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Does housing allowance feed through into rental prices?

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Abstract

This paper deals with the incidence of housing subsidies, which is analysed using Finnish panel data. The main data set comprises 50 000 households that received housing allowances during the period 2000–2008. In addition, we utilize repeated cross-sections of all Finnish households for 1989–2008, the annual sample exceeding 10 000. Estimation results suggest that a part of the subsidies will indeed feed through into rental prices. A conservative estimate of the size of the feed-through is one-third, but it is certainly possible that the number is, in reality, as high as 50 per cent. On the other hand, the subsidy seems to have increased housing demand more than the subsidy-induced income effect would have implied, which is in accordance with the goals of the subsidy programme. Our results seem to be consistent with other studies, which have also indicated relatively high rent effects. If this is indeed the case, we are advised to reconsider the need for reforming the system of housing subsidies, at least with regard to the share of costs that remains on households' own accounts and the implicit indexation of the system.

Keywords: housing market, income transfers, incidence, housing allowance

JEL classification numbers: H22, I38, R28

Siirtyykö asumistuki vuokriin?

Suomen Pankin keskustelualoitteita 11/2011

Matti Virén
Rahapolitiikka- ja tutkimusosasto

Tiivistelmä

Tässä keskustelualoitteessa analysoidaan asumistuen kohtaantoa suomalaisen paneeliaineiston avulla. Tilastoaineisto käsittää 50 000 kotitaloutta, jotka saivat asumistukea ajanjaksona 2000−2008. Tämän lisäksi ajanjaksolta 1989−2009 käytetään suomalaisista kotitalouksista koostuvia peräkkäisiä poikkileikkausaineistoja, joissa kussakin kotitalouksien määrä ylittää 10 000. Estimointitulokset viittaavat siihen, että osa asumistuesta siirtyy vuokriin. Varovainen arvio siirtymän suuruudesta on yksi kolmannes, mutta luku voi olla niinkin suuri kuin 50 %. Toisaalta näyttää siltä, että asumistuki on lisännyt asuntojen kysyntää enemmän kuin asumistuen välitön tulovaikutus olisi tehnyt, mikä on sopusoinnussa järjestelmän tavoitteiden kanssa. Tulokset ovat linjassa muihin tutkimuksiin, jotka myös ovat päätyneet verraten huomattaviin vuokravaikutuksiin. Jos vaikutukset todellakin ovat näin suuria, on paikallaan uudelleenarvioida asumisen subventiojärjestelmää ainakin siltä osin kuin kyse on kotitalouksien omavastuista ja tukijärjestelmän implisiittisestä indeksoinnista.

Avainsanat: asuntomarkkinat, tulonsiirrot, tulonsiirtojen kohtaanto, asumistuki

JEL-luokittelu: H22, I38, R28

Contents

1. Introduction

This paper deals with the incidence problem of government income transfers. The issue of incidence is of wide concern in taxation but obviously it is also relevant for government transfers and subsidies. This becomes apparent when one tries to answer the question of who will ultimately pay the tax or receive the transfer. The idea is that the burden of taxes (likewise, the benefits of transfers and subsidies) may be shifted from the original agent to a market counterpart even though the original agent has the legal obligation to pay the tax (or receive the subsidy) and handle the payment or the receipt. The matter becomes complicated when we consider it in a general equilibrium setting, as is illustrated in Figure 1. The housing allowance affects not only income of the poor but also the income of the landlords, rents, tax rates, labour supply, housing production and so on. Because the pros and cons of housing allowance are so complicated, the housing allowance also represents a typical *public choice* problem where voter distributions across income and tenure choices as well as the existence of special interest groups affect the design of the system. Here, however, we bypass these issues and focus mainly on the incidence question.

Housing allowances, alike all other subsidies and taxes, create deadweight losses. The size of loss depends, in the perfect competition, on the supply and demand elasticities of the respective aggregate supply and demand curves. In the case of monopoly, things are more complicated; even over-shifting of incidence may occur so that prediction of deadweight losses is less straightforward (see Musgrave 1959)[1].

There have been numerous analyses of tax effects but with relatively few dealing with income transfers and subsidies. The reason is that national systems are very different, and institutions play a more important role (cf. e.g. the MISSOC Data base of European Union, which gives an overview of national social security systems and Ditch et al (2001) for comparisons of housing allowance systems). In taxation, we typically have a representative tax parameter but as regards transfers systems, such as housing allowance, we have much more complicated rules and parameterizations. Moreover, transfers are typically distributed only to a subset of people or households, not to mention means tested systems where rules cannot be clearly specified. Still, the size of transfer programs is so large and potential consequences so important that a study of incidence is clearly motivated.

The housing allowance is the main means of supporting housing in Finland. It constitutes direct income support to households and is distributed by the Central government, specifically by the National Pension Fund (KELA).[2] The support goes mainly to households living in

[1] In Finland, relatively few studies of (tax) incidence have been carried out. See, however, Viren 2009 for VAT changes and Korkeamäki and Uusitalo (2006) for employers' social security expenses.

[2] International comparisons of housing allowance can be found from OECD and the IFO/DICE database. See http://stats.oecd.org/Index.aspx?DataSetCode=FIXINCLSA and http://www.cesifo-group.de/portal/page/portal/DICE_Content/SOCIAL_POLICY/Basic_Protection/SP060_GUARANTEEING_SUFFICIENT_RESSOURCES/cash-hous-ben05.pdf.

rental housing although a small fraction goes to households living in their own houses. The allowance system is divided into three major categories: general allowance (which we study here), allowance for pensioners and allowance for students. Total expenditures in 2008 were somewhat over EUR 1 billion (roughly 0.5 per cent of GDP). About 16 per cent of households and 12 per cent of individuals receive a housing allowance. In two decades, the number of recipients of different forms of housing allowance has increased by 40 per cent.[3] To give some perspective to these numbers, we would mention that roughly one-third of households in Finland live in rental housing. The housing allowance is also related to social assistance , which is distributed according to the housing allowance rules. Within social assistance, all housing expenditures (which qualify under these rules) are paid to poor households that have no or very little income.

The effects of housing allowances are analyzed only in a few studies, probably due to complexity of the allowance systems and lack of suitable data. A useful survey is provided by Rosen (1985). Evidence from more recent policy experiments is provided by Gibbons and Manning (2003) using UK data. Gibbons and Manning arrive at the result that as much as 50 % of the allowance is shifted to rental prices. An even higher estimate is obtained by Fack (2006) who found the representative number for the French housing allowance reform was as high as 78 %. In the United States, Susin (2002) estimated the rental price effect of housing vouchers at about 16 per cent. In Finland, there have been two studies by Kangasharju (2003 and 2010) which have produced two quite different results. The first one arrived at an estimate of 15 per cent whereas the latter got a much higher value (60-70 per cent). Both studies used single changes in the allowance parameters in the *differences in differences* framework, where receivers of housing allowances were controlled.[4] Finally a study and Hiekka and Viren (200) ought to be mentioned. Basically, it used similar data as in the current study, but the sample was limited to 1000 households in the Turku city area. This study arrived at the tentative result that one-fourth of housing allowance is shifted to rental prices.

This study uses panel data on Finnish households that have received housing allowances (sometimes) during the period 2000-2008. Altogether 50 000 households are included in the data. Essentially, nine major changes in the housing allowance are considered for the period, but because different households have different possibilities of obtaining housing allowance (due to income, location and so on) we have also get quite a bit cross-section heterogeneity in statutory housing allowance levels, which altogether generate much more variability in both the rents and (exogenous) housing allowances. Because these data include only households that received housing allowance we also used another data, the Finnish Income Distribution survey (FIDD), which covers the period 1989-2008. These data basically represent repeated cross-sections, although half of the annual sample is rolled over to the next year's survey, so that the data also have some panel features. These data were used mainly in testing the "law of one price" in the rental housing market. Thus the question is whether the recipients of

[3] The Finnish housing allowance follows the rule: allowance=0.8*(min(max_expenses, rent) – base deduction), where base deduction depends on income and household characteristics. For instance, for a of single person household base deduction is 0, when 0 < income < 541, base deduction = 298 when income is 1245 and when income exceeds 1245, no allowance is granted. The maximum allowance (max_expenses) depends on the regulated norm space and rent levels. The latter depends on the location of the municipality and the age of the house. On top of that, the allowance system is in practice indexed to the past the year's change rate of market rental prices and typically full compensation is provided (cf. fn 13 for the consequences of this indexation). Illustration of the size of the allowance is presented in Table 1 in Appendix.

