survey on built and torn down dwellings within a year.

Data about dwelling insurance costs for the reference period 2003-2005 could be collected directly from the insurance companies since Montenegro still did not establish institution which would control insurance companies' data.

Potential data sources for **property taxes costs** are twofold: taxation data collected by the Ministry of Finance and the HBS survey described above. Unfortunately, it was found impossible to obtain data about taxes paid on dwelling ownership from the taxation authorities, while data that could have been owed by the Ministry of Finance were not yet available. On the other hand, HBS is poorly reliable for this type of information, people being reluctant to declare any type of data susceptible to reveal some of their taxation duties. As a consequence, an ad hoc survey has been carried-out to estimate the value of property taxes. This ad hoc survey was a poll conducted among MONSTAT employees in order to obtain data on real estate taxes paid, dwelling size, number of household's members, location, etc. The data obtained through this ad hoc survey were used as an indicator to estimate property taxation costs.

Estimation of net dwelling stocks was based on the results of the successive censuses of population and dwellings as well as on inter-census estimates of variations in those stocks performed by MONSTAT's construction statistics department. Additional estimates were used in order to distinguish net dwelling stock from the part of total dwelling stocks intended for business purposes, which was based on tourism statistics and on data obtained from the Real Estate Administration. Construction statistics department of MONSTAT collects data on dwellings stock using categories and criteria that are not fully in line with National Accounts requirements, which led to the need of estimating net dwellings stock in order to be able to apply User Cost Approach. In particular, the net dwellings stock data have been obtained adjusting the construction statistics data by excluding the dwellings intended for business activities (renting to the tourists), permanently unoccupied dwellings

and dwellings owned by non-residents.

Average price of newly built dwellings

estimates have been based on regular annual survey of construction statistics as primary source, complemented as auxiliary sources by data from newspaper advertisements, real estate agencies and ad hoc surveys.

As by expert's recommendation, the **average age of dwelling stock and life expectancy of dwelling stock** are both based on official construction statistics that are produced by MONSTAT. Life expectancy of dwellings stock is based on number of razed dwellings as by data of construction statistics department but due to a very small sample, data were not used as such and additional estimates have been made.

International recommendation is to use a constant of 2.5% for the annual rate of return in the case this rate cannot be based on real interest rates on housing loans. The latter was the case in Montenegro in the period 2003-2005 where unusually elevated interest rates on housing loans did not allow estimating the annual rate of return on real data. On the other hand the recommended rate of 2.5% has been considered too high for the conditions of the country. Based on experts' estimations, the rate of return for the reference period was 2.28% (2003), 2.35% (2004) and 2.42% (2005).

3. Data Quality and Estimates



Generally speaking, users should consider the quality of source data as being quite satisfactory. Additional experts' estimates, which are very common in such type of work, have been made on the basis of specific surveys and analysis. As

complementary quality-control of the estimates, results benefited from useful advice and comments from international experts.

Although the decision of making a three-year time series of imputed rent necessary to give consistency to the results and provide users with more interesting data, posed slight difficulties due to uneven data quality in the respective period, it has increased the reliability of final data.

3.1 Costs of maintenance and repairs

Problems with data in the series have been identified in the data sources for dwelling repairs costs as well as in HBS and in construction statistics. In HBS, the problems were partially caused by change of the survey method used within the observed series and time needed for stabilizing new methodology, while in construction statistics other kind of problems was faced.

Finally estimated data on dwelling repairs costs showed fairly small share of those costs in total value of imputed rent, much smaller than in other comparable countries, except Serbia. It is expert's opinion that those data are realistic considering the lengthy poverty increase in the countries of the region and strong social and particularly economic restructuring of the whole population. Majority of population usually referred as middle class could not afford any more to set certain funds aside for dwellings repair because their limited budget had to be used for other priorities, while only a small number of privileged citizen was investing in new constructions rather than in maintaining the existing ones.

