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IMPUTED RENTAL
INCOME, TAXATION
AND INCOME
DISTRIBUTION IN
FINLAND

Tuukka Saarimaa*

* Department of Economics and Business Administration, University of Joensuu,
P.O. Box 111, FI-80101, Joensuu, FINLAND,
E-mail: tuukka.saarimaa@joensuu.fi

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Valtion taloudellinen tutkimuskeskus

Government Institute for Economic Research

Arkadiankatu 7, 00100 Helsinki, Finland

Email: etunimi.sukunimi@vatt.fi

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Abstract: This paper analyses the effects of imputed rental income from owner-occupied housing and its taxation on income distribution in Finland. Using micro-data from the 2004 Wealth Survey produced by Statistics Finland we find that owner-occupied housing has a significant impact on the well-being of many households. In 2004 imputed rental income constituted on average about 10 percent of homeowner households' disposable income. Furthermore, including imputed rental income to household disposable income decreased overall inequality measured by the Gini index. The estimated tax revenue forgone in 2004 was 1.9 billion euros amounting to almost 15 percent of the total government income and wealth tax revenue collected that year. On the other hand, the tax subsidy resulting from non-taxation of imputed rental income is skewed toward high-income households who are more likely to be homeowners and also more likely to own outright. The paper also made a comparison of the current tax system where imputed rental income is untaxed to two alternative tenure neutral tax systems where imputed rental income is taxed. The results indicate that the effects on overall inequality depend vitally on the way the increased tax revenue is transferred back to the households. The calculations in this paper ignore any behavioural responses by the households.

Keywords: Imputed rental income, tax subsidy, income distribution.

JEL Codes: H23, H24, R21.

Tiivistelmä: Tutkimuksessa tarkastellaan omistusasujien saaman implisiittisen asuntotulon ja sen verottomuuden tulonjakovaikutuksia käyttäen Tilastokeskuksen vuoden 2004 Varallisuustutkimusaineistoa. Tulosten mukaan omistusasumisella on merkittävä vaikutus kotitalouksien hyvinvointiin. Vuonna 2004 implisiittinen asuntotulo muodosti noin 10 prosenttia omistusasujien käytettävissä olevista tuloista. Asuntotulon sisällyttäminen kotitalouksien käytettävissä oleviin tuloihin pienensi Gini-kertoimella mitattuja tuloeroja. Asuntotulon verottomuus vähensi valtion verotuloja 1.9 miljardia euroa, joka vastaa lähes 15:ta prosenttia valtion tuona vuonna keräämistä tulo- ja varallisuusveroista. Verottomuudesta aiheutuva verotuki suuntautui pääasiassa suurituloisille kotitalouksille, jotka ovat todennäköisemmin omistusasujia ja joilla ei ole asuntolainaa. Lisäksi tutkimuksessa vertailtiin nykyistä verojärjestelmää kahteen vaihtoehtoiseen, hallintamuotojen suhteen neutraaliin verojärjestelmään. Tulosten mukaan asuntotulon verottamisen tulonjakovaikutukset riippuvat paljolti siitä, miten lisääntyneet verotulot palautetaan kotitalouksille. Tutkimuksessa ei huomioida kotitalouksien käyttäytymisvaikutuksia.

Avainsanat: Asuntotulo, verotuki, tulonjako.

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1. Introduction

Housing is an important part of household welfare and a number of different subsidies and regulations have been implemented with the aim of ensuring a reasonable housing standard for all households. One of the most notable features of the Finnish housing subsidy system is the promotion of homeownership through tax subsidies, i.e. indirectly through tax law.¹ Partly due to its lenient tax-treatment, homeownership is the dominant tenure in Finland as about 65 percent of Finnish households are currently homeowners, and even a larger percentage owns a home at some point during their life-cycle. Using the tax treatment of private landlords as a benchmark, the preferential tax treatment of homeowners in Finland consists of the following provisions. First, homeowners do not have to pay taxes on imputed rental income or capital gains. Second, homeowners are allowed to deduct mortgage interest expenses even though the income associated with this cost is not taxed. Finland is by no means an exception in international context in this respect, as in many countries owner-occupied housing is tax-favoured compared to other investments and housing tenure modes.²

The adverse effects of these types of tax subsidies to owner-occupied housing are well documented in the economics literature.³ First of all, lenient taxation of housing compared to other investments leads to slower economic growth because it induces households to over-consume housing. This increases the existing housing stock at the expense of productive or business capital stock in the economy. Second, because of imperfect capital markets households' life-cycle consumption profile is distorted as households need save for a down-payment when buying a house. Third, households are encouraged to hold portfolios that are sub-optimal from diversification point of view. The main argument in favour of subsidising owner-occupied housing is that it creates positive externalities.⁴ Although, the positive (or negative) externalities of homeownership are difficult to substantiate empirically, it seems that the major tax advantages to owner-occupied housing cannot be justified on efficiency grounds. This study uses household level data to evaluate whether the tax advantages can be justified from a distributional point of view.

The tax-favoured status of owner-occupied housing is well understood in Finland. For example, the Government Institute for Economic Research produces

¹ Sometimes these subsidies are referred to as tax expenditures. This terminology highlights the fact that tax revenue lost due to different departures from the benchmark tax system should be accounted for in the expenditure side of the government budget.

² See Hendershott and White (2000) and Englund (2003) for surveys of different country practices and also for a review of the main aspects of taxing housing capital.

³ See, for example, Skinner (1996), Gervais (2002) and Flavin and Yamashita (2002).

⁴ See Dietz and Haurin (2003) for a review on social and private consequences of homeownership. Glaeser and Shapiro (2002) conduct empirical tests on various proposed externalities of homeownership.

annually overall size estimates of different tax subsidies for budgetary purposes. However, there exists no attempt to evaluate the distributional impact of this policy.⁵ The purpose of this study is to fill that gap in some important respects. First, we estimate the income advantage derived from owner-occupied housing and the impact it has on income distribution. In the second phase, we estimate the value of the subsidy resulting from the non-taxation of imputed rental income and provide an outline of the first round distributional incidence of the subsidy. In doing so, we compare two alternative ways of redistributing the increased tax revenue back to the households. First, we consider a scheme where each adult is given an equal size lump-sum transfer. Second, we lower the (flat) capital income tax rate so that the revenue accrued from taxing the larger capital income tax base where imputed rental income is now included stays constant. Unfortunately, because Finnish income taxation is based on incomes of individuals and because the data set used here is aggregated at household level, we cannot consider a reform where labour income taxes are lowered since we do not observe incomes of individual household members. The tax subsidy resulting from the non-taxation of capital gains is not measured in this study because of the difficulty in estimating capital gains. Furthermore, the analysis in this study ignores any behavioural responses from the households to the proposed tax reforms.

This exercise is problematic because imputed rental income comes in non-monetary form as housing services, and thus, is unobservable to the researcher. The paper overcomes this problem by using a hedonic rent regression to predict imputed rental values for homeowners which can then be used as the tax base. The dataset used in this study is the 2004 household Wealth Survey produced by Statistics Finland. This dataset is good for the purposes of this paper because it includes better location information than is usually found in Finnish national level household surveys and allows us to estimate more plausible hedonic models.

Results from previous similar studies from different countries show that including imputed rental income to households' disposable income has only a small effect on overall inequality. On the other hand, most studies find that a tax on imputed rents would be progressive. This, of course, depends highly on whether the tax rate on imputed rental income is progressive or flat, and also on the way the increased tax revenue is returned to the households. Hills (1991) evaluates the distributional effects of tax advantages to owner-occupied housing in Great Britain. He finds that the benefit from the tax subsidies is clearly larger for households in the top income deciles. Follain et al. (1993) find that a tax on imputed rental income would be progressive in the U.S. Yates (1994) uses Australian data and finds that imputed rental income has a significant impact on the

⁵ There are some studies on the distribution of the benefit from mortgage interest deduction, see e.g. Viitamäki (1999). Latest overall size estimates can be found in Government Institute for Economic Research (2007).

well-being of many households, and that, including imputed rental income in households' disposable income slightly decreases overall inequality. Bourassa and Hendershott (1994) go a step further from Yates' results and evaluate the impact of taxing imputed rents in Australia. They find that a tax on imputed rental income would be clearly progressive. Recent contributors to the literature are Frick and Grabka (2003) who evaluate the impact of imputed rental income on income inequality in Great Britain, former West Germany and the U.S. They find that imputed rental income represents a significant share of owner-occupiers disposable income in all countries and including it into disposable income slightly decreases inequality.