[4] The properties of the differences in differences (DD) approach are surveyed in e.g. Bertrand, Duflo and Mullainathan (2004).

housing allowance pay higher/lower rents. In addition, the data facilitate estimation of the demand for rental housing.

2. Background for empirical analyses

We us start with the basic assumptions on the nature of rental contracts and rents. We start with the assumption that rental housing can be measured by a simple index of volume Q and price P. In practice, this is of course all but trivial because quality considerations (age of house/apartment, location, neighbours, size of flat and so on) are of prime importance. Hence construction of indexes is difficult – essentially, we are dealing with *hedonic* prices and quantities. In practice, we to take the quality consideration into account by using proper control variables in the empirical analysis. This is done in part via fixed effects in the panel setting (most quality attributes do not change very much over time) and partly by including the most importance controls (like age of house or location) in the estimating specification.

In addition to the measurement problem, we face another difficult conceptual problem in dealing with the information set and the price setting system. It is obvious that market participants know (at least in the certainty equivalence sense the expected values of) prices, rents and incomes. But it is questionable to assume that landlords know the details of the possible tenants' income and wealth. Hence rental housing markets are probably not characterized by full scale price discrimination.

This is due partly to the price setting rules of the system. At least in the Finnish system, most rental housing business is done by rental housing agencies. These typically post fixed prices that are set by the landlord – perhaps with the advice of the agency. The main point is that there is very seldom any bargaining between prospective tenant and landlord. The agency selects the tenant from the group of qualified set of rental housing seekers. Obviously, the posted rent is such that the landlord assumes that at least one tenant (who is able and willing to pay the rent) will accept the offer.

Looking at the housing allowance, our considerations mean that landlords take into account of the fact that housing allowances will increase tenants' ability (and willingness) to pay higher rents but we would not assume that landlords would specifically demand higher rents from tenants who are eligible for housing allowance. This assumption is important from the point of view of event study analysis. If we measure the impact of the housing allowance via the behaviour of rents for households that do receive housing allowances and those that do not, we must assume that the two groups can be distinguished in the rental market. Obviously, to some extent this can be done because the two groups have different incentives to oppose high(er) rents. Even more evident this revealing is in the case of households that receive social assistance. As pointed out above, municipalities pay in full the rents of such households. Obviously these people have no incentive to oppose high(er) rents.

Even with no price discrimination, the housing allowance would affect the rental price offers because landlords know the details of the system and can form expectations of the relative income of households that are eligible to housing allowance. If, for instance, the landlords

know that half of the households can get a housing allowance up to the upper limit of, say, 500 euros, that surely would affect the distribution of offer(s)[5].

To derive the equilibrium rent, we use a simple supply and demand model and solve model for prices. As for demand, we assume that it takes the following from:

$$Q = D(Y/P, A/P, N, R_H/P), \quad (1)$$

where Q denotes the demand for rental housing services (keeping in mid the composite index nature of Q), Y income (excluding housing allowance), A housing allowance, N the size of the household, R_H the rental price level and P the general price level. The supply of rental housing is, in turn, determined by the following function:

$$Q = S(R_H/MC), \quad (2)$$

where MC denotes the relevant marginal cost of rental housing.

To measure these costs we employ the user cost of housing which is constructed in usual way from interest rates, house prices, depreciation and taxes as can be seen below. By setting (1) and (2) equal, we can solve the system in terms of R_H, which takes the following form:

$$R_H = R_H(Y/P, A/P, N, MC/P). \quad (3)$$

In practice, this is estimated in a (log) linearized from. The coefficients obviously reflect the demand and supply elasticities, which determine the incidence values in a way explained by e.g. Susin (2002). Needless to say, if supply is perfectly inelastic and demand perfectly elastic, the housing allowance is shifted completely to rents (and thus goes to landlords). By contrast, if the supply side functions well in the sense of being highly price elastic (and competitive, of course) the housing allowance would just increase tenants' income and show up as increased demand for housing. On the basis of demand analysis, we know that the price elasticity of (rental) housing is relatively low and the same must be true for the price elasticity of supply – the latter might even be close to zero in the short run. Intuitively, one might therefore expect some a roughly 50 – 50 outcome, although the only way to find out is to estimate (3) and scrutinize the parameter values of the exogenous component of the housing allowance.

In what follows, equation (3) is estimated in the form:

$$(R_H/P)_{it} = a_{0i} + a_1(MC/P)_{it} + a_2 N_{it} + a_3 Space_{it} + a_4 Age_{it} + a_5(Y/P)_{it} + a_6 Max_{it} + u_{it}, \quad (4)$$

where R_H denotes the rental price level, P the (Consumer Price Index) CPI, N size of household (number of people), *Space* size of flat, *Age* age of the flat, Y income (ex housing allowance) and *Max* to the maximum achievable housing allowance. u_{it} is the random term, where i denotes the i:th household and t the period (year). As pointed out above, the real marginal cost (MC/P) is measured by the real user cost *uc*, defined as:

$$uc = P_H/P(r + \delta - \pi_H)/(1-\tau), \quad (5)$$

[5] How exactly the rents are determined could be analysed in a search-theoretic set up (see e.g. Loikkanen (1982) for a good exposition of this kind of model in housing markets). Here we are not so much interested in all the details of rental housing market and make use of much simpler supply and demand framework.

where P_H denotes house prices, r nominal interest rate (for housing loans) δ the rate of depreciation and maintenance costs (set here at 7 per cent), π_H the change in house prices and τ the capital income tax rate which varied between 26 and 29 per cent in Finland during the sample period.[6]

The model is estimated using the fixed effects model as the basic specification although we scrutinize all versions of fixed effects models, no fixed effects, cross-section fixed effects, and both cross-section and time fixed effects).

The essential feature in the analysis is that the key variable *Ma*x does not depend on the actual rent level because it is set by the government and neither the tenant nor the landlord can affect it. Hence, in this respect it can be considered exogenous. But we must keep in mind that it measures the potential maximum achievable allowance that can be received for the flat in question (given the age and the location of the flat). Obviously, the choice of particular flat or the flat type (in addition to the tenure choice itself) is endogenous, which makes the exogeneity assumption somewhat delicate. Of course, we can test this assumption in the empirical analysis.[7]Obviously there is some simultaneity between rents, allowances and house prices as well, due to capitalization of rents. For the time being, we ignore this problem.

Before we turn to estimation results some comments on data are in order, especially because the data sets are to some extent unique. There are a huge number of observations and the main variables are measured fairly accurately.

The main data source is the Finnish National Pension Fund (FNPF) which distributes the housing allowance. The data sample that the FNPF has kindly provided to us is based on register data, which are based on housing allowance applications, which turn are based on actual lease agreement contracts. Thus, the data are fairly accurate compared e.g. to various survey measures. The FNPF data cover 9 years (2000-2008) and include 50 000 households from 345 municipalities. Most of them come from the biggest cities, thus about one-half come from the Helsinki metropolitan area. Potentially, the number of observations is 450 000, but in practice it is much less because the there are no data for periods in which the housing allowance was not paid. The effective number of observations (after taking account of all missing observations) is therefore ”only” 140 000. Although the data are good there is one problem: the data include only households that received a housing allowance. Thus, we have no proper control group. In many cases the same households have received a housing allowance throughout the sample period so that for a large fraction of the data we cannot distinguish ”new” rental price level and ”existing rental price levels”. Fortunately the data are still sufficient to enable comparison of new and existing (old) contracts.