In the future, final results of both sources used shall be carefully followed-up. It is expected to see them growing relatively faster. Special attention should be paid to distinguishing the so-called small maintenance costs recorded in HBS as a special item (COICOP 04.30.) and that are not part of regular maintenance costs, which we have to observe here.

Also, these costs should not be mixed up with costs for so called investment maintenance although they are very often put together in HBS while construction statistics distinguish them clearly from the costs we observe here.

3.2 Net dwelling stocks

The way of defining the net dwelling stocks within user-cost approach is a bit different than the one used in construction statistics, our main data source. For that reason certain adjustments were found necessary. The biggest problem was to isolate in the net dwelling stocks the part of dwellings for business purposes (renting to tourists, particularly in tourist areas) and the part being the property of non-residents. In this project, this problem was overcome through data obtained from tourism statistics as well as data obtained from the Real Estate Administration.

Although the size of the dwelling stocks of non-residents' property and the part used for business purposes is not of great significance for the total estimate of the dwelling services value in Montenegro, the reliability of these data should be improved in the near future, which can be done in cooperating with the relevant state administrations and/or with relevant municipality services (firstly in Podgorica and coastal region)

3.3 Price of newly-built dwellings

The inconsistency of data quality in the series has been detected in data on prices of newly built dwellings. The reason for this is quite complex. First of all, Montenegro is relatively small but quite diverse country. For the purpose of this survey, it has been divided in four parts: Podgorica as the most representative part, northern part as relatively undeveloped, Cetinje and Niksic as the "bridge" between the two aforementioned, and the coastal region as the most dynamic one.

In the reference period, the construction activity on the whole territory was not equalized and not harmonized with relative share of dwellings in the total dwelling stocks of each above mentioned part. The prices of newly built dwellings in the indicated regions are mutually of small or big difference and their divergent growth has been recorded. This is very typical for the Coastal region and, apart from the attractiveness it has for the residents, one of the

main causes is the presence of foreign investors who are investing in construction of new buildings and dwellings (mainly for vacation) but also for business purposes (hotels and houses for renting to tourists and similar).

As this phenomenon has been quite rare in the Northern part, we could not obtain representative data for each reference year. But we found a solution for the series. The main source was construction statistics – annual survey on prices of newly built dwellings, but we also had to obtain data through some ad hoc surveys – checking the newspaper advertisements, interviewing the real estate agencies, collecting the information from regional (municipality) departments, which helped us to get a better picture of prices scale in different regions.

During the whole reference period, the area of Podgorica was the most representative in both the size of the sample and the residential representativeness and as such it was chosen as the mainstay of the survey. The Northern part, Cetinje and Niksic area did not registered representative new-constructions and we had problems in both kinds of representativeness for certain years in the coastal area.

In the future, if the main source is to be construction statistics, it would be necessary to use all sources used in this compilation, while special attention should be paid to the distinction between prices of constructions financed by non-residents from those financed by residents as well as to the distinction of constructions for business purposes from those for living purposes. In this view, it is necessary to establish good cooperation with certain state authorities / administrations and/or with competent municipal departments especially in Podgorica and in the Coastal region. One should also be attentive about the movement of the part of total new-construction price, which is related to the price of land. This part, which is related to the land, should be excluded in calculation of depreciation. (Table no.3)

3.4 Rate of return used to estimate net operating surplus

The recommended earning rate of 2.5% used by EU candidate-countries, is not fully acceptable in case of Montenegro as the average efficiency of the total economy is burdened with number of risks

and significant impoverishment of the households, therefore the owners' earning rate has been estimated (from 2.0 to 2.5) in the opposite relation with the average interest rates for housing loans in the reference period, which is in line with basic recommendations indicated in the methodological literature.

Taking into account that the interest rate for housing loans significantly decreased during 2006 (down to 7-9% at annual level), it is logical to expect the conditions for full introduction of recommended earning rate of 2.5% to be met in the next period when the interest rate for housing loans comes closer to annual inflation rate and reference rate of the Central Bank.