Main findings of this study can be summarised as follows. The results indicate that owner-occupied housing has a significant impact on the well-being of many households. In 2004 imputed rental income constituted on average about 10.7 percent of homeowner households' disposable income. We also found that the government loses significant amounts of tax revenue because imputed rental income is untaxed. The estimated tax revenue forgone in 2004 was 1.9 billion euros. This amounts to almost 15 percent of the total government income and wealth tax revenue collected that year. Furthermore, the tax subsidy resulting from the non-taxation of imputed rental income is skewed toward high-income households who are more likely to be homeowners and also more likely to own outright. However, also some low-income households are homeowners and they may find it difficult to cope with tax payments if a tax on imputed rental income is implemented. We also find that the effects on overall inequality depend vitally on the way the increased tax revenue is transferred back to the households. Under the lump-sum per adult transfer scheme income inequality decreased slightly compared to the current system, whereas under the lowered capital income tax scheme inequality clearly increased.

The rest of the paper is organised as follows. Section 2 illustrates the tax subsidy resulting from the non-taxation of imputed rental income. The section also presents the main aspects of current housing taxation in Finland and discusses the benchmark tax system including the choice of deductible items. In section 3 the empirical methodology for estimating imputed rental income for homeowners is presented. Section 4 reports the results of the distributional analysis. Section 5 concludes.

2. Defining the benchmark tax system

2.1 Tenure neutrality

Tax subsidies (or tax expenditures) are usually defined as departures from the normal or benchmark tax structure that result in favourable tax treatment of particular activities or taxpayer groups.⁶ The concept is based on the notion that any income tax structure has two basic elements. The first element consists of the structural provisions necessary to implement the income tax on individuals and corporations, such as the determination of income, the rate level and the tax subject. This element constitutes the so-called normal tax structure. The second element consists of special provisions that deviate from a neutral tax system and are designed to favour particular industries, activities or taxpayer groups. Thus, the second element can be used to promote certain activities and to achieve social objectives the same way as direct expenditure programs.

Defining a benchmark tax system for residential housing is difficult because of the dual role a house serves both as consumption good and as capital investment. As a generator of housing services, a house satisfies consumption needs, and as an asset, a house is taken into consideration when making investment decisions. To put it in another way, a house is a piece of capital that is used in producing a consumption good, i.e. housing services.⁷ These issues are very important when considering what provisions in the tax code actually constitute a tax subsidy to homeowners.⁸ Basically, there are two stands that one can take. First, a house can be seen as a piece of capital that produces an income stream to the owner. For landlords this income comes in monetary form as rental payments, whereas for homeowners the income comes implicitly in the form of housing services or as imputed rental income. Furthermore, both types of owners may receive capital gains or capital losses as house prices fluctuate. Second, owner-occupied housing can be seen simply as a durable consumption good and housing services as a stream of consumption.

The current income tax system in Finland is a so-called dual income tax system where capital and labour income are divided as different types of income and are taxed with different tax rates. Capital income is taxed with a flat rate, currently at 28 percent, whereas labour income is taxed with a progressive rate. Under the current system, homeowners do not have to pay taxes on imputed rental income and in most cases also capital gains are untaxed. The tax-treatment of landlords differs from homeowners in these respects. Landlords must pay capital income

⁶ See e.g. OECD (1996).

⁷ See e.g. Englund (2003).

⁸ Hills (1991) covers these issues at some length in the U.K. context.

taxes on the net rental income they receive and in most cases landlords are required to pay taxes on the capital gains that are realised when the house is sold. Homeowners and landlords alike do not have to pay taxes on realised capital gains if they or their family have used the house as their home for at least two consecutive years. So in effect, capital gains are taxed for most landlords and are untaxed for most homeowners. If an owner-occupied house is seen as a piece income producing capital and if homeowners are compared to landlords, the tax advantage to homeowners comes from the non-taxation of imputed rents and capital gains. Both have to pay a municipal property tax.

In this framework, even though often highlighted in public debate, the deductibility of mortgage interest is not the fundamental tax subsidy that homeowners receive. In fact, it can be regarded as a tax subsidy only because the corresponding income (imputed rent and capital gains) is untaxed. If imputed rental income and capital gains were taxed, mortgage interest should be seen as an expense from producing taxable income and deductibility should not be regarded as a tax subsidy. The deductibility of mortgage interest can also be seen as a way to extend the fundamental tax advantage to less wealthy households who need mortgage financing to become homeowners.⁹ However, if owner-occupied housing is seen simply as a durable consumption good, the deductibility of mortgage interest clearly constitutes a tax subsidy because in general interest on consumer credit is not tax deductible in Finland. This study concentrates on the former interpretation and treats owner-occupied housing as a capital investment and defines the tax subsidies within the framework of Finnish income tax code.

The tax subsidy resulting from non-taxation of imputed rental income and capital gains can be illustrated simply by comparing the after-tax return a landlord and a homeowner receive from investing in a similar house.¹⁰ Consider a landlord who owns a house with a value of V . Under the current Finnish income tax system, the annual net after-tax return for a landlord can be written as

$$I_L = (1-t) \left(\frac{R}{V} - d - \tau - i \frac{M}{V} + g \right) V, \quad (1)$$

where t is the capital income tax rate, R the gross rent, d includes depreciation, maintenance, operation and other costs incurred from the house, τ is the property tax rate, i the nominal interest rate, M the value of the loan taken for investment purposes and g the capital gain or loss.¹¹ A homeowner, on the other hand, receives the gross rental income in housing services, with a rental value of R , and

⁹ See e.g. Hendershott and White (2000).

¹⁰ For a more general treatment see Englund (2003).

¹¹ Here we assume that the house is actually sold at the end of the year so that capital gains or losses are realised. Under the current Finnish income tax system capital gains are taxed at realisation not when they actually accrue.

is allowed to deduct mortgage interest payments. Thus, the net after-tax return for a homeowner can be written as¹²

$$I_O = \left(\frac{R}{V} - d - \tau - (1-t)i \frac{M}{V} + g \right) V. \quad (2)$$

The difference of the after-tax returns is

$$I_O - I_L = tV \left(\frac{R}{V} - d - \tau \right) + tVg. \quad (3)$$

The first part of equation (3) is the tax subsidy resulting from non-taxation of net imputed rental income and the second term is the tax subsidy resulting from non-taxation of capital gains. Under a tenure neutral tax system, the difference $I_O - I_L$ should be zero. Basically, this can be achieved in three ways: (a) by taxing the imputed rental income and capital gains of homeowners and allowing them to deduct mortgage interest and other expenses from producing this income, (b) by abolishing the tax on landlords' rental income and capital gains, and at the same time eliminating all deductions from landlords and homeowners, or (c) by abolishing the tax on landlords' rental income and capital gains but allowing them to deduct interest expenses accrued from producing rental income. Although the last two would make the tax system tenure neutral, housing would still be tax-favoured compared to other assets. In this study, we examine the case (a) where homeowners are treated the same way as landlords (or other capital investors) under the current tax system. Thus, in the benchmark tax system, imputed rental income is taxed and homeowners are allowed to deduct expenses that are accrued from producing this income, i.e. mortgage interests, maintenance costs etc. Because the current Finnish income tax system is based on nominal income we will also deal with nominal measures.¹³

¹² The assumption that landlords and homeowners face the same maintenance and operating costs is a simplification that may not be correct. For example, Englund (2003) argues that homeowners face lower maintenance and operating costs because home production is untaxed. Furthermore, as illustrated by Henderson and Ioannides (1983) landlords may face higher costs because tenants do not have incentives to take proper care of the dwelling they occupy. This leads to more depreciation or higher maintenance and monitoring costs. On the other hand, Harding et al. (2000) argue that homeowners alike do not have sufficient incentives to take care of their house because future buyers are unable to perfectly monitor the condition of the house. Furthermore, the relative efficiency of landlords and homeowners in producing housing services depends on the structure of the property. Landlords may be more efficient in producing housing services from a multi-unit structure while the opposite is true for single family housing units. See Linneman (1985).

¹³ The tax system considered here is tenure neutral. It is not necessarily optimal. For research on optimal taxation of housing capital, see e.g. Rosen (1985), Englund (2003) and Cremer & Gahvari (1998).

