Housing allowance: Subsidy to landlords?*

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This paper deals with incidence of housing subsidies. This property is analyzed using Finnish panel data from biggest Finnish cities. The main data set includes 50 000 households that have received housing allowances for the period 2000-2008. Preliminary results suggest that a part of subsidies will indeed go rents. A conservative estimate of the size of shift is 15 per cent but it is well possible that the number is even 25 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 program. Our results seem to be consistent with other research results that have also ended up with relative high rent effects. If this is indeed the case, it is well founded to reconsider the need for reforming the system of housing subsidies at least with respect to the share of costs that remains on households' own account.

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

1. Introduction

This paper deals with the incidence problem of government income transfers. The problem of incidence is very common in taxation but obviously it is also relevant for government transfers and subsidies. It becomes apparent when one tries to answer to the question of who in the very end is going to pay the tax or receive the transfer. The idea is that the burden of taxes (similarly, the benefit from transfers and subsidies) may shift from the original agent to the market counterpart even though the original agent has the legal obligation to pay the tax (or receive the subsidy) and take care of the proceedings of the payment or the receipt. The issue becomes quite complicated when we consider it in a general equilibrium setting which is illustrated in

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Figure 1. Housing allowance does not only affect income of the poor but also 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, housing allowance represents also a typical *public choice* problem. Here, we ignore these elements and focus on the incidence question only.

In the case of taxation, we know the basic results of incidence pretty well. Very shortly, all depends on supply and demand elasticities of the respective aggregate supply and demand curves when we face perfect competition. In the case of monopoly, things are more complicated so that even over-shifting may take place (Musgrave 1959)[2].

As for income transfers or subsidies, we know a lot less. 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 a comparison of housing allowance systems).

Housing assistance in Finland is quite extensive. Currently it includes 160 000 households (out of 2450 000 households) and the expenditures come close to 500 Mil. Euros (which is roughly 0.3 per cent of GDP).[3] Housing assistance is also related to social assistance which is distributed using the Housing assistance rules. Within social assistance all housing expenditures (which qualify these rules) are paid to poor households that have no or very little income.

The effects of housing assistance are analyzed in relatively numerous studies due to the fact that in a form or another it is used in most countries. A useful survey is provided by Rosen (1985). Evidence from more recent policy experiments is provided by Gibbons and Manning (2003) using the UK data. Gibbons and Manning arrive at the result that even 50 % of assistance shifts to rents. An even higher estimate is obtained by Fack (2006) who found the representative number for the French housing assistance reform was as high as 78 %. In the United States, Susin (2002) estimated the rent effects of housing vouchers and found the effect to be about 16 per cent. In Finland, there as two studies by Kangasharju (2003 and 2008) which have produced quite different results. The first one arrived at an estimate of 15 per

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

[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, in the case 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.

cent while the latter got a much higher value (60-70 per cent). Both studies used single changes in the assistance parameters in the *differences in differences* framework where receivers of the housing assistance were controlled.[4] Finally a study and Hiekka and Viren (2008) ought to be mentioned. Basically, it used similar data as the current study but the sample for limited to 1000 households in the Turku city area. The study arrived at the tentative results that one fourth of housing allowance shifts to rents.

This study mainly uses panel data for Finnish households who have received housing assistance (sometimes) during the period 2000-2008. Altogether 50 000 households are included in the data. Basically, 9 major changes in the housing assistance are considered during the period but because different households have different possibilities of getting housing assistance (due to income, location and so on) we have also quite a lot of cross-section heterogeneity in statutory housing assistance levels which altogether provide much more variability in both the rents levels and (exogenous) housing assistance.

2. Background for empirical analyses

To find out the magnitude of incidence problem we consider the conventional supply-demand framework. In the first place, we assume that the demand for rented houses takes the following from:

$$Q = D(Y/P, A/P, N, P_H/P) \tag{1}$$

Where Q denotes the demand for housing services (space, quality, location and so on), Y income (excluding housing allowance), A housing allowance, N the size of the household, P_H the rent level and P the general price level. The supply of rental housing is, in turn, determined by the following function:

$$Q = S(P_H/MC), \tag{2}$$

where MC denotes the relevant marginal cost of the rental housing.