MONSTAT also intends to continue obtaining the data on dwelling insurance from the dominant insurance company in Montenegro. Moreover, a regular cooperation with this company will be sought, especially in the area related to distinction between the dwelling insurance and the insurance on the objects inside the dwelling. Also, it should be expected that the Central Bank, as it has been announced, sets up the department for the insurance supervision and MONSTAT should accordingly establish cooperation in that area as well.

Data on dwelling taxes should be obtained in the same way that is through a special survey. However, the cooperation should be established with the Ministry of Finance or at least with municipalities, through regional departments, and they should be urged to make the estimates that can be used for this purpose, in case MoF is not recording this specific tax separately.

During the next few years, nobody should expect some significant changes in estimations of net dwelling stocks average age or some big changes in expected lifetime of the average dwelling in net dwelling stocks.

4. Detailed Tables and Final Results

All monetary values in the following tables in EURO.

Table 1. Intermediate consumption (P.2 / ESA95)

Code		2003	2004	2005
UC 01	Expenditure on maintenance and repair of owner-occupied dwellings	4 347 705	5 538 234	6 349 289
UC 02	Gross insurance premiums paid on owner-occupied dwellings	38 584	81 444	89 617
UC 03	Insurance claims paid to owners (minus)	12 134	28 505	34 455
UC 04	Net insurance premiums paid by owners	26 450	52 939	55 162
UC 05	Total	4 374 155	5 591 173	6 404 451

Table 2. Other taxes on production (D.29 / ESA95)

Code		2003	2004	2005
UC 06	Taxes paid by owners on dwelling services	0	0	0
UC 07	Taxes paid by owners on the value of owner-occupied dwellings and their associated land	4 526 725	4 591 019	4 630 975
UC 08	Total	4 526 725	4 591 019	4 630 975

Table 3. Consumption of fixed capital (K.1 / ESA95)

Code		2003	2004	2005
UC 09	Consumption of fixed capital on owner-occupied dwellings at current prices	68 896 737	68 907 973	67 580 331
UC 09	Total	68 896 737	68 907 973	67 580 331

Table 4. Net operating surplus (B.2 / ESA95)

Code		2003	2004	2005
UC 12	Current market value of the stock of owner occupied dwellings at mid-year	3 735 365 246	3 781 535 097	3 801 393 619
UC 13	Rate of return on owner-occupied dwellings in percent per annum.	0.0228	0.0235	0.0242
UC 14	Total	85 166 328	88 866 075	91 993 726

Table 5. Expenditure on owner-occupied dwelling services

Code		2003	2004	2005
UC 05	Intermediate consumption	4 374 155	5 591 173	6 404 451
UC 08	Other taxes on production	4 526 725	4 591 019	4 630 975
UC 09	Consumption of fixed capital	68 896 737	68 907 973	67 580 331
UC 14	Net operating surplus	85 166 328	88 866 075	91 993 726
UC 15	Total	162 963 945	167 956 239	170 609 482

Table 6. Value of net stock of owner-occupied dwellings at current market prices

Code		2003	2004	2005
K.1	Area (sqm) of owner-occupied dwelling units at the time of the most recent census	10 728 589	10 728 589	10 728 589
K.2	Growth rate of owner-occupied dwellings between last census and the middle of the current year		0.0066	0.0095
K.3	Estimated area (sqm) of owner-occupied dwellings in the middle of the current year	10 728 589	10 832 770	10 847 311
K.4	Average cost (per sqm) of newly-constructed dwellings in the current year	624	638	653
K.5	Average net value (i.e. after deducting accumulated depreciation) of a dwelling in the current year, per sqm	348	349	350
K.6	Total	3 735 365 246	3 781 535 097	3 801 393 619

Table 7. Consumption of fixed capital of owner-occupied dwellings at current market prices

Code		2003	2004	2005
CFC1	Mid-year current market value of the stock of owner-occupied dwellings	3 100 353 154	3 100 858 780	3 041 114 895
CFC2	Estimated service life of owner-occupied dwellings, (in years)	72	72	72
CFC3	Depreciation rate for owner-occupied dwellings	0.02222	0.02222	0.02222
CFC4	Total	68 896 737	68 907 973	67 580 331