2.2 Deductible items

The Finnish income tax system is based on the notion that net income is taxable, i.e. costs from producing income are fully deductible from gross income. Thus, it is important to be precise on what these deductible items are. There are basically two kinds of homeowners in Finland. First, there are homeowners who own single family detached houses, i.e. they own the property they occupy. Apartment buildings (row houses and multi-storey blocks), on the other hand, are set up as housing companies and the homeowners who occupy the dwellings own shares from the company. The company owns the property and the shares give the owner the right to occupy (or rent out) the dwelling. This distinction is important when considering new tax rules for homeowners because there are currently different deduction rules for landlords who own a property compared to landlords who own housing company shares.¹⁴

Currently, landlords are allowed to deduct the following items from the gross rental income they receive: interest expenses on debt, municipal property tax, maintenance charge, appliance costs, insurance costs, water and electric costs if paid by the landlord, and repair costs that maintain the dwelling. In addition, if a landlord owns the whole property (e.g. a single family detached house) she is eligible for a depreciation allowance from her rental income. The depreciation allowance for landlords is currently 4 percent of the acquisition cost. For example, if a landlord initially paid 100,000 euros for the house, she would be allowed to deduct from gross rental income $0.04 \cdot 100,000 = 4,000$ euros in the first year, $0.04 \cdot 96,000 = 3,840$ in the second year and so on. Of course this means that as the acquisition cost goes down, the future capital gain rises because for tax purposes capital gain is defined as the difference between acquisition cost and the selling price. So in effect, a landlord owning a property is able to defer some tax payments until she sells the property. A landlord owning shares of a housing company, on the other hand, is not eligible for the depreciation allowance. The housing company is allowed to write off the value of the building in its balance sheet but this does not benefit the individual landlord. In a perfectly tenure neutral tax system outlined according current tax-treatment of landlords, homeowners residing in single family detached houses would be eligible for a depreciation allowance similar to the one that landlords are eligible now if they own properties. However, this would create an obscure situation where homeowners are treated differently according to whether they own a property or housing company shares. For this reason we do not allow homeowners to make use of the depreciation allowance.

The above discussion is related to the question of how to account for economic depreciation of housing structures for tax purposes. In principle, this can be done

¹⁴ Also corporations own apartment buildings. However, since this paper is concerned with personal income taxation this aspect is not pursued further.

in two ways. First, one could simply allow homeowners to deduct annual maintenance costs from imputed rental income and any excess depreciation could be handled when capital gains are taxed because the capital gains or losses depend on house quality. Alternatively, one could assume that all houses depreciate roughly at the same rate and simply impute some rate of depreciation on house value. Unfortunately estimates of the depreciation rate of Finnish housing stock do not exist.¹⁵ The household level data set used in the empirical part of this paper includes the repair and maintenance costs stated by the owner. The problem with this measure is that some homeowners choose not to make repairs during a particular year. Instead, homeowners seem to make bigger repairs every now and then. According to our data, in 2004 roughly 41 percent of homeowners reported positive maintenance costs and the average amount that all homeowners spent on maintenance was 0.8 percent of house value. The average for those who did some maintenance was 2.2 percent of house value. In both calculations, house value is estimated by the owner. Although this choice is rather *ad hoc*, we assume that on average a homeowner spends on maintenance 1 percent of house value and allow this amount to be deducted from gross imputed rents for tax purposes. An alternative would be to simply deduct the actual maintenance costs. However, since the main focus of the paper is to study distributional aspects accounting for depreciation through this measure is problematic. The figure of 1 percent is consistent with the findings by Harding et al. (2007) from the U.S. Any depreciation in excess of this could be taken into account when calculating the capital gain or loss once the dwelling is sold. However, we will not deal with capital gains taxation in this paper.

In addition to mortgage interest and depreciation, we allow homeowners to deduct municipal property tax payments, maintenance charge if the homeowner owns the dwelling through a housing company, waste management and insurance costs. In the case of a housing company, the company is liable for the property tax. The tax is passed on to share owners according to the floor area of the dwelling. In practise, the property tax is included in the maintenance charge that the share owners pay to the company. Usually the maintenance charge also includes items such as waste management, maintenance costs of common facilities and so on. These choices follow the current tax treatment of landlords. In addition to these items, some costs such as real estate agent costs should also be deductible. However, since we do not have data on these costs they are left out of the empirical analysis.

¹⁵ In a recent paper, Harding et al. (2007) find that in the absence of maintenance a typical home in the U.S. depreciates at a real annual rate of 3 percent. They also find that a typical homeowner spends on maintenance an amount that adds roughly 1 percent per year to the value of the home. Thus, the depreciation rate net of maintenance is estimated to be roughly 2 percent.

3. Estimating imputed rental income from owner-occupied housing

In order to operationalise equation (3), we need to estimate the rental value, R , of the house a homeowner resides in. There are basically three ways to measure imputed rental income from owner-occupied housing.¹⁶ First, imputed rental income can be calculated as a rate of return on house value which would be received if this equity would be invested in some other investment (e.g. interest bearing account). The researcher would simply need to know the house value and assign some rate of return on it to get an estimate of the imputed rental income. In the second approach, imputed rental income is assumed to equal the market rental value of an analogous good. In the case of housing, gross imputed rental income is assumed to equal gross market rent received by a landlord from a similar dwelling. The reasoning behind this measure is that the rent an owner-occupier could receive by renting out the dwelling can be seen as the opportunity cost of not renting out the dwelling. Because the owner-occupier is not willing to rent out the dwelling she must value the services at least at the amount of market rent. Third, imputed rental income could be estimated using the user-cost of capital approach.

The applicability of the above approaches ultimately depends on the type of data available from housing markets. For purposes of estimating imputed rental income from a given dwelling, one either needs an assessed value for it, or price or rent data from similar dwellings from the same housing market. In the latter cases, an estimate of dwelling value or the value of housing services from the dwelling can be derived using hedonic regression techniques. However, there are clear down-sides to this approach especially for housing units in areas where the number of comparable units is low. In the case where rent data are used the problems may be even more severe because owner-occupied dwellings are often fundamentally different from rental dwellings. For example, single-family detached houses are rarely available for rent in Finland, and thus, a comparable measure for single-family owner-occupied houses is difficult to find. This problem is emphasised in rural regions where comparable rental and owner-occupied units simply do not exist. Because location is one of the most important attributes in house price determination this is by no means a small problem.

Despite the weaknesses mentioned above, this study uses a hedonic rent regression to estimate a monthly rent for owner-occupied dwellings in our data sample. Before we go into the hedonic regression we briefly describe the data. The dataset used in this study is the 2004 household Wealth Survey (WS) produced by Statistics Finland. The WS includes information on various household characteristics such as socio-economic status, demographics, income, taxes, housing and

¹⁶ See Katz (1983) for a more thorough presentation of valuing services of consumer durables.

wealth. Most of the information in the survey data is collected from various administrative registers and the rest collected through interviews. The WS is a stratified sample drawn from all private households in Finland where the strata are created according to socio-economic status and income. In order to get reliable information on overall household wealth, entrepreneurs and high-income households are assigned a higher inclusion probability to the final sample. The selected households are given sampling weights so that the sample is representative of the whole population. In the following calculations sampling weights are used in order to make the results representative of the whole population.

Statistics Finland assigns an estimate of imputed rental income to homeowner households in the WS sample by using information gathered from renter households on their monthly rents through a separate rent survey. Households are stratified according to dwelling characteristics and homeowner households are assigned the average monthly rent of the renter households in the same strata as a measure of monthly gross imputed rent. However, regional aspects are omitted from these estimates altogether, although population density of the municipality is controlled for with two levels, urban and rural.¹⁷ The technique used by Statistics Finland most likely leads to smaller variation in imputed rental income between different regions and households compared to using more accurate imputed rental values.

Often the biggest drawback of using nationwide household level surveys for hedonic analysis is that the precise location of the dwellings is unknown. However, our data allows us to identify the location of a household's dwelling in a more coarse regional setting. First, we can identify Helsinki and the rest of the capital region. Second, we can identify major university cities and other regional centres. Furthermore, Statistics Finland classifies municipalities into three categories according to urbanisation rate as described in footnote 17. A novelty of the 2004 WS data set is that it includes a housing survey supplement where households were asked a number of additional questions concerning their housing choices and needs. For our purposes, the most interesting new information compared to prior household surveys is that household location within an urban area or a municipality can be identified more precisely than before. Namely, the data allows us to identify whether the dwelling is situated in the centre of the city or outside of it.

