

# A Model of the Housing Privatization Decision: The Case of Russia

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## **A Model of the Housing Privatization Decision: The Case of Russia**

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### **Abstract**

This study addresses the issue of housing privatization in Russia in the course of the 1990s. Privatization was started to create a housing market in order to efficiently allocate resources in the use and production of housing, and to phase out the state budget financing of housing. The dwellings were offered to their residents free of payment. The objective of this study is to offer a better understanding of the structural components of privatization by formally modeling housing privatization decision from the household point of view. The model is based on a trade-off between certain value of renting and uncertain value of owning. Using the results of the theoretical model, an empirical model of the privatization decision from the point of view of the household is formulated.

Keywords: P25 Urban, Rural and Regional Economics; R21 Housing Demand; P36 Socialist Institutions and their Transitions; P21 Planning, Coordination and Reform.

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## **1. Introduction**

In the early 1990s the Russian government launched a series of measures to transfer ownership of municipal housing to the tenants. The Government promoted housing privatization or transferring the ownership of dwellings to the existing tenants, to enable the creation of a housing market, in particular a secondary housing market where the old housing stock can be traded.

Advantages of a housing market, like that of any other market, are the efficient allocation of resources both in the use and production of housing, as well as reducing the search costs necessary for barter. In the Soviet Union, residents had no right to sell their housing but they could exchange their dwelling for another. The latter was possible only when there was a mutual coincidence of wants and the situation was highly inefficient. In a market situation the need to satisfy this double coincidence of wants is obviated. The market offers a supply of available housing from which the households wishing to acquire housing are able to choose. Similarly, households can sell their existing housing on the market and acquire the funds necessary to purchase housing that better fits their needs.

The Government as an economic agent has been pursuing housing privatization policy in order to phase out state budget based financing of housing. Another objective has been to shift the maintenance and utility costs onto dwelling owners reducing a considerable burden on the state.

An additional set of arguments for the creation of a housing market has to do with the linkage of housing markets to other markets for economic fundamentals, such as labor and capital markets. A well functioning housing market is important for improving economic performance as it facilitates geographical mobility of workers. The housing market also

influences financial markets through mortgage lending and other use of housing assets as collateral in financial instruments.

While the motivation for housing privatization has been similar across all post-socialist countries, the Russian experience has been quite distinctive in its implementation. Unlike in many other post-socialist countries where housing was sold to the residents at discount prices, in Russia dwellings were offered to their residents free of payment following the transfer of ownership from the state to the municipalities. Nevertheless mass housing privatization did not take place even though by becoming owners of their dwellings, people acquire a valuable asset free of charge. The absence of payment for owning the dwelling makes the decision different to that of the choice under the right to buy policy in non-transition economies, notably the U.K. and the Netherlands where public housing was offered for sale to the tenants in the early 1980s (Whitehead, 1993). While there has been little theoretical analysis of the right to buy, allowing for zero price and imperfect housing markets would make the tenure choice literature (Henderson and Ioannides, 1983, Rosen et al, 1984, Brueckner, 1986) applicable to analyze housing privatization in Russia.

The research problem addressed in this study is why in Russia in the first half of the 1990s there was a lackluster response to the homeownership offer. Despite the fact that privatization was free and despite public support for housing privatization, exemplified by 70% of nationally surveyed households wishing to own their dwellings in 1993, only 18% of eligible dwellings were privatized in that year. (See Table 1 in the Appendix for the stated preference for privatization based on the Russian Longitudinal Monitoring Survey and Table 2 for annual 1989-2002 privatization levels from the State Statistical Agency). This paper offers an analytical perspective on why households did not privatize in the early 1990s

despite stated preference for privatization and virtually costless ownership transfer<sup>1</sup>. The research objective is to suggest the determinants of household decision to privatize their dwellings.

The paper is organized as follows: the remainder of this section contains the review of the literature on housing privatization in Russia and a brief discussion of the issue of maintenance of housing stock as it relates to the housing privatization decision. In Section 2 a theoretical model based on a trade-off between the certain value of renting and uncertain value of owning is developed. In Section 3 the logit model of the privatization decision is formulated using the results of the theoretical model. This section also includes a detailed account of the data used in the analysis. Section 4 concludes with suggestions for further research and policy implications.

### ***1.1 The Literature on Housing Privatization Decision***

A limited number of studies addresses the determinants of the decision to become formal owners of the dwelling versus being an occupant and renting from the municipality in Russia. These studies are primarily descriptive and focus on the socio-economic background of those privatizing their dwellings. Also, most of them are studies of the emerging housing market in Moscow.