Table 8. Actual Rent

	2003	2004	2005
Actual rent at market prices	28 673 154	29 080 404	29 333 490
Actual rent at non-market prices	211 437	214 440	216 307
Total	28 884 592	29 294 844	29 549 797

Table 9. Share of imputed and actual rent in GDP

	2004	2005
Share of imputed rent in GDP (%)	10.06	9.40
Share of actual rent in GDP (%)	1.75	1.63
Share of imputed and actual rent in GDP (%)	11.81	11.03
Gross domestic product, current prices (in thous. EUR)	1 669 783	1 814 994

Table 10. Expenditure on owner-occupied dwelling services, in %

Code		2003	2004	2005
UC 05	Intermediate consumption	2.68	3.33	3.75
UC 08	Other taxes on production	2.78	2.73	2.71
UC 09	Consumption of fixed capital	42.28	41.03	39.61
UC 14	Net operating surplus	52.26	52.91	53.93
UC 15	Total	100	100	100

Conclusion

In GDP compilation, imputed rent represents the biggest item of the total household consumption. In Montenegro, the important share of imputed and actual rent in total GDP figures for 2004 and 2005, respectively 11.81% and 11.03%, is higher than in countries with similar social context. This could be partly showing an under-estimated value of GDP linked to the importance of non-observed economy and suggests increasing of all possible efforts to improve the coverage of economic activities and to include estimations of non-observed economy in final GDP figures.

This work, using user-cost methodology, contributes to the compliance of Montenegrin GDP methodology with international standards and therefore improves the reliability of Montenegrin figures for international comparisons.

By gaining experience through this project, MONSTAT statisticians get acquainted with many principles of national accounts compilations, data estimates and they acquired knowledge about dwelling services in Montenegro.

Although this work can be seen as the very tip of the enormous iceberg that represents the work of building a national accounts system fully compliant with international requirements, it is a valuable step forward for the improvement of the institutional capacity of MONSTAT. The elaboration of this working paper is an additional asset stemming from the international co-operation and represents an important progress in communicating with users.

Annex 1: User Cost Approach

Derek Blades: 11 November 2005

Introduction

1. The standard procedure of using actual rents to estimate imputed rents for equivalent dwellings cannot always be applied. This is the case where so few dwellings are rented that rents actually paid cannot be regarded as typical. For example, in some countries, most of the dwellings available for rent are occupied by foreigners or by employees of government or large public enterprises at rents which cannot be regarded as representative, while in other countries, dwellings may only be available for rent in the capital city or other principal urban areas.
2. The following rules are recommended for deciding when the standard approach should not be used:
 - less than 25 per cent of all dwellings in the country are actually rented;
 - more than half of the rented dwellings are occupied by foreigners paying high rents or by government or other employees paying low rents; and
 - rented dwellings are not evenly distributed over all parts of the country.
3. When the standard procedure cannot be used, expenditure on dwellings is estimated by the **user cost approach**. The user cost approach consists of estimating each of the costs that owners of dwellings would need to take into account in fixing a market rent if they decided to rent their dwellings to other people rather than to live in them themselves. These costs (with 1993 SNA codes in brackets) are:
 - Intermediate consumption (P2).
 - Other taxes on production (D29).
 - Consumption of fixed capital (K1).
 - Net operating surplus (B2).
4. The sum of consumption of fixed capital and the net operating surplus can be described as the *capital service* provided by the dwelling and the net operating surplus is sometimes referred to as the *cost of capital*. Here, however, the terms used are those that are used in a national accounts context.
5. Table 1 is in the form of a worksheet and lists the

various data items that are required to impute expenditure on owner occupied dwelling services by the user cost approach.