Using the improved location information and the dwelling characteristics included in the 2004 WS data set, we estimate the imputed rental income of

¹⁷ Statistics Finland defines a municipality as urban if 90 percent of its population resides in an urban area and the largest urban area has at least 15 000 inhabitants. Semi-urban municipalities are those where more than 60 but less than 90 percent of the population resides in an urban area and the largest urban area has at least 4 000 but not over 15000 inhabitants. Finally, rural municipalities are those where less than 60 percent of the population resides in an urban area and the largest urban area has less than 15 000 inhabitants. When a two-level classification is used urban and semi-urban municipalities are labelled as urban.

homeowners using a hedonic regression approach. More precisely, a hedonic rent regression for free market rental dwellings is estimated and the parameter estimates are used to predict the monthly rent for owner-occupied dwellings in the sample.¹⁸ Before we go ahead with the estimation, we present some descriptive statistics on how owner-occupied and rental dwellings differ in order to see what the main concerns are when predicting rental values for owner-occupied homes using rental dwellings. Table 1 presents mean values for dwelling characteristics for different dwelling types in the WS data. From Table 1 it is clear that rental dwellings differ considerably from owner-occupied dwellings. First, they are mostly situated in multi-storey apartment buildings; only about 7.5 percent of rental dwellings are single family detached houses. In addition to differences in dwelling type, the biggest concern for the hedonic model is the fact that single family houses and owned apartments are much larger than rental dwellings in terms of floor area and number of rooms.

Table 1. Descriptive statistics for different dwelling types.

	Owned single family houses	Owned apartments	Free market rental
N	1572	878	292
Floor area (m²)	139.1 (56.7)	81.2 (34.2)	54.6 (27.6)
Number of rooms	4.83 (1.56)	3.18 (1.33)	2.09 (1.13)
Age (years)	25.9 (22.2)	29.1 (20.0)	35.7 (20.0)
Detached, %	93.8 %	1.4 %	7.5 %
Two-family, %	5.7 %	4.1 %	6.5 %
Terraced, %	0.1 %	37.7 %	9.2 %
Multi-storey block, %	0.0 %	56.7 %	74.0 %

Notes: Mean values for dwelling characteristics for different dwelling types. Standard deviations are in parentheses.
Source: Author's calculations from the 2004 Wealth Survey of Statistics Finland

We take this into account in the hedonic model by allowing only for a constant (presumably positive) marginal effect of floor area on gross rent. We make some comparisons and justifications for this choice below. Furthermore, since the purpose of the regression is to obtain out of sample predictions, finding a functional form that fits the rental dwelling data as closely as possible is of secondary importance. Thus, the hedonic regression model takes the following simple linear form

$$R_{ij} = \alpha + \mathbf{x}'_i \boldsymbol{\beta} + \mathbf{z}'_j \boldsymbol{\delta} + \mathbf{y}'_i \boldsymbol{\gamma} + \varepsilon_{ij}, \quad (4)$$

where R_{ij} is the monthly rent of dwelling i in region j , \mathbf{x} is a vector of dwelling characteristics, \mathbf{z} a vector dummy variables indicating the regional housing mar-

¹⁸ This method for estimating the gross imputed rental income is used, for example, in the German Socio-Economic Panel dataset. See Frick and Grabka (2003) for details. Also Eurostat recommends this approach for household surveys.

ket and location, y a vector household characteristics that serve as proxies for neighbourhood quality which is otherwise unavailable to us, and ε is the error term. It's important to emphasise that a household's characteristics do not determine the rent of the dwelling it resides in. They simply serve as proxies for neighbourhood quality.¹⁹ Ideally, one would like to estimate the hedonic model separately for each regional housing market but sample size limitations prevent us from doing so here. Thus, we assume that the (marginal) rents of dwelling characteristics are equal across regional housing markets and allow the housing market specific rents to vary only through the intercept.

The results for the hedonic regressions are presented in Table 2. Even with the drawbacks of the data, the hedonic regression model explains a considerable amount of the variation in rents with an adjusted R^2 measure of 0.61. In the regression we control for major cities²⁰ and other regional centres²¹ and the location (city centre vs. outside) of the dwelling within each area. In addition, we control for smaller urban and semi-urban areas and also distinguish rural areas in four different parts of the country. The coefficients for the dwelling characteristics have the expected signs but because of small sample size the estimates are somewhat imprecise.

The parameter estimates in Table 2 are used to predict a monthly imputed rent for homeowner households. The annual gross imputed rental income for homeowners is obtained by multiplying the predicted monthly rent by the number of months the household has resided in the dwelling during the survey year.²² The net imputed rental income is obtained by making the deductions discussed in the previous section from the gross measures. To obtain the tax subsidy element, the net imputed rental income is then taxed according to a proportional 29 percent capital income tax rate.

¹⁹ See Ioannides and Zapel (2003) and Ioannides (2004) for details.

²⁰ These are Helsinki, Jyväskylä, Kuopio, Oulu, Tampere, and Turku.

²¹ These are Hämeenlinna, Joensuu, Kotka, Lahti, Lappeenranta, Pori and Vaasa.

²² This method produces downward biased estimates of imputed rental income if the household has moved during the survey year from an owner-occupied dwelling to another owner-occupied dwelling or to a rental dwelling. Unfortunately, we are unable to identify these households.

Table 2. Results for the hedonic rent regression.

	Standard			Standard	
	Coeff.	error		Coeff.	error
constant	207.2**	59.65	<i>outside of city centre:</i>		
floor area	2.965**	0.473	Helsinki	249.8**	56.38
age	-4.968**	1.338	other capital region	173.2**	58.00
(age) ²	0.045	0.015	Kuopio	41.33	92.53
detached ^a	-66.18	48.26	Jyväskylä	160.8	94.40
two-family house	-75.77	48.10	Oulu	161.8*	73.59
terraced	-32.98	38.41	Tampere	150.4*	65.81
building material wood	-59.79*	31.49	Turku	128.9 ⁺	72.51
noisy neighborhood	-2.417	31.91	Hämeenlinna	164.5	143.2
small house intensive area	37.46	30.07	Joensuu	98.33	145.3
<i>location dummies:</i> ^b			Kotka	5.220	149.2
<i>city centre:</i>			Lahti	-11.03	93.31
Helsinki	279.0**	57.96	Lappeenranta	no obs.	
Kuopio	113.0	85.35	Pori	86.33	84.55
Jyväskylä	176.5*	84.16	Vaasa	174.8	148.4
Oulu	287.7**	108.65	other urban regions	106.7 ⁺	59.15
Tampere	203.1**	70.60	semi-urban regions	46.40	54.88
Turku	188.4*	75.94	rural west	29.48	80.20
Hämeenlinna	189.4 ⁺	108.18	rural east	12.90	60.08
Joensuu	137.9	93.10	rural north	152.4	88.02
Kotka	no obs.		<i>household characteristics:</i>		
Lahti	141.1	84.83	disposable income	0.003**	0.001
Lappeenranta	163.9 ⁺	93.90	(disposable income) ²	-1.5E-09	1.6E-09
Pori	107.1	84.02	number of children	38.12*	14.95
Vaasa	55.22	84.82	college degree ^d	-6.965	17.32
other urban regions	28.30	40.00			
Number of obs.	292		Adjusted R ²	0.61	
F-test (p-value)	11.37 (0.000)				

Notes: The dependent variable is monthly rent. **, * and ⁺ indicate statistical significance at 1, 5 and 10 percent level, respectively.

^a Dwelling type dummies, reference is multi-storey block

^b Reference is rural regions in southern Finland.

^d Dummy indicating that the household head has a college degree or higher.

In order to get some indication of how well the predicted imputed rents correspond to reality, we compare the predicted rental values to house value estimates made by the owners. These are compared in Figure 1 across house value deciles. Figure 1 also reports predicted imputed rents from a hedonic regression where in addition to variables in Table 2 a square term of floor area was included. In this regression the square term was negative and statistically significant at 1 percent level so that floor area had a diminishing positive effect on rent. Sampling weights are not used in Figure 1. The predicted gross rents follow the house value estimates quite well in the lower part of the house value distribution. However, the estimated average gross rents fall clearly behind average house values in the top half even when floor area does not have a diminishing positive effect on imputed rent. Figure 1 seems to justify the use of the linear specification of

floor area in the hedonic model. However, Figure 1 also suggests a clear problem in using market rents in estimating imputed rents for owner-occupied houses; expensive rental dwellings are rare, and thus, using market rents may not give a very accurate picture of imputed rents for expensive owner-occupied homes.