To measure these costs we use house prices (in fact, the regional indexes of house prices). Basically, we should use some sort of user of housing which after all is relatively easily constructed. This time, we however, use this simpler proxy.

By setting (1) and (2) equal, we may solve the system in terms of P_H which takes the following form:

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

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

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 completely inelastic and demand perfectly elastic housing allowance shifts completely to rents (and thus goes to landlords). By contrast, if the supply side functions well in a sense being very price elastic (and competitive, of course) housing allowance would just increase the tenants' income and show up increase demand for housing. Intuitively, one might expect some sort of 50 – 50 outcome although the only way to find out the truth is to estimate (3) scrutinize the parameter values of Max

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

$$(p_H/p)_{it} = a_{0i} + a_1(MC/p)_t + a_2 N_t + a_3 Space_t + a_4 Age_t + a_5(Y/p)_t + a_6 Max_t + u_{it}, \quad (4)$$

Where p_H denotes the rent level, p the (Consumer Price Index) CPI, MC the house price index, N the size of household (number of people), $Space$ the size of flat, Age the age of the flat, Y income (prior to 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).

The model is estimated using the fixed effects model as the basic specification although we scrutinize all versions fixed effects models, that is: 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 Max does not directly depend on the actual rent level. It only measures the potential maximum achievable allowance that can be received for the flat in question (given the age of the flat and the location of flat). Obviously, the choice of the flat (in addition to the tenure choice) is endogenous which makes the Max variable to some extent endogenous as well. But it is hard to take the consequences of this choice problem into account.[5]Obviously there is some simultaneity link 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 merit note.

The main data source is the Finnish National Pension Fund (FNPF) that 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 pretty accurate compared e.g. to various survey measures.

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

The FNPF data cover 9 years (2000-2008) and include 50 000 households from 345 municipalities. Most of them come from 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 the periods in which housing allowance is not paid. The effective number of observations (after taking account all missing observations) is hence "only" 140 000. Although the data are good there is one problem with data: the data include only households that have received housing allowance. Thus, in the data we have no proper control group. In many cases the same households have received housing allowance during the whole sample period so that it is also a bit difficult to distinguish "new" rent level and "existing rent levels". Fortunately the data are large enough to facilitate comparison of new and existing (old) contracts.

The Finnish Income Distribution Data (FIDD) is much smaller (the 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 possible variables for income, taxation, income transfers and related items. The data are partly in a panel form but here we have just used the newest cross-section to see whether it makes any difference if we focus on households that receive housing allowance and households which do not receive housing allowance. Thus, basically we try test the "law of one price" in the Finnish rental markets. In addition, we use these data revisit the demand equation for rents housing.

Some idea of the Finnish system can be obtained from the enclosed graphs. Figures 2 and 3 illustrate the mean values of rents and the Max variable, Figures 4 illustrates the relationship between rental price and the demand for rental housing and finally, Figure 5 gives some idea of the presentence of rents (showing the annual frequency of changes in rents)

3. Interpretation of results

The estimation results are presented in Tables 1-3. Table 1 deals with the rent level equation (4) which is estimated from the Finnish panel data. From the same data, we have estimated also a demand equation for rental housing. Finally, we estimated a rent and rental housing demand equations from the 2007 cross-section data of the Finnish income distribution survey.

The demand equation is quite simple (double log) model of the following form:

$$Space_{it} = b_{0i} + b_1(p_H/p)_{it} + b_2 N_t + b_3(A/P)_t + b_4 Age_t + b_5(Y/p)_t + b_6 Space_{it-1} + u_{it}, \quad (5)$$

where *Space* denotes the quantity of the housing that is in practice measured by the space of the apartment while *A* denotes the housing assistance.

Before considering the estimates it is worthwhile to consider the dynamics of rents that is illustrated in Figure 5. Quite clearly, a considerable proportion of rents is not changed every year. The rents which have been decreased are also in most cases "constant rents": reductions are usually very small (something like rounding errors).