6. The Table is completed for each type of owner-occupied dwelling that can be separately distinguished in the housing statistics available in each country. At a very minimum it would be desirable to distinguish:
 - Single-family dwellings (houses or villas).
 - Apartments below a certain floor space (such as below 30 m²).
 - Apartments above a certain floor space (such as 30m² or more).
7. The main difficulties in applying the user cost approach as outlined in Table 1 are:
 - estimating the **stock of owner-occupied dwellings**, which is required to calculate both consumption of fixed capital (UC 09) and the net operating surplus (UC 14);
 - calculating **consumption of fixed capital** (UC 09) once the stock has been estimated; and
 - choosing the **rate of return** (UC 13) to be applied to the current value of the stock of owner-occupied dwellings (UC 12) to calculate the net operating surplus (UC 14).
8. Each of these problems is now considered in turn.

Stock of owner-occupied dwellings

9. The standard procedure for estimating the stock of a capital asset is the perpetual inventory method (PIM). The PIM requires long time series on gross fixed capital formation (GFCF) and on prices of capital assets as well as assumptions about the average service lives of assets and about how retirements of assets are distributed around this average. Several countries participating in the ICP 2004 have derived capital stock estimates by the PIM, but most participating countries do not have such estimates so that it is necessary to consider an alternative method.
10. Table 2 is a worksheet that can be used to estimate the value at current market prices of the stock of each type of owner-occupied dwelling. It is designed for countries that only have information from a recent population census on the number of owner-occupied dwellings classified by a few broad types of dwellings.

11. The first step is to draw up a classification of dwellings which distinguishes between the main types of owner-occupied dwellings in the country. The stocks of owner-occupied dwellings will then be estimated separately for each type. A simple three-way classification – single family dwellings (houses or villas) and two size classes of apartments – was suggested above.

Consumption of Fixed Capital

12. Countries that estimate stocks of dwellings using the PIM will already have estimates of consumption of fixed capital. For countries that do not do so, some other method must be used and one alternative method is described here.

13. When the PIM is used, the commonest way of calculating consumption of fixed capital is to assume *straight-line depreciation* – equal fall in value of the asset each year of its service life – and to assume that retirements of assets are distributed around the average service life according to a *bell-shaped mortality function*⁶. This method of calculating consumption of fixed capital can be described as “straight-line depreciation with a bell-shaped mortality function”.

14. This method can be approximated by a simpler procedure in which annual consumption of fixed capital is calculated as a constant fraction of the value of the stock of dwellings at current market prices. This method of calculating consumption of fixed capital is described as “geometric depreciation with no mortality function”.

15. Although it is only an approximation to *straight-line depreciation with a bell shaped mortality function*, *geometric depreciation with no mortality function* offers the important advantage that it does not require countries to have a long time-series of gross fixed capital formation in order to apply the mortality function.

16. For countries that have used the approach described in Table 2 to estimate the stock of owner-occupied dwellings, *geometric depreciation with no mortality function* is the only feasible method. Consumption of fixed capital (CFC) is obtained by multiplying the mid-year value of the net capital stock by the depreciation rate.

17. The depreciation rate used for geometric depreciation is usually written as D/L , where D is the “declining balance rate” and L is the average service life of the assets. D is usually assumed to lie between 1 and 3 and it has been found that for dwellings in Europe and North America, a value of 1.6 produces estimates of consumption of fixed capital that are similar to those that are obtained using straight-line depreciation with a bell-shaped mortality function. In the absence of information to the contrary, it is here recommended that D be set at 1.6. Thus, for example, if the mid-year net value of the stock of a particular type of owner-occupied dwelling is 4000, and if the average service life for that type of dwelling is 70 years, CFC is obtained as $4000 \times (1.6/70) = 91$.

18. Table 3 is a worksheet for calculating CFC. As was explained above with regard to the stock of owner-occupied dwellings, the calculations are made separately for each type of dwelling for which separate information is available.

Rate of return used to estimate net operating surplus

19. Economists assume that people acquire capital assets because the net operating surplus that they expect to earn is at least as high as the interest that they could earn by investing in a financial asset. This reasoning applies whether the capital asset is a factory building, a machine, a truck or, as here, a dwelling.