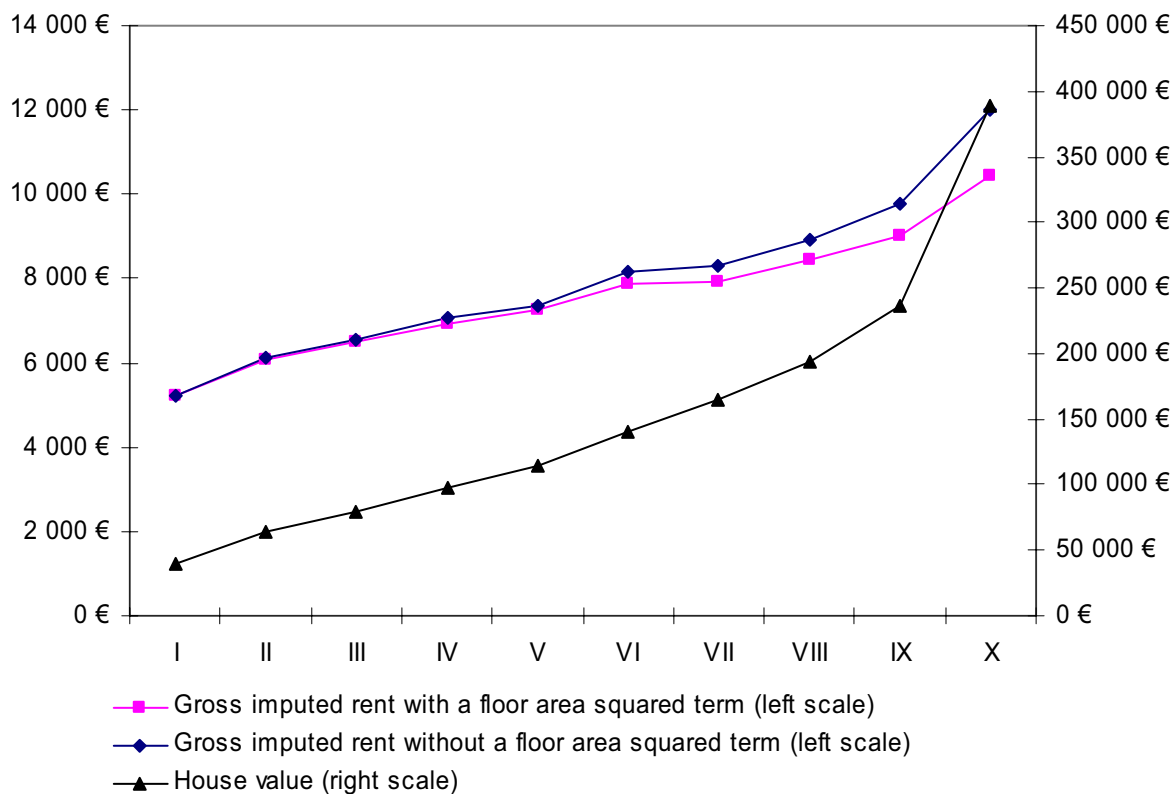


Figure 1. Predicted gross imputed rents and house value estimates according to house value deciles.

4. Distributional analysis

4.1 Overall measures

According to our estimates the overall value of net imputed rental income was about 6.6 billion euros in 2004. This is a little lower than the estimate of 6.7 billion obtained using the approach by Statistics Finland. In Finland imputed rental income makes up about 10.7 percent of homeowner households' and 8.5 percent of all households' total annual disposable income. Imputed rental income is even more important for outright owners with no mortgage debt. For them imputed rental income made up almost 13 percent of total disposable income. The magnitudes of these figures are similar to those reported by Frick and Grabka (2003) for other western countries. They report that imputed rental income makes up about 9 percent of total income in Great Britain, about 7 percent in the U.S., and about 4 percent in former West Germany. The low figure of former West Germany is explained by the low rate of homeownership in Germany compared to these other countries.

The estimated tax revenue forgone in 2004 due to non-taxation of imputed rental income was 1.9 billion euros. This is roughly the same as an official estimate for 2004 reported in the tax expenditure report by Government Institute for Economic Research (2007). To give these figures some perspective, the overall government tax revenue collected through income and wealth taxes in the same year was 12.9 billion euros. On the other hand, housing allowances added up to a total of 900 million euros in 2004 and the amount of tax revenue lost because of the mortgage interest deduction was about 370 million euros. So the non-taxation of imputed rental income is by far the largest individual housing subsidy. However, it must be emphasised that the amounts of the tax subsidies reported here are calculated at given housing tenure, house price and housing consumption levels and as such ignore any behavioural responses.

4.2 Incidence across income deciles

The benchmark income concept used in the distributional analysis is household disposable income. Disposable income includes wages and entrepreneur income, capital income, transfers received and transfers paid (excluding indirect taxes). Estimates of other sources of non-monetary income, such as benefit from a company car, are also included in disposable income. In order to account for differences in household size and composition, and scale benefits in consumption, all income concepts used in the paper are scaled using the so-called modified OECD equivalence scale. The scaling gives the first adult in the household a weight of 1. Remaining adults in the household (defined as household members who are 14

years old or older) get a weight of 0.5 and children (members under the age of 14) get a weight of 0.3.

Because the impact of imputed rental income on income distribution is largely driven by the position of homeowners (especially those who own outright) in the income distribution, we start the distributional analysis by looking at the composition of income deciles according to household's housing tenure and financing choice. Overall in 2004, 66 percent of Finnish households were homeowners and of these 56 percent owned outright. Figure 2 presents the tenure composition of income deciles which are constructed based on equivalence scaled household disposable income including imputed rents.

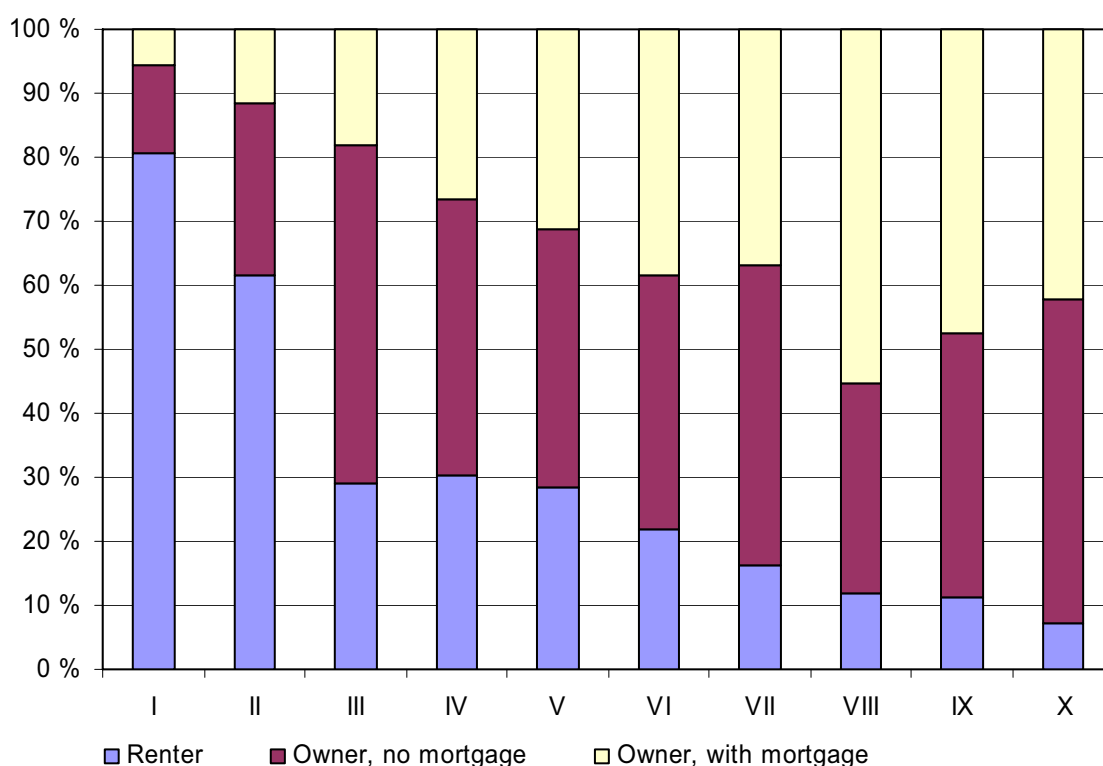


Figure 2. Composition of income deciles according tenure type and financing.

