

Adjusting for *Ownership of Dwellings* in the OECD System of Unit Labour Cost Indicators

1 Introduction

This note explains why in principle the value added attributed to *Ownership of Dwellings*¹ in the national accounts should be excluded from calculations of unit labour cost measures and then explains how this issue is treated in the OECD System of Unit Labour Cost Indicators.

This note is organised as follows: Section 2 describes the concept of *Ownership of Dwellings* in the national accounts and its relation to unit labour cost measures; Section 3 describes the adjustments that will be made to the OECD System of Unit Labour Cost Indicators to remove the effect of *Ownership of Dwellings*, the methodology used and assumptions made; and Section 4 assesses the effectiveness of the methodology detailed in Section 3 using data from Australia, Canada, the United Kingdom and the United States as examples.

2 The concept of *Ownership of Dwellings* in the national accounts and its relation to unit labour cost measures

The value added of the national accounts item *Ownership of Dwellings* is recorded as part of ISIC division K, sub-division 70: Real estate activities, and contributes between 5 - 10% of total value added (and thus Gross Domestic Product) in most OECD countries². The value added associated with *Ownership of Dwellings* is the provision of housing services by the owner of a dwelling to its occupants, irrespective of whether the owner is also an occupier. In concept, value added comprises a return to the labour of employees (compensation of employees), a return to capital (gross operating surplus/gross mixed income) and a return to government (other taxes less subsidies on production). But in the case of *Ownership of Dwellings* there are no employees, and so it makes no sense to include this activity in a measure of labour costs.

The value added (and gross operating surplus) of *Ownership of Dwellings* is also defined as output (the actual and imputed rentals) less operating expenses (e.g. municipal rates, building insurance, repairs and maintenance, consumption of financial services, real estate agent commissions charged for management of rental properties). It is essentially these operating expenses, which are the outputs of other industries (including the real estate industry), that have labour services attached to them and as such contribute to unit labour cost calculations in their respective industries.

Consequently, the value added component for *Ownership of Dwellings* should ideally be removed from calculations of ULC measures, both for ISIC division K and any aggregates including division K. If it is included it will result in ISIC division K having a larger weight in the denominator (i.e. output) of ULC calculations when combined with other divisions in compiling aggregates. Its inclusion may also distort the comparability of ULC indexes across countries, in particular where there are large differences in the level or, more importantly, changes over time across countries in the contribution of *Ownership of Dwellings* to total value added.

¹ May also often be referred to as “Dwelling services”

² Ownership of dwellings accounts for approximately 9% and 7.5% of Australian and United Kingdom GDP respectively based on 2004 data.

3 Adjusting for *Ownership of Dwellings* in the OECD System of ULC Indicators

ULC measures for activity J_K (Financial and business services) compiled directly using data from a country's national accounts will include the value added of *Ownership of Dwellings* (OD). Ideally, this should be removed from the calculation of ULC measures for activity J_K and aggregates including activity J_K. However, the lack of available data on the contribution of OD to value added for the vast majority of OECD countries has led to the following estimation approach being adopted in the OECD System of ULC Indicators.

3.1 Adjusting current price value added for activity J_K

The purpose of the exercise is to estimate a value for the current price value added of *Ownership of Dwellings* where this is unknown, and then remove this from the time series of current price value added for activity J_K to create an adjusted series.

Terminology

K = activity K of ISIC: Real estate, renting and business activities.

OD = the activity representing ownership of dwellings.

70 = sub-division 70 of ISIC K: Real estate activities.

VA(X) = Value added of activity X

CoE(X) = Compensation of employees for activity X

CoE(OD) = 0 as the activity OD has no associated compensation of employees.

Hence CoE(K – OD) = CoE (K).

b = some arbitrary factor

Methodology

If we start with the basic equation:

$$\text{CoE}(70 - \text{OD}) / \text{CoE} (K - \text{OD}) = b * [\text{VA}(70 - \text{OD}) / \text{VA}(K - \text{OD})]$$

Which we can simplify as follows since CoE(OD) = 0

$$\text{CoE}(70) / \text{CoE}(K) = b * [\text{VA}(70 - \text{OD}) / \text{VA}(K - \text{OD})]$$

If we assume that b = 1, this implies that:

$$\text{CoE}(70) / \text{VA}(70 - \text{OD}) = \text{CoE}(K) / \text{VA}(K - \text{OD})$$

This assumption implies that the ratio of labour cost to value added for SIC 70 (Real estate activities) is equal to the ratio of labour cost to value added for the whole of division K.

Based on the above assumption, we can expand the equation and solve it for VA(OD).

$$\text{VA}(\text{OD}) = [\text{CoE}(K) * \text{VA}(70) - \text{CoE}(70) * \text{VA}(K)] / [\text{CoE}(K) - \text{CoE}(70)]$$

We then calculate a weight reduction factor (WRF) for activity J_K as:

$$\text{WRF}(J_K) = [\text{VA}(J_K) - \text{VA}(\text{OD})] / \text{VA}(J_K)$$

This factor, estimated for each available year, is then multiplied by the annual current price value added series of activity J_K to produce an adjusted current price value added series for J_K. The factor method is used because the factor will need to be carried forward and backwards to equate to the time series length of J_K current price value added from the annual national accounts database (i.e. the time series of data required to perform the estimation is often shorter and not as up to date). Also, some countries factors will be used to estimate other countries where the data required to perform the estimation is not available³. In addition, for a small number of countries (Australia, Canada, Czech Republic, Denmark, Finland, Sweden, United Kingdom and the United States) the OECD has obtained (or derived) an actual time series of current price value added for ownership of dwellings and thus for these countries the factor is calculated on actual data.