The annual sample of the Finnish Income Distribution survey (FIDD) is somewhat smaller (the most recent number of observations is only about 26 500, consisting of 10 500 households) although the number of variables is much larger (760) because the data include all pos-

[6] For calibration of numbers, see e.g. Verbrugge (2009). Verbrugge finds large differences between observed rents and user costs in US data. Also the Finnish data suggest that, at least, for the short run, these series diverge a lot (Figure 4). Median values of user cost and rent yield (rent/house price) are almost equal for 2000-2008 (4.4 and 4.3 per cent respectively) but the mean values differ considerably (μ_{uc} = 6.2 and μ_{rH} = 4.5). The most striking feature is the large standard deviation of user costs (which reflect very unequal regional developments in house prices). σ_{uc} = 3.8 and σ_{rH}= 1.4).

[7] The results of Lyytikäinen (2006) suggest that these simultaneity problems are not particularly severe in the Finnish data).

sible variables for income, taxation, income transfers and related items. The data are partly register-based, which gives some guarantee of the quality of the income and expenditure numbers. We have used all cross-sections that cover the period 1989-2008, so that the total number of observations (at the household level) is well above 200 000. The data are partly in panel form, so that half of the respondents in each survey also participated in the next year's survey. Although we used all the data, we report detailed results only for the most recent (2008) cross section and two panel data sets, for 2001-2002 and 2005-2006. The cross-section data are used primarily to see whether it makes any difference if we focus on households that receive a housing allowance or on households that do not receive a housing allowance. Thus, essentially we try to test " the law of one price" in the Finnish rental markets. In addition, we use these data to revisit the demand equation for rental housing.

Some idea of the Finnish system can be obtained from the enclosed graphs. Figure 2 illustrates the mean values of rents and the Max variable and Figure 3 illustrates the relationship between rental prices and the house prices (in a sense, the gross housing rental yield). As one can see, house prices have increased more than rents, even though the rental yield is still reasonably high. Figure 4, which represents aggregate price indexes, suggests however that the slowdown of the rents/house prices ratio is not extraordinary but rather a typical phase of the long-run relationship between these variables. In fact, co-integration tests indicate that these variables are co-integrated and, moreover, that the speeds of adjustment are relatively slow (see also fn 14 for Granger causality tests).

Figure 5 compares the (after-tax) user cost and rental yield. It clearly shows that rents are relatively stable but the user cost is much more volatile, mainly reflecting changes in house prices (peaks in the user cost graph correspond to episodes in which house prices temporarily decreased in 2001 and 2008). In Finland, there are some "bubble" –features in house prices although the changes have not been record high in Europe.

Finally, Figure 6 gives some idea of the persistence of rental prices (showing the annual frequency of changes in rents). Quite clearly, a considerable proportion of rents do not change every year. The rents that have been lowered are also in most cases "constant rents": reductions are usually very small (something like rounding errors). Thus, one could say that roughly one third of rents are not changed annually. This is rather high compared with changes in consumer prices (cf, e.g. Bils and Klenow (2004)). So rents are relatively persistent which should be kept in mind when we evaluate event study type estimates of the impact of housing allowance on rents. If rents move slowly, we should have a larger window for potential lagged effects of housing allowance and not focus merely on the immediate reaction. This would obviously complicate the analysis

3. Interpretation of results

The estimation results are presented in Tables 1- 4. Table 1 deals with the rental price level equation (4) which is estimated from the Finnish panel data. Using the same data, we also have estimated a demand equation for rental housing (Table 2). In addition, we estimated rent and rental housing demand equations from the 2008 cross-section data of the Finnish income distribution survey (Table 3). The same data are used to scrutinize the effects of 2002 and 2005 changes in housing allowance and social assistance systems (Table 4).

The demand equation is a simple double log model of the following form:

$$Space_{it} = b_{0i} + b_1(P_H/P)_{it} + b_2 N_{i\,t} + b_3(A/P)_{i\,t} + b_4 Age_{i\,t} + b_5(Y/p)_{\,it} + b_6 Space_{it-1} + u_{it}, \quad (6)$$

where *Space* denotes the quantity of housing, measured by the apartment space while *A* denotes the housing allowance.

As for the results in Table 1, we see that they are relatively robust in terms of the panel data estimation procedure and variable transformations (level vs. log). Similarly, use of the Least Absolute Deviations (LAD) estimator makes no difference. The estimates of the shift parameter are all highly significant. Their values differ somewhat depending on whether we analyse rental prices or rents, or whether we use log or level form model. In any case, we can conclude that if the (maximum) housing allowance is increased by 100 euros, rents will increase something like 33 euros. Part of this change might of course be a change in the size of the apartment. Thus, when we focus on the price variable (rent per square meter) we find that the shift factor is much larger, especially in new rent contracts. Thus, if the maximun rent per square meter is increased by one euro, market rental prices will increase by at least half of that. In elasticity terms, the change is smaller - perhaps one fourth. All in all, it may be safe to say that at least one-third of the housing allowance shifts to rental prices, so that the incidence problem is by no means marginal.

Otherwise we may conclude that rents increase along with the price of houses and household income. By contrast, the age of a house has a negative impact. Real rents also decrease, ceteris paribus, if the tenant remains in the same flat for longer time. Those who have lived in the same flat for decades seem to get an additional bonus (see the row for "old tenant"). Although most rental contracts are for relatively short periods there also very long spells of living in the same apartment (see Figure A1 in Appendix for details). More than one-quarter of households have remained in the same rental apartment for more than 10 years; some have even stayed for 45 years).[8] The fact that rents for those households that change the apartments are somewhat more sensitive to the level of the housing allowance (cf. equation 7 in Table 1) may indeed be interpreted such that the housing allowance is at least partly capitalized in the first rental contract.

The role of household size remains somewhat ambiguous. Thus, the coefficient of the size of household typically has a negative sign but the sign for number of children is clearly positive. Thus, families with children and single households seem, ceteris paribus, to pay higher rents and old couples lower rents (this also comes out of the FIDD data, in Table 3). Probably the ambiguity is due to the fact that the *Max* variable already includes the impact of household size (a bigger family automatically receives a bigger household allowance). By including the household size variable in the estimating equation we render the interpretation of the coefficient of the *Max* variable more transparent. Now it is interpreted as the impact of housing allowance policy *conditional on the size of household*. Finally we note that regional differences matter a great deal, although we do not report the coefficients of the municipality and regional dummies. We only report the coefficient of the Helsinki dummy because it quite import for e.g. " the age of the house variable". In the city of Helsinki many apartments are very old but yet their rental prices are well above the national average.

[8] Because we measure the length of stay at the end of 2008 (when most contracts continue), the numbers are downward biased.

Although the *Max* variable is basically exogenous we estimated the equations also by the Instrument Variable (IV) estimator. Qualitatively, the results were unchanged. It is only that the coefficient of *Max* variable did tend to increase somewhat when the IV estimator was used. In the panel we quite systematically used cross-section fixed effects to control for the (presumably) constant quality factors. The use of fixed effects is not completely innocent because the fixed effect account for most of the cross-section variability and thus the explanatory variables only accounts for time-series variability in rental prices. Quite clearly, at least the coefficient of *Max* variable increases if we use only regional and municipality dummies, which suggests that the results for cross-section fixed effects provide a kind of lower bound for the coefficient of this variable (and hence for size of the shift effect).

The demand curve (5) estimates in Table 2 are also easy to interpret: higher income increase demand and a higher price lowers it. In the same way, larger household size has a positive effect. The role of housing allowance seems clear: it has a positive effect on size of flat and the effect seems to be larger than the effect of wage (other) income. This could, of course, reflect simultaneity between size of apartment and the housing allowance but even though we simply use an allowance dummy or lagged allowance (equation 7 in Table 2) we get (ceteris paribus) a positive effect. Moreover, there is some evidence that the allowance effect is stronger with lower rents.[9]

We also scrutinize the demand behaviour using the Income Distribution Database cross-section data. As pointed out earlier, these data allow us to test the importance of housing allowance in the case where only some of the households receive housing allowance.
Quite clearly, rents are related to housing allowance, the coefficient of this variable is much higher than the coefficients of wage income and other income transfers. The result is in fact well in accordance with the basic aim of the housing allowance, that is, an improvement in the housing conditions of the poor. The role of other (control) variables is something one might expect: rents per m^2 are lower in bigger flats, and rents in the Helsinki Metropolitan area (*Metropol*) are clearly higher than in the rest of the country (including more detailed area dummies did not add anything important to the results). The data allow for including a much larger set of controls in the basic equation, but if we do so the general flavour of the results does not change (cf. footnote to Table 3).