20. In practice, there are many interest rates that could reasonably be used as the rate of return to estimate the net operating surplus. In countries where there is a well established and widely used system of housing loans, the rate charged on these loans is the best one to use. Where there is no such system in place, the rate on long term (8 years or more) corporate or government bonds could be used. Note that all rates should be on newly issued debt and not the average rate paid

⁶ The mortality function determines what percentage of assets installed in a given year are retired in each of the years prior to the average, in the year when they reach their average service life, and in each year following the average service life. Several different functions are used for this purpose including Weibull, Winfrey and the log-normal distributions. For details see Measuring Capital: Measurement of Capital Stocks, Consumption of Fixed Capital and Capital Services, OECD, Paris, 2001.

on outstanding debt, which reflects rates existing in prior years.

21. In countries where financial markets are less developed, none of these alternatives may be feasible. In this case it is recommended that a standard annual rate of return of 2.5% should be used. This means that the net operating surplus will be calculated as 0.025 times the current market value of the stock of owner-occupied dwellings.

Table 1: Worksheet for estimating expenditure on owner-occupied dwelling services by the user-cost method

Item No.	Description of the item	Value
Intermediate consumption		
UC 01	Expenditure on maintenance and repair of owner-occupied dwellings	
UC 02	Gross insurance premiums paid on owner-occupied dwellings	
UC 03	Insurance claims paid to owners (minus)	
UC 04	Net insurance premiums paid by owners. (UC 02) – (UC 03)	
UC 05	Total intermediate consumption. (UC 01) + (UC 04)	
Other taxes on production		
UC 06	Taxes paid by owners on dwelling services	
UC 07	Taxes paid by owners on the value of owner-occupied dwellings and their associated land	
UC 08	Total taxes paid by owners. (UC 06) + (UC 07)	
Consumption of fixed capital		
UC 09	Consumption of fixed capital on owner-occupied dwellings at current prices	
Net operating surplus		
UC 10	Current market value of the stock of owner occupied dwellings at the beginning of the year	
UC 11	Current market value of the stock of owner occupied dwellings at the end of the year	
UC 12	Current market value of the stock of owner occupied dwellings at mid-year ((UC 10) + (UC 11))/2	
UC 13	Rate of return on owner-occupied dwellings in percent per annum.	
UC 14	Net operating surplus. (UC13) * (UC12)/ 100	
Expenditure on owner-occupied dwelling services		
UC 15	Expenditure on owner-occupied dwelling services. (UC05) + (UC 08) + (UC09) + (UC14)	

Notes to Table 1

UC 01: Expenditures on maintenance and repair are expenditures on replacing or repairing parts of the dwelling that are broken or dilapidated; repairing the roof, replacing window frames, painting the outside of the building are examples. Maintenance and repair expenditures do not extend the service lives of dwellings beyond their previously expected lifetimes and do not involve enlarging the dwelling. (Expenditures of this kind are treated as gross fixed capital formation in the SNA).

Information about expenditures on maintenance and repairs is usually obtained from a household expenditure survey although some countries estimate them from a supply/use table. In some countries expenditures on maintenance and repair of dwellings are incorrectly shown as a separate component of final consumption expenditure of households. When the user cost approach is used, they must be included as part of rents and not as a separate expenditure item. Note also that when countries use the standard procedure, rents will already include these expenditures and showing them as a separate item of household consumption expenditure will lead to double counting.

UC 02: Gross insurance premiums on dwellings should only include insurance on the dwellings themselves and not on their contents; premiums for the latter are a separate item of household final consumption expenditure. When data are available only for the total of both kinds of insurance, the necessary split between the two can be estimated as being proportional to the relative values of the stock of dwellings and the contents.

UC 03: Insurance claims include only the value of the claims for damage to the dwelling itself. As in item UC 02, when data are only available on the total of claims paid on the dwellings themselves and claims paid on their contents, the necessary split between the two can be estimated as being proportional to the relative values of the stock of owner-occupied dwellings on the one hand and the contents of the dwelling on the other.