As for the result in table, we see that they are relatively robust in terms of panel data estimation procedure and variable transformations (level vs. log). The estimates of the shift parameter are all highly significant suggesting that the value of elasticity parameter is somewhat between 0.2 and 0.4 so that a very conservative estimate is just 0.2. Rents increase along with the price of houses and household income. By contrast, the age of house has a negative impact. Real rents also decrease if the tenant remains in the same flat for longer time. To some surprise, the role of the household size remains somewhat ambiguous. This is probably due to the fact that the MAX variable already includes the impact of the household size (a bigger family gets automatically a bigger household allowance).

The demand curve (5) estimates in table 2 are also easy to interpret: higher income increase demand and 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 the size of the flat and the effect seems to be larger than the effect of wage (other) income. This could, of course, reflect simultaneity between the size of the apartment and the housing allowance but even though we use just an allowance dummy or lagged allowance we get (ceteris paribus) a positive effect.

We also scrutinize the demand behaviour using the Income Distribution Database cross-section data for 2007 (Table 3). The data allows testing the importance of housing allowance in the case where only a part of households receives housing allowance. Quite clearly, rents are related to housing allowance, the coefficient of this variable is much higher the coefficient of wage income or other income transfers. The result is in fact well in accordance with the basic aim of the housing allowance, that is, an improvement of the housing conditions of the poor.

The cross-section data quite clearly suggests that the price of one law holds in the sense that rents (per squares meters) for housing allowance receivers and non-receivers are the same (see e.g. column 2 in Table 3). Actual (total) rents do indeed differ but this probably due to the fact that those who receive housing allowance live, ceteris paribus, in larger apartments.

4. Concluding remarks

It is all clear that a part of housing allowance shifts to prices. The questions only of the magnitude of the tax shift. In this study, a conservative estimate is 0.2. Thus one fifth of an increase in housing allowance shifts to market rents. That is, the rents of

all households in rental housing do increase. It is also well possible that the true number is larger than 0.2.

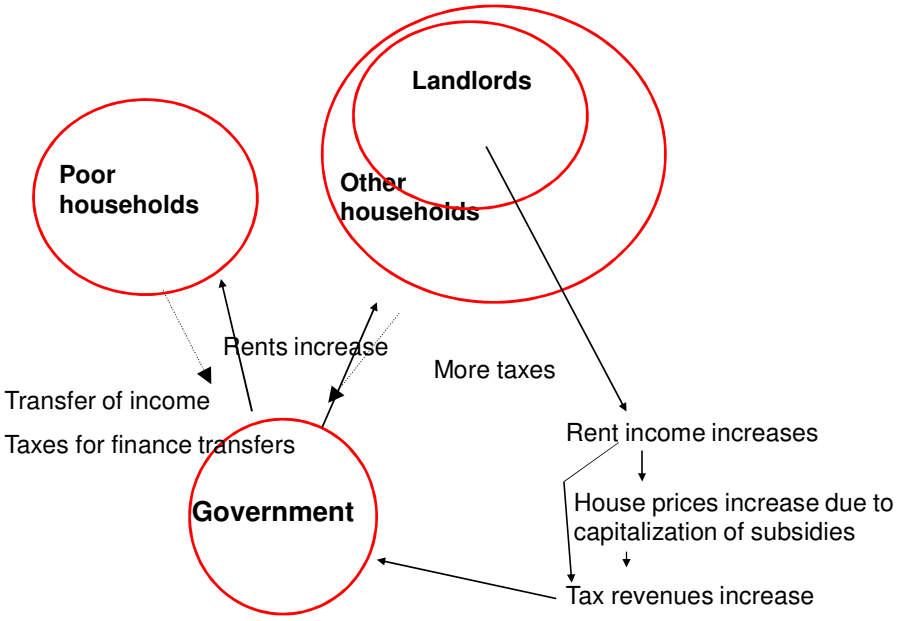
One has to keep in mind that the whole story does not end here. Housing allowances (in Finland, at least) are in practice indexed to market rents so that the allowances are adjusted annually according to developments in rental markets during the preceding 12 months. This creates a multiplier effect that can even double the short-term impact[6].