3.2 Adjusted value added constant price for activity J_K

A value added constant price series for J_K adjusted for OD is simply formed by rebasing the existing series to have the value of the adjusted current price series in the base year. This implies that a fixed component for the value added contribution of OD equivalent to its estimated proportion in the base year has been removed from the constant price series for activity J_K.

3.3 Adjusted value added constant price for aggregates G_K and C_K

Annual benchmark value added constant price data for the aggregated sectors of G_K (Market services) and C_K (Business services activity proxy) are compiled by annual chain linking using data on current price value added for the component activities as weights. In this process the weight for sector J_K will be the adjusted series as estimated by the process explained in 3.1. These current price series used as weights for the component activities are also summed to derive the value added constant price of the aggregates in the base year. This implies that a fixed component for the value added contribution of OD equivalent to its estimated proportion in the base year has been removed. Consequently changes in this estimated proportion over time will not affect the evolution of the ULC measure other than through slight changes to the weight for sector J_K.

3.4 Adjustments for quarterly value added constant price for J_K, G_K and C_K

As all quarterly indicator data for value added constant price is benchmarked to the annual data which has already been adjusted for OD in the case of J_K, G_K and C_K, these adjustments therefore flow through to the quarterly benchmarked value added constant price (i.e. real output) data used for the quarterly ULC indicators.

3.5 ULC measures for total economy

As ULC measures at the total economy level are compiled directly, the denominator (i.e. output) will include the impact of OD. Consequently annual ULC levels are not comparable between the total economy series and those for activities J_K, G_K and C_K (i.e. the ULC level for total economy will be understated).

3.6 Summary of the assumptions implicit in the adjustment methodology

The adjustment methodology described in section 3.1 and its application to annual and quarterly value added constant price measures of J_K, G_K and C_K as outlined in 3.2, 3.3 and 3.4 relies on two

³ The relevant imputations performed where data are not available for a country are: Poland: Average of Slovak Republic and Hungary; Euro area: Average of France, Italy and Germany; Ireland: Imputed using United Kingdom; Switzerland: Imputed using France; Turkey: Imputed using Greece

assumptions. The first is that the ratio of CoE to value added for SIC 70 is the same as that for division K⁴, and the second is that the growth rate of value added constant price for the industry aggregates are not significantly different if OD is included or excluded – as a fixed proportion of value added constant price for OD is being removed over all years.

It is difficult to test the validity of these assumptions to a great extent due to a lack of data, although the effectiveness of the imputation methodology has been evaluated in Section 4 below for those countries where actual data on the value added attributed to OD was available as well as the components required for the imputation process. The overriding assertion is that making these adjustments, even after taking into account the assumptions they rely on, leads to better quality ULC measures than if no adjustment was made.

4 Assessment of the imputation methodology

Separately reported annual data on the value added attributed to ownership of dwellings and the variables required for the imputation methodology described in Section 3.1 was available to test its reliability for Australia, Canada, the United Kingdom and the United States. Table 1 below shows the actual vs imputed values for the activity J_K weight reduction percentage used to adjust current price data of activity J_K to remove the contribution of OD.

Table 1 Actual vs imputed weight reduction factor to remove OD from J_K value added

Country	Year	1985	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	01	02	03	04
Australia	Actual					0.64	0.64	0.63	0.64	0.65	0.66	0.66	0.66	0.66	0.66	0.68	0.69	0.69	0.70	0.70	0.70
	Imputed					0.62	0.62	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.64	0.65	0.66	0.67			
Canada	Actual	0.55	0.56	0.57	0.58	0.57	0.56	0.55	0.54	0.54	0.54	0.54	0.55	0.57	0.58	0.60	0.61	0.62	0.62	0.62	
	Imputed													0.55	0.56	0.56	0.59	0.59			
United Kingdom	Actual							0.71	0.71	0.71	0.72	0.71	0.72	0.73	0.73	0.73	0.74	0.73	0.75	0.76	0.76
	Imputed								0.72	0.72	0.72	0.71	0.72	0.73	0.72	0.71	0.71	0.71	0.72	0.72	
United States	Actual	0.62	0.62	0.63	0.64	0.64	0.64	0.63	0.64	0.65	0.65	0.66	0.67	0.69	0.72	0.72	0.72	0.72	0.72	0.73	0.73
	Imputed	0.60	0.61	0.62	0.62	0.63	0.63	0.63	0.64	0.64	0.64	0.64	0.65	0.66	0.67	0.67	0.67	0.67	0.66	0.66	0.67

This analysis shows that the technique works well for each of the four countries, and is almost exact in some years although it may have a general tendency to slightly underestimate the true value (particularly in recent years). Whilst this evaluation is limited to this small number of countries, the results give confidence that the adjustment methodology as described in this paper is fit for the purpose it will be used for in the OECD System of ULC Indicators.

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⁴Of course this first assumption only applies to the countries for which the imputation is performed.