In some countries it is not customary to insure dwellings so both UC 02 and UC 03 will be zero. Even in countries where dwellings are insured, net premiums usually form less than one per cent of intermediate consumption.

UC 06: Some countries charge taxes on the imputed value of the dwelling services that individuals derive from owning the dwellings they reside in. Taxes on dwelling services are the value of any such taxes. Any subsidies that owner-occupiers receive to assist them in paying current housing expenses, such as government subsidisation of mortgage payments, should be included here as negative taxes.

UC 07: Taxes on dwellings and land are taxes paid on the value of the dwelling units themselves and the land on which they are located. These taxes are often called "property taxes".

UC 09: Consumption of fixed capital on the stock of owner-occupied dwellings is measured at current prices and is sometimes called *depreciation at current replacement cost*. Estimates of consumption of fixed capital should be obtained from estimates of the stock of owner-occupied dwellings valued in current prices. The stock estimates are preferably obtained by the Perpetual Inventory Method (PIM) which is described in detail in the OECD Manual, *Measuring Capital: Measurement of Capital Stocks, Consumption of Fixed capital and capital Services (2001)*. However, many countries that do not have sufficient data to apply the PIM and Table 2 below is a worksheet that gives a method for deriving an approximate estimate of the stock of owner-occupied dwellings that can be used by these countries.

UC 10, UC 11: The value of the stock of owner-occupied dwellings represents the value of the net (or "depreciated") stock of these dwellings valued at current market prices. Table 1 assumes that the estimates of the stock of owner-occupied dwellings refer to the end of each year and so successive end-year estimates must be averaged to obtain mid-year estimates. The procedure shown in Table 2 produces an estimate of the stock for the middle of the year so that this averaging procedure is not required.

UC 13: The choice of the rate of return used to calculate the net operating surplus is discussed below.

UC 14: The net operating surplus of owner-occupied dwellings is calculated by applying the rate of return to the mid-year, current value of the stock of dwellings.

Table 2: Worksheet for estimating the stock of dwellings at current market prices for countries that cannot apply the perpetual inventory method

Item No.	Description of the item	Value
K 1	Number of owner-occupied dwelling units at the time of the most recent census	
K 2	Growth rate of owner-occupied dwellings between the last census and the middle of the current year	
K 3	Estimated number of owner-occupied dwellings in the middle of the current year. ((K 1)*(K 2))	
K 4	Average price of newly-constructed dwellings in the current year	
K 5	Average net value (i.e. after deducting accumulated depreciation) of a dwelling in the current year. ((K 4)*(1-A/L)) See explanation below.	
K 6	Value at current market prices of the stock of owner-occupied dwellings. ((K 3)*(K 5))	

Notes to Table 2

K 1: Population censuses invariably collect some information on dwellings – at a minimum the number of owner-occupied dwellings with some indications of their physical characteristics. The more recent the Census, the better will be the estimate of the stock of dwellings for the current year. Many countries also carry out some kind of *Living Standards* survey and these usually collect detailed statistics on the type of structure and the facilities contained in dwellings.

K 2: The growth rate in the number of owner-occupied dwellings since the last census could be derived from a number of sources. These include gross fixed capital formation (GFCF) statistics, building permits issued, and administrative data on completion and destruction of buildings. In the absence of any information of this kind, it is reasonable to assume that the stock of owner-occupied dwellings grows at the same rate as the population.

K 4: Information on prices can be obtained from various sources including real estate agents, property developers, and advertisements in journals and magazines that specialise in sales of dwellings. An alternative is to obtain information on the costs of new buildings from construction companies or from “public works” departments that in some countries build dwellings for government employees. If a cost approach is used, the cost figure will need to be adjusted to market prices by adding both the

estimated profit margins and the price of the land on which the dwellings are situated.