It has to be kept in mind that the increase in rents hurt those who are not eligible to housing allowance, basically the middle income households. Their real income will decrease and their housing demand will decrease even more. The situation is deteriorated still more because they have to pay additional taxes to finance the housing allowance. Thus, in all, housing allowance leads to larges changes in income distribution and so cannot even be sure that at the limit the Pigou & Dalton principle holds. Moreover, strongly income related housing allowance leads to poverty traps because the effective tax rates 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 thing thinking about the functioning of the labour market and the rate of inflation.

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

[6] Assume e.g. that we have a system where the rent = α (= exogenous factors) + 0.2*allowance and allowance is indexed as: allowance = rent(-1) – β (=some constant) we will arrive at the 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 estimate of *Max* were 0.5 the long-run shift factor would in fact be 100 %.

Figure 1. Some key linkages of housing allowance



Source: own creation

Figure 2. Mean values of the rent and the Max variable.

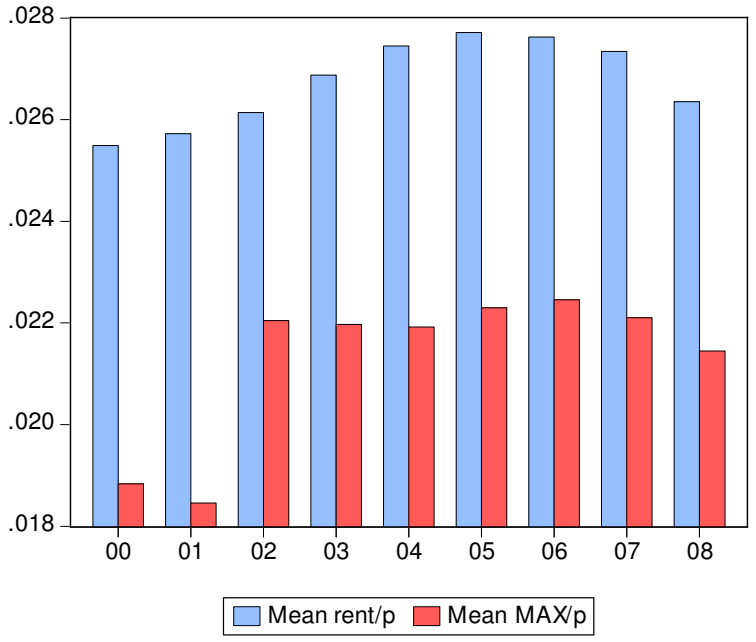


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Figure 3. Maximum assistance (*Max*) in relation to house prices

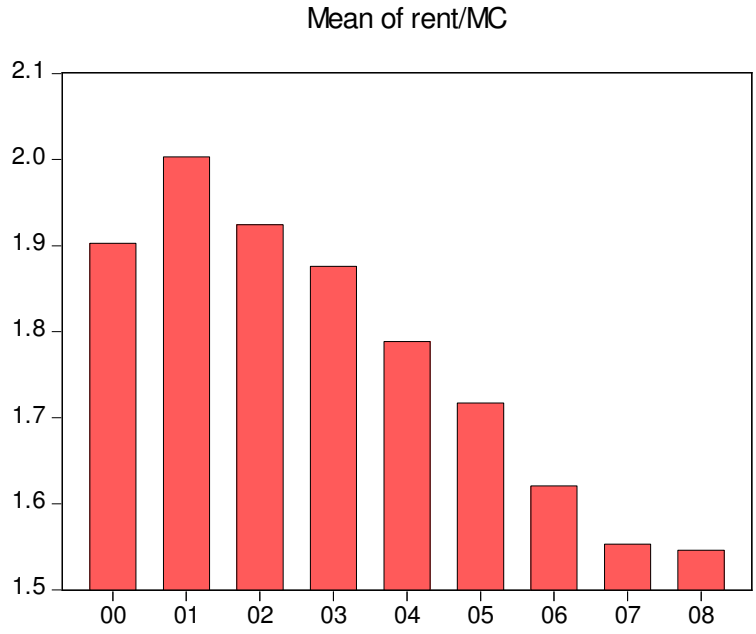

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Figure 4. Scatter plot between the apartment size and the rent level