The cross-section data quite clearly suggest that the law of one price holds in the sense that rents (per square meters) for housing allowance receivers and non-receivers are the same. Thus, the housing allowance dummy is not significant in the basic regression (Table 3, equation 2). This result is indeed made obvious by scrutinizing Figure 9, which illustrates the distribution of rents for all tenants and for those who a receive housing allowance. Thus, the median rents are almost equal.

The 2008 result does hold for most of the cross-sections (see Figure A2 in Appendix). Thus, the coefficient of the housing allowance dummy is significant only for the early 1990s. Along with the growth of the number of recipients of the housing allowance the discriminatory effect of the housing allowance has disappeared. The rents are the same for both recipients and non-recipients of housing allowance. Towards the end of the sample period (more precisely, in the first year of the financial crisis, 2008) the housing allowance indicator again becomes large (but not significant) indicating that the housing allowance has somehow shown up in behavior in the rental housing market.

[9] Thus, if one uses quantile regression, the estimate of the allowance variable with the 9th quantile is .090 and with the 1st quantile .432.

It is not clear why recipients of housing allowance have sometimes paid higher rents than the other households. The result does not seem to depend on the type of landlord (private persons of firms, the employer, municipality, or non-profit organisations) because the estimates are very similar for these subsets of data. In a system where rent levels are set by the landlord prior to the offer or where the landlord can basically alone determine the rental price of existing tenant housing, the allowance should not show up in individual tenants' rents but there could be some exceptions. When rental housing markets are very tight, there might still be bargaining. In general, there could also be some selection bias. Recipients of housing allowance would, at the margin, select apartments with higher rents. In the case of social assistance, this possibility is even more obvious because (as pointed out above) then the whole rent is paid by the society (municipality) and so the potential tenant has no incentive to avoid high rents.

Even though the rental prices seem to be the same for all households, total rents do indeed differ but this is probably due to the fact that recipients of a housing allowance live, ceteris paribus, in larger apartments. This is in accordance with the rental housing demand estimates; housing allowance does indeed increase housing demand even if we control for total income and various background variables.

Finally, we combine the 2001 and 2002 (as well as 2005 and 2006) cross-sections into a single panel (half of the respondents are the same in these surveys) to see whether the relatively large change in allowances (used by Kangasharju (2010)) in 2001/2002 shows up in rents, or whether the so-called poverty package in 2005/2006 (which eliminated the base deduction from housing expenditures for families receiving social assistance) changed the rents of those eligible for a housing allowance and also social assistance. Then the estimating equation is of the form:

$$\Delta\log(R_{Ht}/Space_t)= c_0 + c_1D_1 + c_2D_2 + c_3 S_1+ c_4\Delta\log(Space_t) + u_t, \qquad (7)$$

where D_1 and D_2 indicate whether the household has received a housing allowance in the first or second year of the two-year panel sample. Accordingly S1 indicates that the head of the household has received social assistance in the first year (2005).

The results (Table 4 and Table A2 in the Appendix) suggest that the "law of one price" still holds in the rental housing market (rent changes are the same for receivers and non-receivers of housing allowance). It the first place, it looks like there is a difference but closer scrutiny points to the opposite conclusion[10]. This is also confirmed by robust estimators. As suggested by Figures 7 and 8, some outlier observations seem to produce the (erroneous) result that rents change in a different way for benefit receivers than for the rest of households. As for the "poverty package" effect, there seems to be some, even though not very strong, evidence that part of the increased social security benefits have been shifted to rental prices[11]. It may well

[10] Basically, the mean values of rental price changes (for receivers of housing assistance and for all households (living in rental housing)) appear to be different but the median values seem to be almost identical (see also Table 2 in the Appendix for the sample mean values). The sample size is so small that some extreme observations easily dominate the results (as can be from figures 6 and 7). Notice (Table A2) that in both cases a part of the subsidy seems to have gone to increased demand (size of apartment).

[11] Social assistance is a bit different from housing assistance in the sense that in most cases it is known to the landlord while housing assistance is not (rent is paid directly to the landlord). More important, of course, is the fact that the housing allowance always covers only a fraction of the rents.

be that the immediate effect of the package has rather been an increase in the size of apartments then a change in the rent level.

4. Concluding remarks

It is clear that a part of housing allowance is shifted to prices. The question remains only as to the magnitude of the shift. In this study, a conservative estimate is 0.33. Thus, one-third of an increase in housing allowance is shifted to market rents. That is, when the rents of all households in rental housing increase, the increase is compensated for only some of the households living in rental houses. None of the estimates suggest that the shift parameter is zero, rather that the effect is larger than one-third – maybe even one half.

One must keep in mind that the whole story does not end here. Housing allowances (in Finland, at least) are in practice indexed to market rents so that the allowances are adjusted annually according to developments in rental markets during the preceding 12 months[12]. This creates a multiplier effect which itself can even double the short-term impact[13].

It should be kept in mind that the increase in rents hurts those who are not eligible for housing allowance, basically the middle income households. They may try to escape higher rents by purchasing a flat or an own house, but capitalization of rents may increase the prices of these alternatives as well.[14] Thus, their real income will decrease and their housing demand will decrease even more. The situation is worse yet because they have to pay additional taxes to finance the housing allowance. Thus, in all, the housing allowance leads to larges changes in income distribution and so one cannot even be sure that at the limit the Pigou & Dalton principle holds. Moreover, a strongly income-related housing allowance leads to poverty traps because the effective tax rates of at least some households goes to 100 per cent. This, in turn, leads to adverse effects on labour supply, which are not of course good in terms of the functioning of the labour market and the rate of inflation.

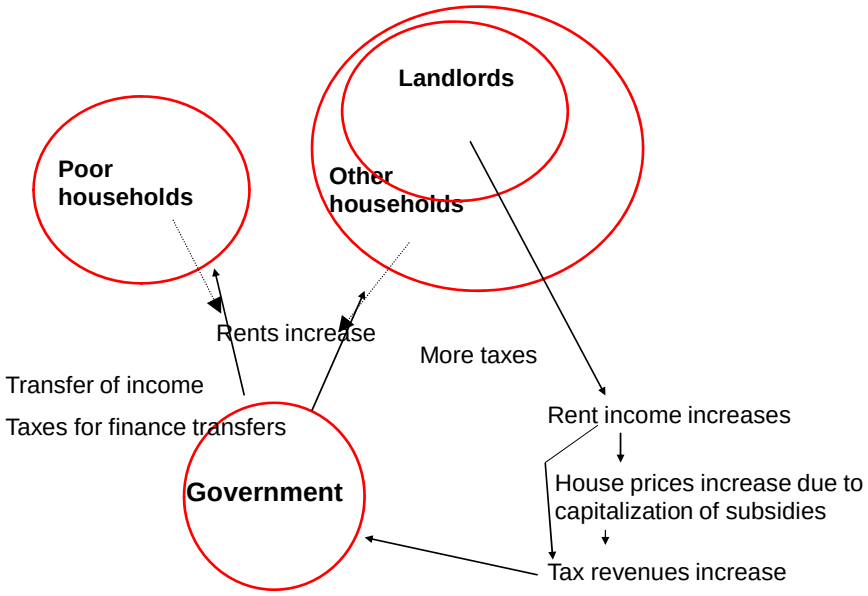
Therefore, we should carefully scrutinize the general equilibrium effects of the housing allowance and in particular consider the possibilities of reducing the eventual shifting of the allowance to markets rents and (de facto) indexation of housing allowances.