According to Figure 2 homeowner households are situated in the top half of the income distribution. Furthermore, the share of outright owners tends to increase as we move to higher income deciles. However, also some low income households are homeowners. Further calculations show that 60 percent of outright owners in the three lowest income deciles, in fact, are households where the household head was retired. Typically, these households have low current income but may be wealthy with a large part of their wealth invested in housing.

This is illustrated more clearly in Figure 3 where we can see how much net imputed rental income makes up of homeowner households' disposable income in different income deciles (bar on the right). The shares are calculated conditional on homeownership. For homeowners situated in the lowest decile, imputed rental income makes up over 30 percent of their annual disposable income. Clearly, these households would find it difficult to cope with a tax on imputed rental income. Figure 3 also illustrates the way the tax subsidy is spread out across income deciles. Naturally, as the share of homeowners rise with income, also the share of the subsidy that goes to the homeowners rises. However, the homeowners in the top two income deciles receive clearly more than their proportionate share of the subsidy. Especially the highest decile stands out in this respect. Overall, 65 percent of the subsidy goes to the top half of the income distribution.

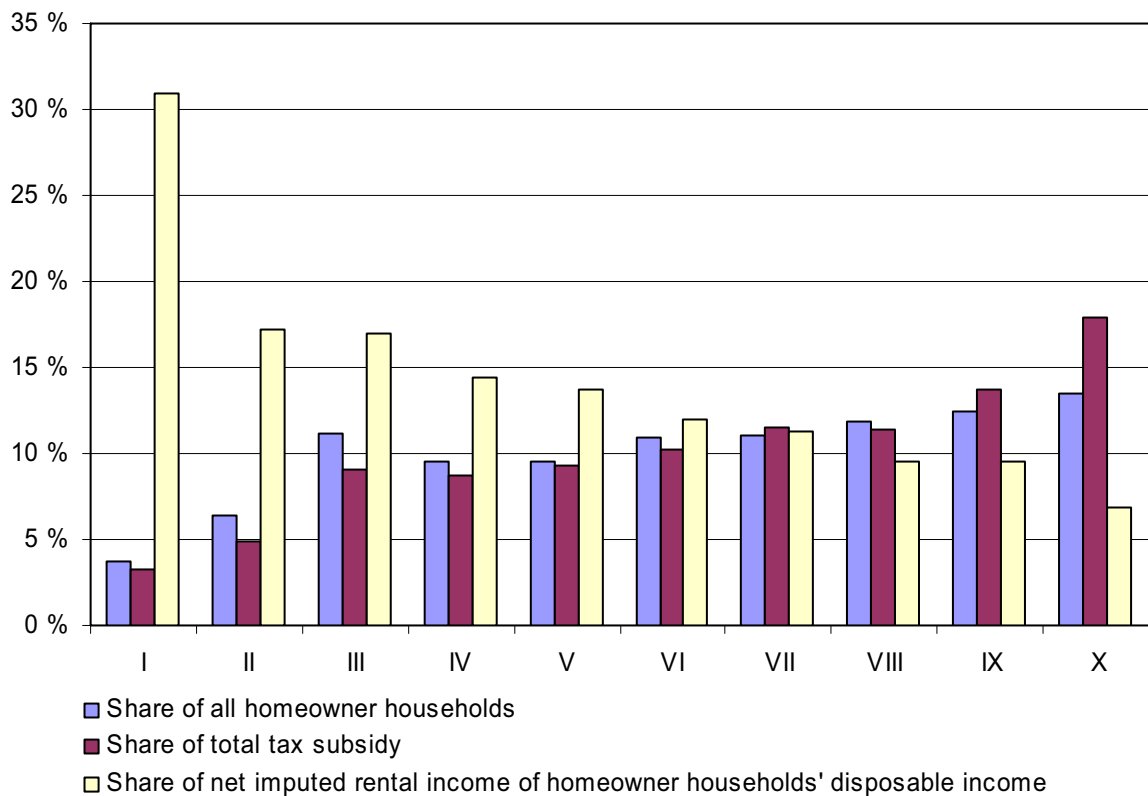


Figure 3. Distribution of homeowners and the tax subsidy according to income deciles.

Figure 4 reports mean values of imputed rental income and the tax subsidy across income deciles. The mean values are calculated conditional on homeownership. Mean values for owner's estimated house value and housing equity (house value minus mortgage debt) are also reported for reference. Homeowners situated in higher income deciles clearly have more expensive houses and also higher hous-

ing equity. Relatively high house values and housing equity in the lower deciles is again probably explained by retired households who own outright and have low current income. On average, homeowners' annual tax subsidy was 1206 euros. Somewhat surprisingly the differences in imputed rental income and the tax subsidy are quite small across income deciles. The information in Figures 2, 3 and 4 indicates that homeowners situated in the top income deciles benefit most from the tax subsidy mainly because they live in expensive houses and are more likely to own outright, which means that they have less deductible interest expenses.

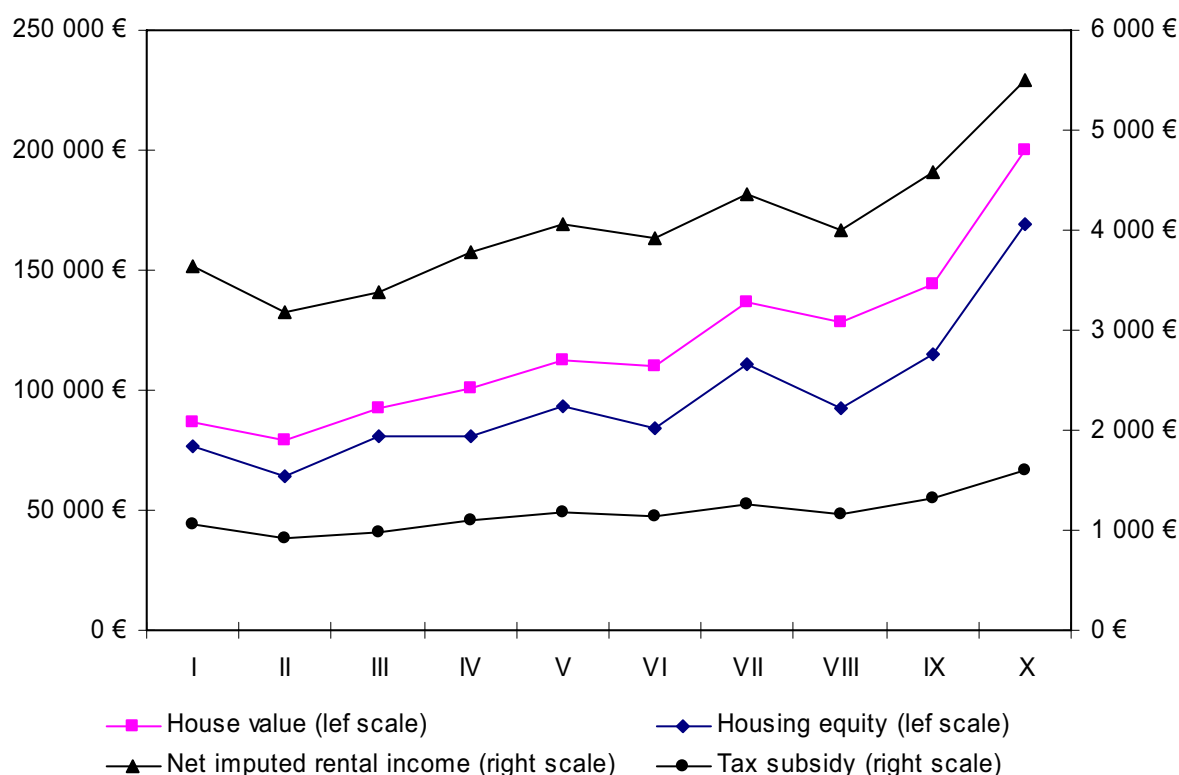


Figure 4. Mean imputed rental income and tax subsidy according to income deciles.