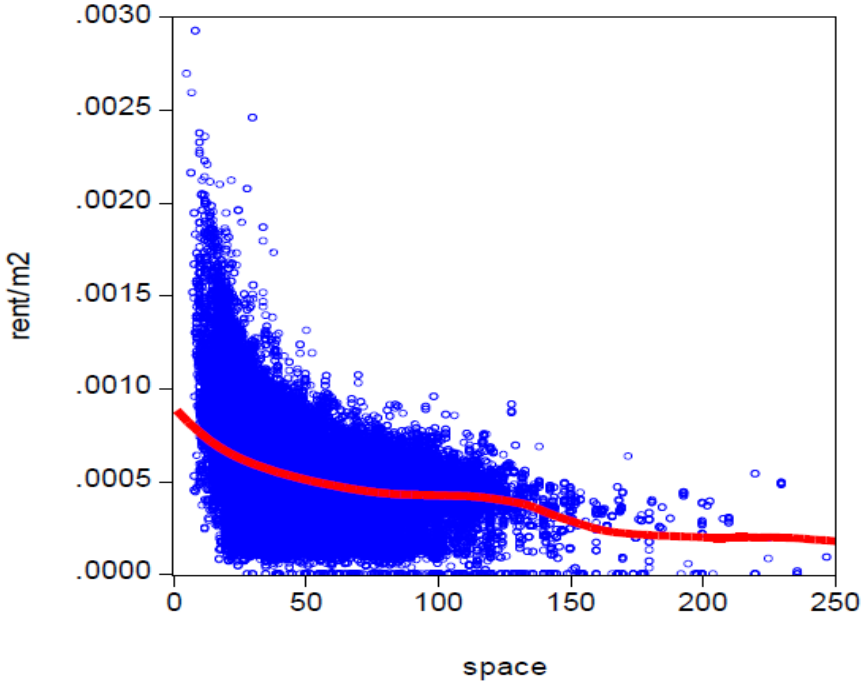

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Figure 5. Frequency of changes in rent levels

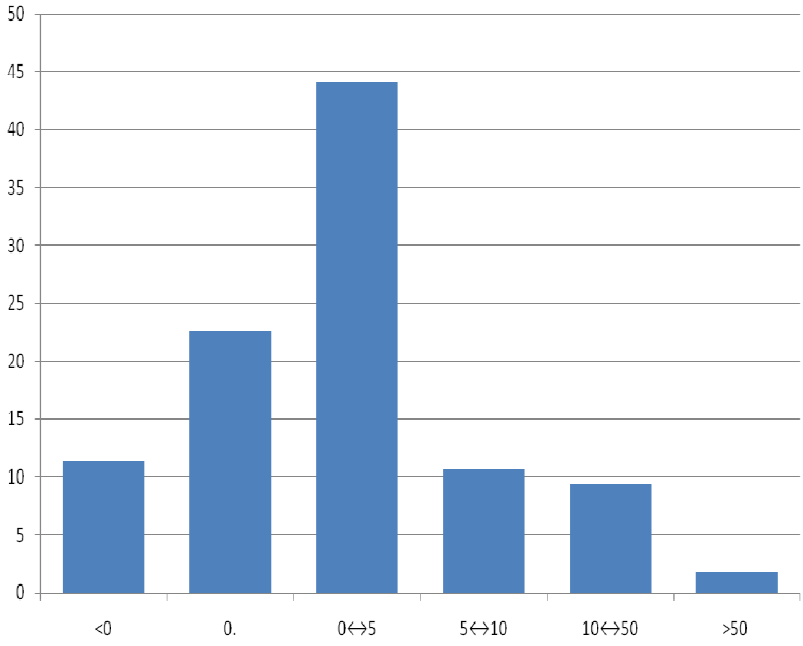

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Table 1. Estimates of the rent level equation form the panel data