K 5: Since K 4 refers to the price of a newly constructed dwelling, this price needs to be adjusted downwards so that it approximates the price of a dwelling of average age. To do this it is necessary to make an assumption about how the prices of dwellings decline as they grow older. The simplest assumption, and the one recommended here, is to assume that the prices of dwellings decline by the same amount each year reaching a zero price in the last year of their life. With this assumption, the price of a dwelling of average age ($P_{average}$) will equal the new price (P_{new}) times one minus the ratio of the average age of dwellings in the stock (A) to the average service life of dwellings (L), that is.

$$P_{average} = P_{new} \left(1 - \left(\frac{A}{L} \right) \right) \quad [1]$$

Intuitively, one would expect that if the stock of dwellings is constant because the number of new dwellings constructed each year is the same as the number of old dwellings demolished each year, the average age will be half of the average service life – i.e. ($P_{average}$) will be half of (P_{new}). In the usual case, however, stocks of dwellings are not constant. When stocks are growing or falling, the average age of the dwellings in a stock (A) can be written as:

$$A = \frac{\sum_i^L i(1+r)^{L-i}}{\sum_i^L (1+r)^{L-i}} \quad [2]$$

where:

- L** is the average service life of dwellings,
- r** is the annual rate of growth in the stock of dwellings, and
- i** is the age of dwellings constructed in a given year and takes the values of 1, 2, 3,, L

Note that when a stock of dwellings is stable (that is when $r = 0$), the numerator is the sum of the first L

digits, that is $\frac{L(L+1)}{2}$ and the denominator is L so

that [2] reduces to $(L+1)/2$.

This is the mid-point of the digits from 1 to L and confirms the intuitive result mentioned above.

If the stock is growing, the average age will be less than the mid-point because the number of younger dwellings will exceed the number of older dwellings. (And vice versa if the stock is declining.) When the percentage of new dwellings is growing, the average price will also rise and vice versa if the percentage of older dwellings is rising.

If the stock of dwellings is thought to be growing, the value of A should be calculated with r set at the rate used to calculate K_2 , and L set at the estimated average service life of dwellings. The value of the stock of dwellings (K_6) is then a product of (Number of dwellings in the stock (K_3)), (Price of a newly constructed dwelling (K_4)) and $(1 - A/L)$.

Table 2A gives the values of the adjustment factor $-1 - (A/L)$ for values of L commonly assumed for dwellings and rates of annual growth in the housing stock from -1% to +3%.

Table 2A: Values of $(1 - (A/L))$

Average service life of dwellings	Annual growth rate of the stock of dwellings				
	-1%	zero	1%	2%	3%
60 years	0.442	0.492	0.541	0.588	0.632
70 years	0.435	0.493	0.550	0.605	0.654
80 years	0.427	0.494	0.559	0.621	0.675

Table 3: Worksheet for estimating consumption of fixed capital of owner-occupied dwellings at current prices

Item No.	Description of the item	Value
CFC 1	Mid-year current market value of the stock of owner-occupied dwellings	
CFC 2	Estimated service life of owner-occupied dwellings (in years)	
CFC 3	Depreciation rate for owner-occupied dwellings. $1.6/(CFC\ 2)$	
CFC 4	Consumption of fixed capital formation of owner-occupied dwellings in current market prices. $(CFC\ 1) * (CFC\ 3)$	

Notes to Table 3

CFC 1: The current market value of the stock of owner-occupied dwellings is taken from K 6 in Table 2 above.

CFC 2: The average service life is the number of years that dwellings of this type are expected to remain in use from the year of construction until the dwelling is demolished. The estimate of the average service life is important because it effectively determines the depreciation rate. Estimates of service lives for dwellings vary widely. European countries have generally used service lives of between 50 and 90 years. In the absence of any reliable information, an average service life of 70 years can be used.

CFC 3: A “declining balance” rate of 1.6 is to be used, so that the depreciation rate is $1.6 / (CFC\ 2)$. As noted above, a value of 1.6 has been found to provide a plausible pattern of CFC for dwellings in Europe and North America. With a declining balance rate of 1.6 and an average service life of 70 years, the depreciation rate will be $1.6 / 70 = 0.023$ so that CFC will be calculated as 0.023 times the current market value of the stock of owner-occupied dwellings.

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