[12] Thus, the government decision is formulated as follows: "The maximum acceptable housing expenditures for housing allowance will be increased to correspond to the increase of rents of receivers of housing allowance".

[13] Assuming e.g. a system where the rent = αx (x= exogenous factors) + 0.2*allowance and allowance is indexed as: allowance = rent(-1) – β (=some constant) we arrive at the a long run solution of the form: rent = (α-.2*β)/.8. So the long-run shift factor is 0.25 instead of 0.20. If the coefficient estimate of *Max* were 0.5, the long-run shift factor would in fact be 100 %.

[14] Aggregate time series data from Finland for 1970-2010 (Figure 4) do indeed suggest that rents shift to house prices. In fact, Granger causality tests suggest that (the growth rate of) rents Granger cause (the growth rate of) house prices (F=3.04), while the opposite does not seem to be the case (F=1.34).

Figure 1 Key linkages in housing allowance



The figure illustrates the main linkages of the Finnish housing allowance/taxation system. In Finland, rental income as well as capital gains from changes in house prices are taxed according to capital income (the rate is currently 28 per cent). Otherwise, income tax rates are progressive rising up to 54.6 per cent.

Figure 2 Median values of rent and Max variables

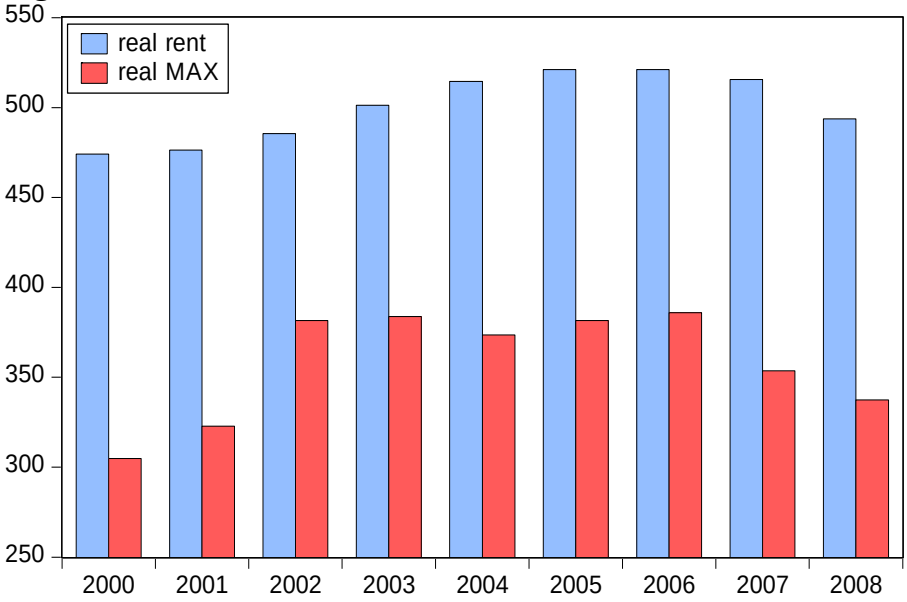
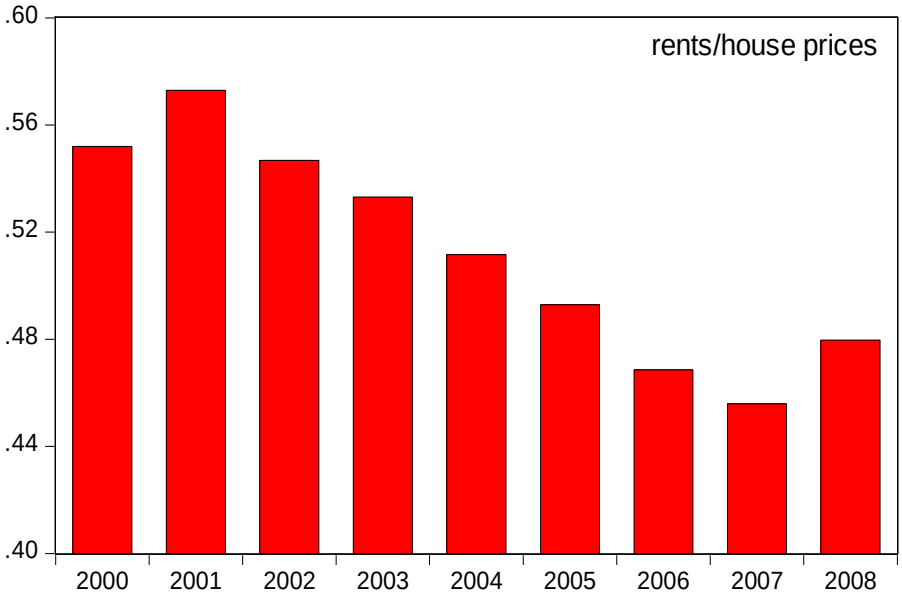
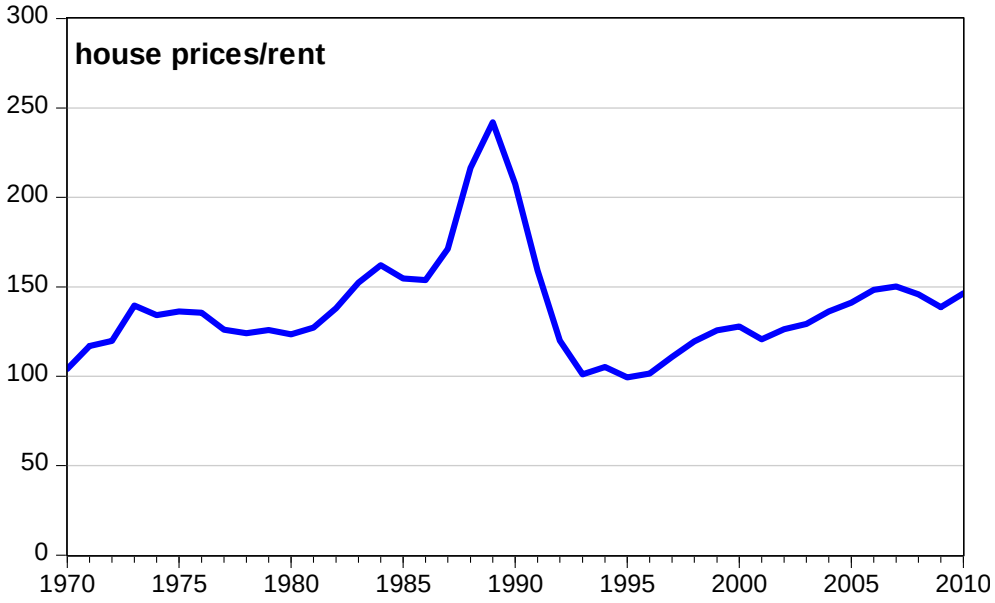


Figure 3 Median monthly rental prices relative to house prices



Rents are monthly rents so that the average gross yield is about 6 per cent p.a.. The graph corresponds to the 2000-2008 panel data

Figure 4 House prices/rent relationship 1970-2010



The graph is based on Statistics Finland's price indexes for houses and rents.