	1 *level*	*2 level*	*3 level*	*4 log*	*5 log*	*6 level rent/m²*
Max/P	.435 (42.02)	.429 (26.65)	.269 (14.67)	.345 (36.36)	.204 (20.35)	.583 (41.69)
MC/P	.352 (51.00)	.389 (47.66)	.342 (43.92)	.235 (49.78)	.219 (48.03)	4.267 (25.17)
Space	.185 (37.06)	.194 (24.69)	.226 (23.95)	.361 (45.58)	.434 (53.72)	-.002 (27.80)
N	-.185 (9.53)	-.310 (8.25)	-.006 (1.67)	-.022 (4.96)	.018 (4.02)	-.006 (7.71)
Y/P	.038 (30.74)	.042 (8.56)	.033 (5.42)	.009 (8.96)	.005 (5.25)	.040 (5.15)
Age of the house	-.013 (15.46)	-.020 (8.88)	-.027 (12.24)	-.005 (6.06)	-.008 (9.43)	.035 (6.36)
No change		-.057 (16.61)	-.045 (14.02)	-.020 (16.49)	-.017 (14.23)	-.008 (10.11)
R^2	0.935	0.952	0.956	0.952	0.956	0.895
DW	1.28	1.48	1.49	1.45	1.46	1.47
Fixed E	CS	CS	CS +local	CS	CS + local	CS + local

Source: own creation
The dependent variable is the real rent level. Numbers inside parentheses are corrected t-values

Table 2. Estimates of the housing demand equation from the panel data

	1 level	*2 log*	*3 log*	*4 log*	*5 log*	*6 log*	*7 log*
Assistance/p	.503 (23.53)	.186 (70.09)	.215 (84.39)	.068 (49.69)	.078 (52.72)		.006* (10.13)
Assistance Dummy						1.323 (50.20)	
Y/P	.101 (18.01)	.139 (48.26)	.172 (50.75)	.046 (34.78)	.057 (36.89)	.044 (32.29)	.013 (14.57)
N	.008 (61.16)	.328 (123.7)	.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)	-.441 (125.9)	-.155 (61.58)	-.172 (63.40)	-.333 (96.71)	-.131 (55.27)
No change	-.002 (21.57	-.019 (12.73)	-.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)
Panel	No FE	No FE	Period FE	No FE	Local	No FE	Local
R^2	0.704	0.716	0.723	0.905	0.906	0.684	0.901
DW	0.37	0.32	0.33	1.56	1.54	0.27	1.58

Source: own creation

*) Lagged value of assistance/ p is used instead of the current value. The dependent variable is the size of the apartment. Otherwise, notation is the same as in Table 1

Table 3. Estimates from the 2007 cross-section data

Number *Dep.var*	*1* *Rent/m²*	*2* *Rent/m²*	*3* *Rent*	*4* *Space*	*5* *Space*	*6* *Log(Space)*
Assistance	.169 (2.51)			1.515 (4.06)	1.776 (4.62)	
Assistance Dummy		.127 (0.84)	28.656 (3.47)			.088 (6.16)
Y (W/Tr)	.024 (6.07)	.022 (5.57)	.025 (6.42	.253 (8.57)	.296 / .542 (9.05/6.01)	.167 (13.81)
N	.401 (5.59)	.444 (6.40)	45.896 (7.91)	10.030 (18.95)	9.270 (15.72)	.366 (27.09)
Space	-.079 (15.85)	-.079 (15.88)	1.799 (5.65)			
Rent/m²				-2.799 (15.74)	-2.773 (15.60)	-.355 (16.77)
R^2	0.242	0.240	0.398	0.566	0.577	0.616
SEE	2.914	2.918	155.0	17.30	17.19	0.273

Source: own creation

Y denotes here household gross income, W wage income and Tr income transfers. Otherwise, notation is the same as in Table 1. Space is measured by the number of quadrate meters

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