4.3 Impact on overall inequality and re-ranking effects

Next, we turn our attention to the impact of imputed rental income and its taxation on overall inequality. The analysis is based on the following income concepts:

1. Disposable income without imputed rental income
2. Disposable income + net imputed rental income

3. Disposable income + net imputed rental income – a tax on imputed rental income
4. Disposable income + net imputed rental income – a tax on imputed rental income + a tax revenue neutral lump-sum transfer
5. As 4, but tax revenue neutrality is achieved through a lower capital income tax rate.

The idea behind the concepts 4 and 5 is that the increased tax revenue from taxing imputed rental income is transferred back to the households so that overall tax burden in the economy stays constant. In the lump-sum transfer scheme, the increased tax revenue is returned to all adults as an equal size transfer. This of course treats differently households with and without children. However, this way we try to mimic a change in the income tax system, and not confuse this with a change in means tested allowances, such as child allowances. In the capital income tax scheme, imputed rental income is included in the capital income tax base and the capital income tax rate is lowered so that the overall revenue from the capital income tax stays constant. Alternatively, one could lower labour income tax rates. However, Finnish income taxation is based on individual not on household income, and since the data is at household level a lower labour income tax cannot be taken into consideration in this study. The two schemes considered here can be seen as extreme cases and the alternative of cutting labour income taxes would probably be somewhere in the middle depending on how the tax rate cuts are targeted.

Table 3 presents quantile ratios, Gini indices and differences in Gini indices for the five income concepts presented earlier. The measures are calculated using the Distributive Analysis Stata Package (DASP) developed by Araar and Duclos (2007).²³ Table 3 also includes basic distributional statistics for the different income concepts.

²³ Araar Abdelkrim and Jean-Yves Duclos (2007): DASP: Distributive Analysis Stata Package. PEP, CIRPÉE and World Bank, Université Laval.

Table 3. *Income inequality and imputed rental income.*

	1	2	3	4	5
	Disposable income	plus imputed rental income	minus tax on imputed rents	plus lump-sum transfer	lower capital income tax rate
Mean	29 500	32 251	31 319	32 118	32 242
Median	16 344	18 113	17 576	18 112	19 616
P10	8 702	9 476	9 281	9 831	9 613
P90	30 376	32 989	32 173	32 803	37 041
Quantile ratios:					
90/10	3.49	3.48	3.47	3.34	3.85
90/50	1.86	1.82	1.83	1.81	1.89
50/10	1.88	1.91	1.89	1.84	2.04
Gini	28.79	28.04	28.08	27.48	28.88
Differences in Gini					
	1 vs. 2	2 vs. 3	3 vs. 4	2 vs. 4	2 vs. 5
	0.75*	-0.05	0.61*	0.56*	-0.84*

Notes: All income concepts are adjusted by the modified OECD equivalence scale. * indicates that the difference is statistically significant at 5 percent risk level.

Source: Author's calculations from the 2004 Wealth Survey of Statistics Finland.

A positive (negative) difference between the Ginis for different income concepts means that overall inequality decreases (increases) when moving from one income concept to the next. From Table 3 we see that adding imputed rental income to disposable income clearly decreases overall inequality measured by the Gini index.²⁴ This is rather surprising given the fact that homeowners are situated mostly in the top half of the income distribution. However, some low and especially middle-income households also benefit from imputed rental income, and for them the share of imputed rental income of overall income is much larger. The results differ somewhat from the ones found from other countries. For example, Frick and Grabka (2003) find that including imputed rental income to disposable income slightly increases inequality in Great Britain and in the U.S. They do not report statistical significance of their results but the differences are smaller than reported in Table 3. The decrease in inequality in Finland is statistically significant at 5 percent risk level.

Taxing imputed rental income slightly increases inequality (2 vs. 3) but the change is not statistically significant. Perhaps the most interesting comparison in Table 3 is the one where income concept 2 is compared to concepts 4 and 5. These comparisons compare the current tax system (2) to two alternative tax systems where imputed rental income is taxed in a revenue neutral way (4 and 5). Under the lump-sum transfer scheme all adults receive a transfer of 476 euros, whereas the capital income tax scheme allows for a reduction of the capital income tax rate from the then current rate of 29 to 17 percent. That is, under the

²⁴ There were no Lorenz dominating relationships between the income concepts.

latter scheme the tax rate on all capital income including imputed rental income is 17 percent. The results are markedly different depending on the way the accrued tax revenue is transferred back to the households. Compared to the current system, overall inequality is smaller in a system where imputed rental income is taxed with the then current tax rate of 29 percent and the accrued tax revenue is transferred back to the households as lump-sum transfers (2 vs. 4). However, when the accrued tax revenue is used to lower the capital income tax rate on all capital income, inequality clearly increases compared to the current system (2 vs. 5). According to quantile ratios, under the system with a lower capital income tax rate the lowest decile is clearly left back compared to the median and the highest decile. Under the lump-sum scheme, the lowest decile actually moves slightly closer to both the median and the highest decile.

The results indicate that from a distributional point of view it is vital how the new tax revenue is transferred back to the households. This aspect is important also from a political economy point view when considering what type of tax reforms are actually politically feasible under current tenure shares and housing consumption choices.²⁵

In order to look deeper into what is happening to the income distribution a decomposition analysis is performed based on subgroups of households. Here the measure of inequality is the generalised entropy index which can be naturally decomposed to within and between variations among different subgroups. Again the estimations are done using DASP. The population is divided into subgroups based on housing tenure type and age. Housing tenure is divided into three groups; outright owners, owners with a mortgage and renters. The decomposition results are presented in Table 4.

²⁵ See e.g. Eerola and Määttänen (2006).

Table 4. *Decomposition of inequality by tenure type and age, generalised entropy index.*

	1	2	3	4	5
	Disposable income	plus imputed rental income	minus tax on imputed rents	plus lump-sum transfer	lower capital income tax rate
Total population	14.67	13.90	13.93	13.58	14.79
Tenure:					
Owner outright	19.50	15.99	16.74	16.00	17.96
Owner, mortgage	8.81	7.63	7.87	7.60	8.10
Renter	12.33	12.33	12.33	12.48	12.77
Percentage of total:					
Within-group	91.18	84.49	86.75	86.74	85.92
Between-group	8.82	15.51	13.25	13.26	14.08
Age group:					
<25	14.01	14.19	13.81	12.65	14.03
26–35	9.27	9.18	9.13	9.08	9.37
36–45	10.09	9.77	9.76	9.53	10.24
46–55	12.14	11.11	11.19	10.68	11.77
56–65	24.23	21.59	22.13	21.74	24.06
66–75	11.29	10.13	10.24	9.71	11.08
>75	7.17	6.60	6.61	7.98	6.98
Percentage of total:					
Within-group	87.32	86.04	86.38	86.63	86.12
Between-group	12.77	13.96	13.62	13.37	13.88

Notes: All income concepts are adjusted by the modified OECD equivalence scale.
Source: Author's calculations from the 2004 Wealth Survey of Statistics Finland.

The results using the generalised entropy index are very similar to the ones obtained using the Gini index when it comes to inequality in the population as a whole. We consider first the subgroups based on housing tenure. According to the results in Table 4 the degree of inequality is lowest within the group of owners who have a mortgage. This is not surprising because these households are probably in a similar stage of their life-cycle and are at least so well off that they can cope with mortgage payments. On the other hand, income inequality is largest within the group of outright owners. Including imputed rental income to disposable income clearly decreases inequality among both owner types, but the decrease is much larger among owners who own outright. Again this is to be expected because for outright owners imputed rental income makes up a larger fraction of their disposable income. By definition, inequality among renters does not change because they do not receive imputed rental income. However, between-group inequality naturally rises after including imputed rental income.

What happens to inequality in the subgroups under the alternative tax systems? Under the lump-sum transfer scheme, inequality within the two owner groups stays almost constant and is slightly increased among renters compared to the current system. Because there is a clear decrease in inequality at the level of total

population, the results indicate that the decrease in overall inequality is mostly due to a decrease in between-group variation. This can also be seen from the fact that the relative contribution of between-group variation to total inequality clearly decreases. This means that under the lump-sum redistribution scheme renters catch-up to owners, although among renters inequality increases compared to the current system. Under the system with a lower capital income tax rate, inequality rises within each tenure subgroup. However, also here the contribution of between-group variation to total variation decreases. Interestingly, under both alternative tax systems, inequality increases within the renter group.