Figure 5 Median user costs and rental price/house price ratios, %

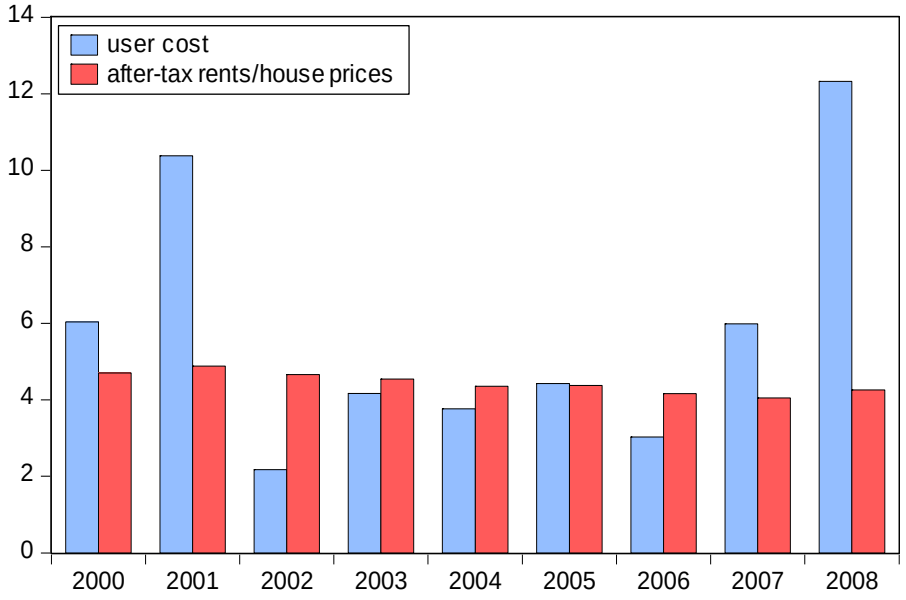
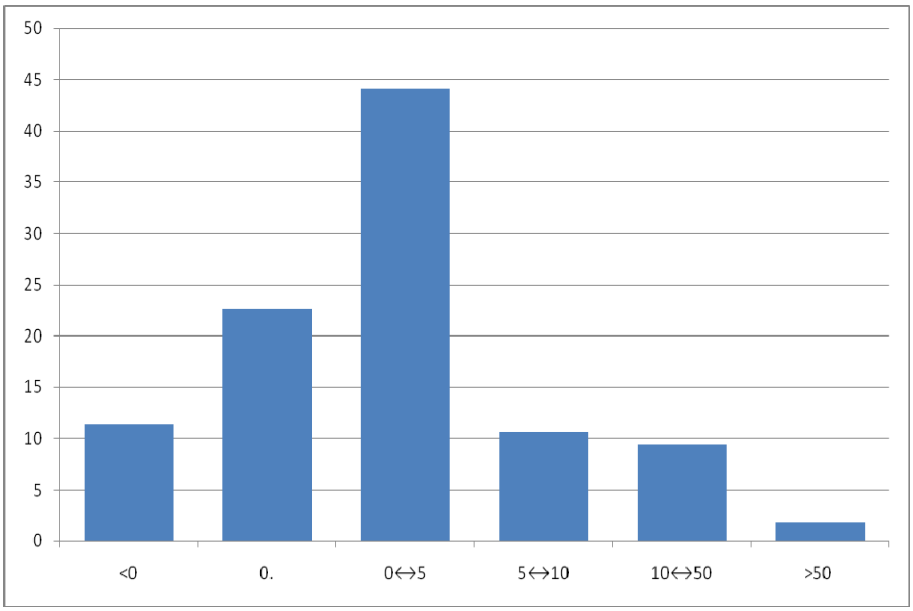
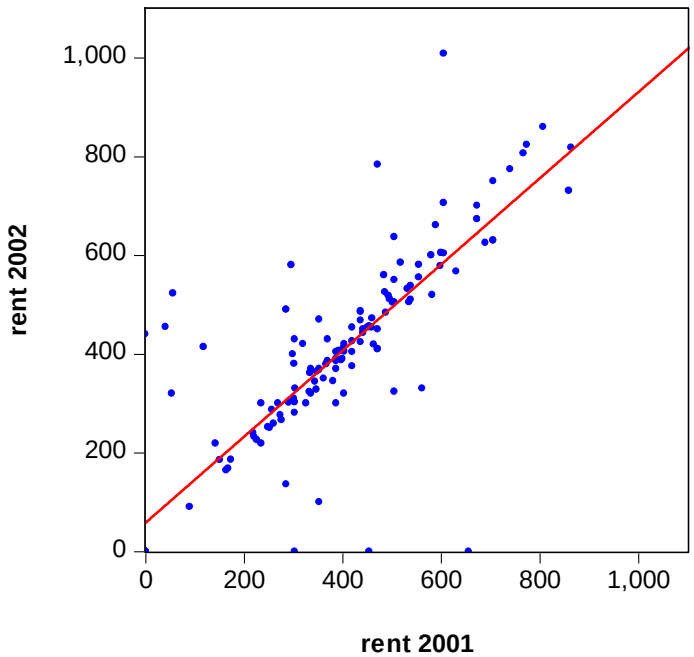


Figure 6 Frequency of changes in rental prices



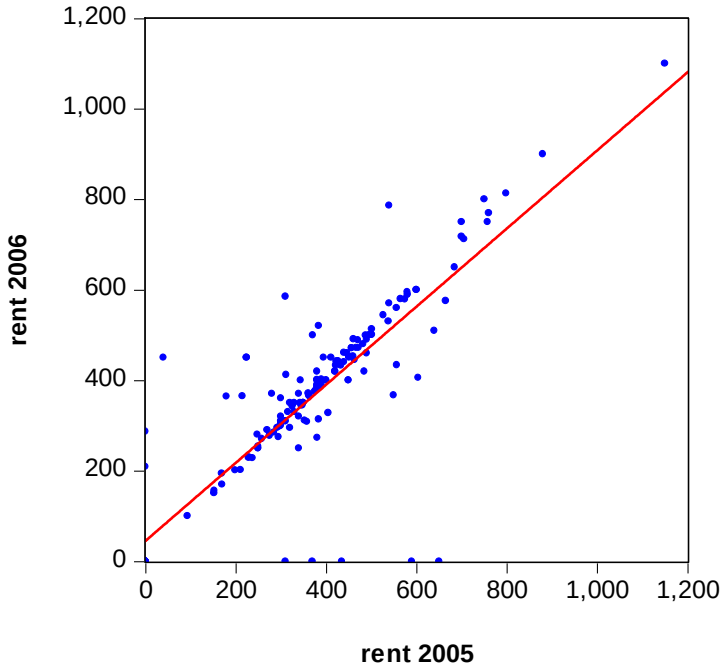
The graph corresponds to the 2000-2008 panel data.

Figure 7 Change in rental prices 2001-2002



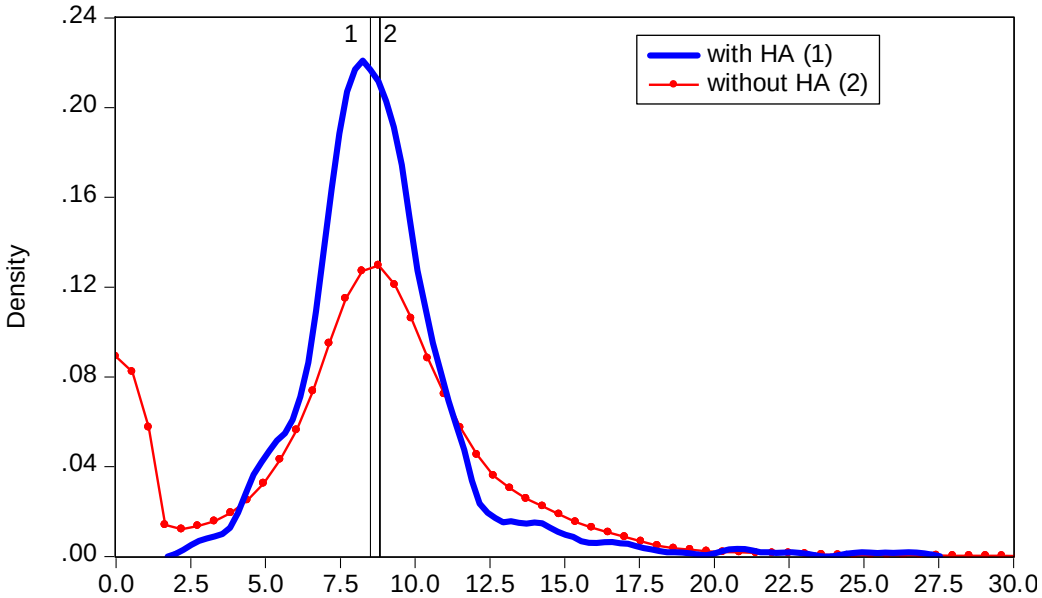
Sample consists of households that have received housing allowance in both years.

Figure 8 Change in rental prices 2005-2006



Sample consists of households that have received housing allowance in both years

Figure 9 Effect of housing allowance on rental prices



Lines correspond to median values for rents (R/m^2) for receivers and non-receivers of housing allowance (HA) in 2008

Table 1 Estimates of rent level equation from panel data

	1 *level*	*2* *level*	*3* *level*	*4* *log/m²*	*5* *level/m²*	*6* *level/m²*	*7* *level/m²*
Max/P	.331 (15.91)	.420 (50.87)	.326 (15.55)	.230 (27.04)	.609 (42.63)	.786 (20.98)	.780 (45.79)
uc	.144 (6.07)	.424 (11.87)	.174 (7.21)	.098 (11.04)	.195 (3.78)	.083 (1.47)	-.035 (0.18)
Space	.023 (23.56)	.022 (73.66)	.023 (23.27)	-.329 (44.87)	-.177 (26.28)	-.121 (9.63)	-.021 (26.96)
N	-.027 (5.36)	-.035 (10.55)	-.026 (5.19)	.195 (1.31)	-.113 (12.57)	-.179 (11.48)	-.102 (5.68)
N of children	.007 (1.67)	.011 (3.20)	.009 (2.00)	.349 (2.74)	.054 (7.86)	.062 (8.60)	.106 (5.66)
Y/P	.357 (6.37))	923 (14.43)	.437 (7.41)	.006 (5.95)	.041 (4.15)	.032 (3.17))	.778 (5.43)
Age of the house	-.506 (19.10)	-.365 (33.49)	-.505 (19.01)	-.181 (17.71)	-.038 (6.25)	-.032 (5.07)	-.002 (0.35)
old tenant	-.094 (2.11)	-.186 (16.16)	-.084 (1.83)	-.072 (3.47)	-.003 (3.06)	-.003 (2.55)	..
No change		-.119 (30.64)	-.037 (11.30)	-.013 (11.39)	-.065 (9.12)	-.060 (8.30)	..
Helsinki dum	.007 (14.08)	.006 (35.73)	.007 (13.91)	.003 (16.95)	.021 (17.23)	.020 (17.09)	.003 (30.29)
R^2	0.955	0.771	0.956	0.900	0.897	0.895	0.463
SEE	0.2445	0.4770	0.2437	0.0903	0.0053	0.0053	0.0112
DW	1.47	0.31	1.47	1.44	1.47	1.48	1.53
Fixed effects	CS +local	CS	CS +local	CS + local	CS + local	IV, CS +local	local only

The dependent variable is real rent (in equations 4-7, however, it is real rent per square meter). In the case of rent per square meter , the Max variable is also expressed in terms of square meters. Numbers inside parentheses are robust-values. CS denotes cross-section fixed effects, "local" denotes the presence of municipality dummies). All estimates, except for equation 6, are OLS estimates. Equation (7) is estimated for new rental contracts only. In IV estimation, lagged values of rent and housing allowance plus the current value of house prices are the additional instruments. "old tenant" indicates tenants that moved to the apartment before the end of 1985. Helsinki dum indicates a dummy for the city of Helsinki.

Table 2 Estimates of housing demand equation from panel data

	1 level	*2 log*	*3 log***	*4 log*	*5 log*	*6 log*	*7 log*	*8 log*
Allowance/P	.503 (23.53)	.186 (70.09)	.183 (73.91)	.215 (84.39)	.068 (49.69)	.078 (52.72)		.006* (10.13)
Allowance Dummy							1.323 (50.20)	
Y/P	.101 (18.01)	.139 (48.26)	.137 (47.77)	.172 (50.75)	.046 (34.78)	.057 (36.89)	.044 (32.29)	.013 (14.57)
N	.008 (61.16)	.328 (123.7)	.330 (123.2)	.295 (99.89)	.088 (56.24)	.080 (50.52)	.468 (379.5)	.124 (74.67)
$Rent/m^2/P$	-4.024 (122.1)	-.421 (121.5)	.410 (108.1)	-.441 (125.9)	-.155 (61.58)	-.172 (63.40)	-.333 (96.71)	-.131 (55.27)
No change	-.002 (21.57	-.019 (12.73)	-.018 (12.41)	-.020 (13.62)	-.058 (31.04)	-.060 (32.47)	-.018 (11.10)	-.062 (32.36)
$Space_{-1}$					.721 (213.4)	.711 (205.9)		.739 (223.1)
R^2	0.704	0.716	0.716	0.723	0.905	0.906	0.684	0.901
SEE	12.24	0.2214	0.2214	0.2186	0.1284	0.1274	0.2234	0.1304
DW	0.37	0.32	0.32	0.33	1.56	1.54	0.27	1.58
Fixed effects	No FE	No FE	No FE	Period	No FE	Local only	No FE	Local only

*) Lagged value of Allowance/P is used instead of current value. Dependent variable is size of apartment (Space). Otherwise, notation is the same as in Table 1. (**) The equation is estimated with the Instrumental Variable estimator using real house prices and lagged real rental prices as instruments. It was also estimated with the LAD estimator but with no marked difference in results as the following coefficient vector for the equation (column) 2 shows: [.227 .192 .265 .-.485 -.020].

Table 3 Estimates from 2008 cross-section data

Number	*1*	*2*	*3*	*4*	*5*	*6*
Dep.var	*Rent/m²*	*Rent/m²*	*Rent*	*Space*	*Space*	*Log(Space)*
Allowance	.008			.676	.900	
	(1.61)			(2.22)	(2.43)	
Allowance dummy		.008	24.259			.072
		(0.06)	(2.73)			(4.84)
Y	.018	.017	.017	.253		.171
	(3.44)	(3.37)	(3.73)	(6.43)		(11.97)
W					.271	
					(5.41)	
Tr					.463	
					(4.99)	
N	.181	.200	30.719	9.376	8.775	.350
	(2.10)	(2.36)	(4.17)	(17.86)	(19.13)	(24.14)
Space	-.072	-.072	2.622			
	(12.91)	(12.99)	(5.31)			
Metropol	2.890	2.899	150.0	5.356	5.436	.038
	(17.78)	(17.92)	(16.22)	(3.881)	(3.92)	(2.16)
Rent/m²				-2.994	-2.930	-.353
				(10.46)	(10.34)	(12.27)
R^2	0.371	0.371	0.459	0.544	0.548	0.602
SEE	2.738	2.740	155.0	17.619	17.556	0.275

Y denotes household gross income, W wage income and Tr income transfers (other than housing allowance). Otherwise, the notation is the same as in Table 1. Tabulated estimates are un-weighted but weighting changes the results only marginally. We also extended equation (2) by including the following variables (t-ratios inside parentheses): construction year of the house (3.14), region (3.74), age of head of household (2.76), gender (0.47), receives social assistance (0.71), excessively indebted (0.39), private market housing (8.28), employment-related housing (0.46), municipality housing (0.92), non-profit organization provided housing (5.61). Additional controls do not affect significance of housing allowance dummy, its t-ratio remains as low as 0.02.

Table 4 Estimates from 2001/2002 and 2005/2005 panels

	1	2	3	4	5
constant	.030	.021	.024	.024	.014
	(2.53)	(7.82)	(2.97)	(2.80)	(7.87)
Δ(Space)	-.603	-.567	-.564	-.566	-.455
	(9.94)	(67.77)	(7.98)	(7.94))	(73.00)
A2001>0	.062	.014			
	(0.36/0.97)	(1.72)			
A2002>0	-.021	-.020			
	(0.40)	(2.41)			
A2005>0				.010	.001
				(0.27)	(1.37)
A2006>0				-.012	-.996
				(0.28)	(1.16)
S2005			.033	.032	.007
			(1.08)	(1.07)	(1.37)
SEE	0.331	..	0.236	0.235	..
Method	OLS	Huber	OLS	OLS	Huber
Data	2001-2002 panel	2001-2002 panel	2005-2006 panel	2005-2006 panel	2005-2006 panel

Dependent variable is the change rate of rental price. With OLS, both corrected (White) and unadjusted t-values are reported. S2005>0 corresponds to a dummy for households that received social assistance in 2005. Analogous notation applies to A2001 - A2006. Huber indicates the Huber robust estimator. The data are weighted by the panel weights.