The lower part of Table 4 includes the results for age group decomposition, where age refers to the age of household head. During the life-cycle income inequality is relatively high among young households (under the age of 25), clearly decreases among the next group (26 to 35), and then follows a hump-shaped age pattern peaking among households whose head is between 56 and 65 years of age. When imputed rents are added to disposable income, inequality decreases among all age groups except among the households whose head was under 25. The alternative tax systems differ also in the way they affect inequality among different age groups. Under the lump-sum transfer scheme, inequality decreases among all groups except among the very oldest. On the other hand, under a lower capital income tax rate, inequality rises across all groups except the youngest. The rise in inequality under this scheme is greatest among the group where household head was between the ages of 56 to 65. Again between-group inequality decreases but the decrease is not as large as it was when the group division was based on tenure.

Finally, we look at re-ranking effects. Table 5 presents transition matrices that illustrate the extent to which households' income rankings change as a result of including imputed rents to disposable income and under the alternative tax systems considered in the paper. The uppermost transition matrix compares the income positions of households with and without imputed rental income. The two lower matrices compare the income positions of the current tax system to the two alternative tax systems. If all the households remain in the same income decile under both income concepts all diagonal elements of the matrices in Table 5 should equal 100 percent.

Table 5. Transition matrices for re-ranking effects.

		Initial income = 1											
		I	II	III	IV	V	VI	VII	VIII	IX	X	All	
Final income = 2	I	82.1	17.9									100	
	II	13.9	50.5	35.9								100	
	III	3.0	22.3	35.8	39.1							100	
	IV		8.6	24.7	32.4	34.2						100	
	V	0.42	0.84	3.0	25.3	38.3	31.8					100	
	VI				3.7	26.1	46.0	24.8				101	
	VII					1.1	20.6	56.8	20.9			99	
	VIII	1.1						1.8	18.1	66.8	12.5	100	
	IX									12.4	79.6	7.8	100
	X										7.8	92.1	100
All		101	100	99	101	100	100	100	100	100	100		

		Initial income = 2										
		I	II	III	IV	V	VI	VII	VIII	IX	X	All
Final income = 4	I	95.4	3.9	0.13	0.06	0.42						100
	II	4.6	88.2	7.0	0.39							100
	III		8.1	79.6	12.2	0.28						100
	IV			13.5	75.7	9.6			1.1			100
	V				11.5	77.4	10.9					100
	VI					12.0	80.9	7.1	0.22			100
	VII						8.8	84.0	7.1			100
	VIII							8.3	87.0	5.0		100
	IX								4.8	92.0	3.1	100
	X									2.8	96.8	100
All		100	100	100	100	100	101	99	100	100	100	

		Initial income = 2										
		I	II	III	IV	V	VI	VII	VIII	IX	X	All
Final income = 5	I	96.4	3.9									100
	II	3.6	93.6	3.1								100
	III		2.7	90.1	6.7							100
	IV			7.0	87.9	5.1						100
	V				5.3	86.8	7.8					100
	VI					7.7	88.0	4.3				100
	VII						4.8	91.3	4.1			100
	VIII							3.8	92.8	3.1		100
	IX								3.3	92.2	5.1	101
	X									4.6	94.9	100
All		100	100	100	100	100	101	99	100	100	100	

The extent of re-ranking due to imputed rental income is surprisingly large. Especially the households in the middle income deciles are extensively re-ranked as clearly less than half of the households remain in their original income decile. On the other hand, most of the shifts from one decile to another are shifts to the very next decile. In every case, about 85 percent of households remain in the same decile or are shifted to the very next, either up or down. Lowest and highest deciles stand out as cases where households mostly remain in their original

income decile. However, nearly 18 percent of the households in the lowest income decile improve their relative income position, which means that imputed rental income is an important item for some low-income households and may be an important factor in poverty reduction.²⁶ Again the flip side to this is that these households would probably find it hard to cope with a tax on imputed rental income.

The re-ranking caused by moving from the current tax system to a system where imputed rental income is taxed can be seen from the two lower matrices in Table 5. More re-ranking takes place when moving to the lump-sum transfer scheme than to the capital income tax scheme. This is to be expected because a lower capital income tax rate affects fewer households than the lump-sum transfer scheme. More precisely, low-income renters clearly benefit from the lump-sum transfer scheme whereas they rarely have capital income, and thus, do not benefit from a lower capital income tax rate. In fact, most renter households are probably totally unaffected by a reform where imputed rental income is taxed and the tax revenue is used to lower the capital income tax rate. On the other hand, some low-income homeowners are made clearly relatively worse off under both alternative tax schemes.

Since the results presented here ignore behavioural responses by households to the proposed reforms some discussion on the likely behavioural effects is in order. In a tenure neutral tax system, households would have a smaller incentive to choose owning versus renting. Furthermore, when imputed rental income is taxed those households who would choose to own would probably want to own smaller houses. This would probably lower house prices at least in the short run. However, this effect is mitigated by an increase in the demand for rental housing because households have to consume housing services in any case. Since taxing imputed rental income would lower other taxes, the decline in housing demand would also be counteracted by a positive income effect due to the fact that housing is a normal good. The exact effect of a tax reform on overall housing demand vitally depends on the way other taxes are changed when the new tax is introduced. There are also reasons why some households would be reluctant to switch from owning to renting. Perhaps the most obvious reason is that single family detached houses are rarely up for rent. Households with a strong preference for this type of housing would probably continue to own or pursue homeownership even under a tenure neutral tax system.

²⁶ Frick and Grabka (2003) find that imputed rental income yields clear reductions in poverty especially for older households in Great Britain, former West Germany and the U.S.

5. Conclusions

This study analysed the effects of imputed rental income from owner-occupied housing and its taxation on income distribution in Finland. The results indicate that owner-occupied housing has a significant impact on the well-being of many households. In 2004 imputed rental income constituted on average about 10.7 percent of homeowner households' disposable income. Furthermore, including imputed rental income to household disposable income clearly decreased overall inequality measured by the Gini index. We also found that the government loses significant amounts of tax revenue because of non-taxation of imputed rental income. The estimated tax revenue forgone in 2004 was 1.9 billion euros which amounts to almost 15 percent of the total government income and wealth tax revenue collected that year. Furthermore, the tax subsidy resulting from non-taxation of imputed rental income is skewed toward high-income households who are more likely to be homeowners and also more likely to own outright. More than 65 percent of the total tax subsidy went to the top half of the income distribution. However, we also find that some low-income, mostly retired homeowner households would find it difficult to cope with a new tax on imputed rental income.

The paper also compared the current tax system where imputed rental income is untaxed to two alternative tenure neutral tax systems where imputed rental income is taxed. In both systems, the increased government tax revenue was returned to the households so that the overall amount of government tax revenue stayed constant. In the first scheme, the increased tax revenue was returned to all adult individuals as equal size lump-sum transfers, and in the second scheme, the capital income tax rate was lowered so that the total tax revenue from capital income taxes stayed constant. Due to the nature of the data used we were unable to experiment with different tax rate cuts in labour income taxes which would probably be the most realistic alternative compared to the ones considered here.

We find that the effects to overall inequality depend vitally on the way the increased tax revenue is transferred back to the households. Under the lump-sum transfer scheme income inequality decreased slightly compared to the current system, whereas under the lowered capital income tax scheme inequality clearly increased. These, of course, are short run results that ignore any behavioural responses from the households. On the other hand, Gervais (2002) finds that even in the long run distributional effects of taxing imputed rents may be small. Assuming that the efficiency gains from a tax on imputed rental income are compelling this can be seen as an encouraging result. However, as was shown by Eerola and Määttänen (2006) homeowner households may be reluctant to vote for a reform that aims to tax imputed rental income because the efficiency gains of the reform materialise only in the long run and negative short run effects overweigh the positive ones in current homeowners' decisions.

These results indicate that any attempt to introduce a tax on imputed rental income should be accompanied by a package of tax cuts that mitigate welfare losses to current homeowners, and thus, could be sold to the voters. For example, our results suggest that using the tax revenue to lower the capital income tax rate would probably not be a very popular policy option in a country like Finland where income equality and social cohesion are highly regarded. One option that may prove to be politically feasible is to cut labour income tax rates so that the overall progression in the tax system stays more or less constant. To know the exact way to do this would require individual level tax register data and a sophisticated microsimulation model. This could be a fruitful avenue for future research. In addition, this type of reform could be accompanied by a transition period where the effective tax rate on imputed rental income is raised gradually. However, the purpose of this discussion is not to endorse any particular reform, but instead, to highlight the importance of the way the increased tax revenue is redistributed.

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