References

Bertrand, M., Duflo, E., Mullainathan, S. (2004), "How much should we trust differences-in-differences estimates", *Quarterly Journal of Economics* 119 (1): 249– 275.

Bils, M. and Klenow, P. (2004) Some Evidence on Importance of Sticky Prices. *Journal of Political Economy* 112. 947-985.

Ditch, J. Lewis, A. and Wilcox, S. (2001), "Social housing, tenure and housing allowance: an international review". In-house report 83, Department Work and Pensions.

Fack, G. (2006) "Are housing benefits an effective way to redistribute income? Evidence from a natural experiment in France," Labour Economics13(6), 747-771.

Gibbons, S. and Manning, A. (2003) The incidence of UK housing benefit: evidence from the 1990s reforms. CEP Discussion Paper 597.

Hiekka, S. and Viren, M. (2008) Does housing allowance increase rents? Finnish Labour Institute's Working paper 241.

Kangasharju, A. (2003), "Does the receivers of housing allowance pay a higher rent (in Finnish)?"Government Institute for Economic Research (VATT) Discussion Paper 101.

Kangasharju, A. (2010), "Housing allowance and the rent of low income households". *Scandinavian Journal of Economics* 112, 595.617.

Korkeamäki, O. and Uusitalo, R. (2006), "Employment effects of a payroll-tax cut – evidence from regional tax exception experiment", IFAU Working Paper 2006:10.

Loikkanen, H. (1982) Housing Demand and Intra-Urban Mobility Decisions: A Search Approach. Commentationes Scientiarum Socialium 17, Helsinki.

Lyytikäinen, T. (2006), "Rent Control and Tenants' Welfare: The Effects of Deregulating Rental Markets in Finland". Government Institute for Economic Research (VATT) Discussion Paper 385.

Musgrave, R. (1959), "*The Theory of Public Finance",* McGraw-Hill, New York.

Rosen, H. (1985), "Housing subsidies: Effects on housing decision, efficiency, and equity", in Acerbic, A. and Feldstein, M. (ends) *Handbook of Public Economics I.* Amsterdam, North-Holland: 374-420

Susin, S. (2002), "Rent vouchers and the price of low-income housing", *Journal of Public Economics* 83: 109– 152.

Viren, M. (2009), "Does the value-added tax shift to consumption prices. AUCO Czech Economic Review 3(2), 123-142.

Appendix 1 Illustration of Finnish housing allowance system

gross income	housing expenditures that are not compensated	housing expenditure			
		200	400	600	810 =max
		housing allowance			
735	0	160	320	480	646
900	70	104	264	424	590
1200	164	29	188	348	575
1500	270	0	104	264	430
1800	390	0	0	168	334
2300	605	0	0	0	162

Numbers refer to Helsinki area. All numbers are expressed in euros per month. The size of household is 3 and the size of the flat 77 m^2.

Appendix 2 Change rates of rental prices (rent/m^2) and size of apartment

	all tenants		*tenants receiving housing allowance*		*tenants receiving also social assistance*	
change in rental prices	mean	median	mean	median	mean	median
2002/2001	2.20	0.77	6.26	0.77		
2006/2005	2.24	0.70	1.12	1.09	1.97	1.30
change in size						
2002/2001	5.42	0.00	3.62	0.00		
2006/2005	5.76	0.00	8.27	0.00	8.27	0.00

Source: Finnish income distribution database. Data are weighted by panel weights.

Figure A1 Length of stay (years) in same rental apartment

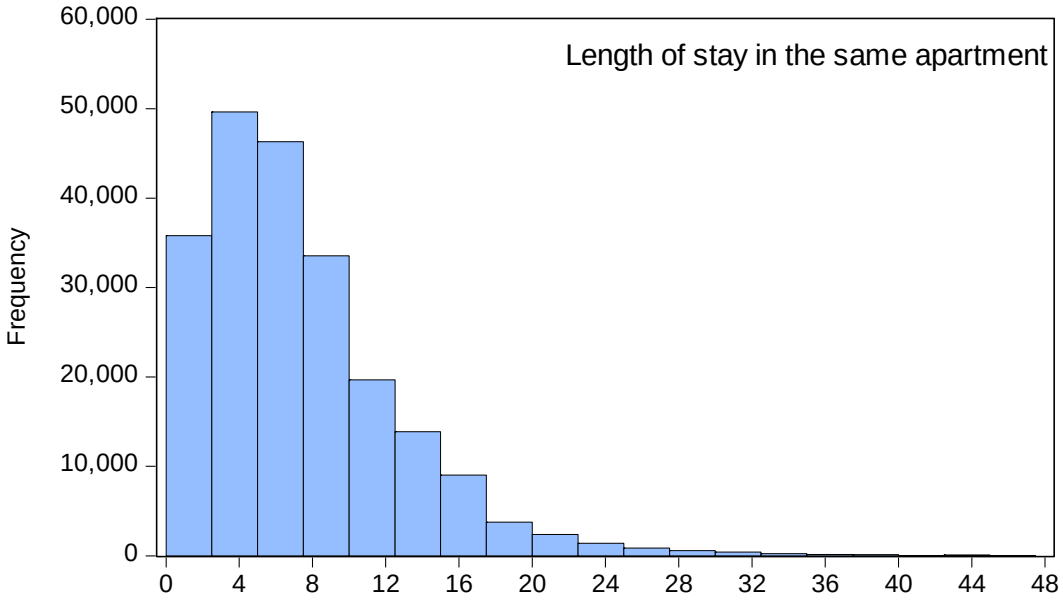
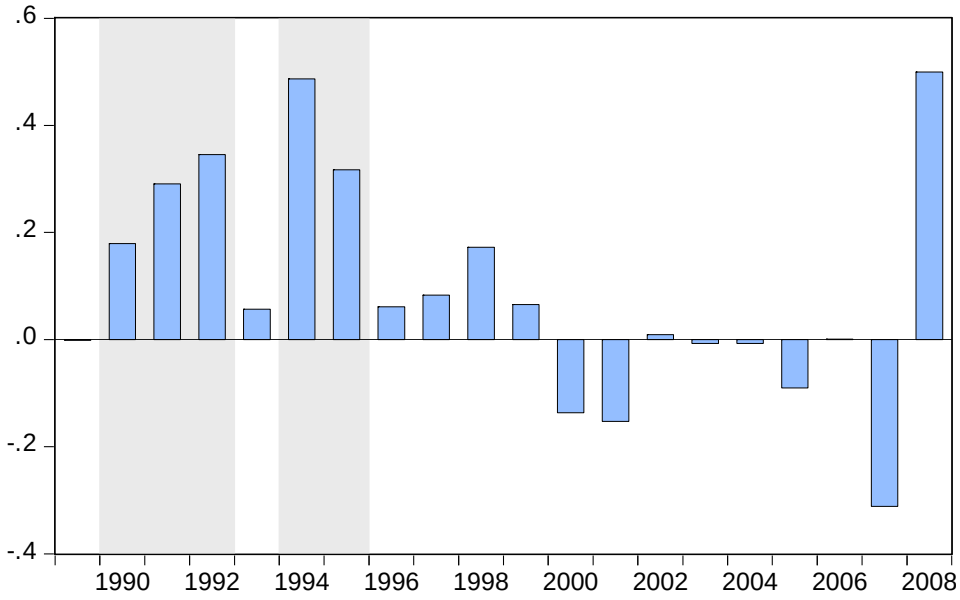


Figure A2 Coefficient of housing allowance dummy in cross-sections, 1989-2008



Estimates are derived from repeated cross-sections from 1989-2008. In shadowed cases, the coefficient is significant at the 5 per cent level .The coefficient is derived from equation (2) in Table 3.

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