Guzanova (1998) uses the data from the Moscow Longitudinal Survey to describe privatization trends in the city. She notes that the two groups most likely to privatize their apartments are the pensioners and the relatively wealthy. Unlike the emerging affluent stratum of the population, the elderly are not likely to sell the dwellings they privatize. She

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<sup>1</sup> A household wishing to privatize the dwelling had to submit to the municipality a notarized list of adult household members that were registered as residents at the address

also suggests that sociological factors such as education are important determinants of the privatization decision. Bater (1994) provides a break-up of privatization status by occupational group in Moscow. By 1994, the highest share of privatized dwellings by occupation belonged to artistic professionals (53.5%), the second (43%) belonged to pensioners. The smallest share belonged to blue-collar workers (14.2%) and government employees (15.2%). This typology of privatization by occupation, calculated based on the occupation of the reported household head, does not take into account the possibility of joint decision-making by adult members of one household that belong to different professions. Lower share of privatization by workers and government employees can be explained by higher share of these occupational groups living in apartments belonging to the employer. Government agencies and industries were reluctant to give up ownership of the property and the tenants could not privatize as long as the property had not been transferred to municipal ownership.

Winterbottom and Struyk (1995) use the survey data from 2200 Moscow households collected as part of the Urban Institute/USAID project. They report that households that privatize but do not sell their dwelling are poorer than state renters who have not privatized, suggesting the store-of-wealth explanation for housing ownership. They also report that apartments that have been privatized or sold on the market have higher area/person ratio.

Struyk and Daniell (1994) study what type of families privatized their dwellings and why privatization levels are different across cities. Their hypothesis is that a dwelling is more likely to be privatized when its market value is high and when the tenants want to bequeath the dwelling; factors impeding privatization are uncertainty over maintenance and strong tenancy rights of municipal renters. The study uses survey data from seven Russian cities to

estimate a logit model of privatization decision. The explanatory variable dwelling value was estimated using a hedonic model where prices for comparable apartments were reported by developers. The authors find that higher dwelling value has a positive effect on privatization. They also conclude that enterprise housing is less likely to be privatized than municipal. Older households are more likely to privatize. While the study established a positive relationship between *intelligentsia* (households with higher education) and privatization decision, professional categories had no effect on privatization decision. Zavitsa (2006) studies housing inequality in Russia and finds no association between transitions to different housing and household resources (e.g. income) and occupational status. A recent study by R. Yemtsov (2007) is concerned with whether homeownership post-privatization plays a part in rising income inequality. The author examines the data on privatization and income and suggests that income level was not related to how quickly the household privatized the dwelling.

In contrast to Russia's give-away of housing to the residents, state-owned housing in other transition economies was mainly sold to the tenants at below-market prices. Hegedus and Tosics (1994), Daniel (1997) identified the following factors as the most important ones in a households' decision to buy their housing from the state: (i) the difference between perceived market value and the sale price, (ii) security of tenure (against perceived rent increases/possibility of eviction), and (iii) control over maintenance. In contrast to Russia where tenancy rights remained strong, the threat of eviction has been noted as a motive for housing privatization in transition countries outside of the former Soviet Union (Douglas, 1996).

### ***1.2 Major Renovation and Maintenance of the Housing Stock***

The problem of major renovation of dilapidated housing stock in Russia has been the subject of policy debates and widely discussed in the media. Kosareva and Struyk (1993) suggest that it is uncertainty over the future cost of maintenance and major renovation of housing stock that has led to incomplete privatization in Russia. Provision of cheap housing was seen as part of the social contract between the state and the people and resulted in extremely low rent, subsidized utility payment and low-cost recovery from tenants. (The ratio of combined rent and utility payment to income was a low of 0.025 in the Soviet Union). No capital cost recovery was included in the rent contributing to the problem of deferring maintenance into the future and creating a backlog in renovation. Because of the distortions embedded in the socialist economic system the state was severely resource constrained and did not provide adequate maintenance. As evidenced by data in Table 3, in the 1990s the amount of housing undergoing major renovation each year was steadily decreasing and the amount of decrepit and unsafe housing increasing with the gap between the two widening<sup>2</sup>. The backlog of maintenance carried over from the past may be prohibitive to finance for the residents, especially the low-income ones. Lack of market mechanisms to finance major renovation backlog in Russia may have made renting from the municipality the preferred option for those who came to rely on the municipality and the state to resolve the major renovation issue.

Besides major renovation the questions of routine maintenance and management of multi-family housing were likely to play a part as determinants of the privatization decision for multi-family dwelling residents in the early to mid 1990s. There were no private property

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<sup>2</sup> Real Estate section of the online news service lenta.ru reports in June 2009 that after the major renovation of buildings the price of dwellings in these renovated buildings increased on average by 20% in Moscow.



management companies, no established homeowners associations or condominiums<sup>3</sup> and the management was continued to be performed by the municipal management committees essentially unaltered from the Soviet time. In the absence of alternatives to familiar municipal management remaining a municipal renter would have looked like a safer option compared to private ownership with less certain maintenance arrangements. These factors contributed to the fact that at the beginning of the housing reform period “being a state-tenant has been economically much more attractive than being an individual owner who bears all the maintenance costs” (Renaud, 1994). The following model captures these salient features of housing reform in Russia and illustrates the above reasoning.

## **2. A Two-Period Model of Privatizing versus Renting**

With homeownership having a distinct advantage of housing becoming a potential source of income for the household, the option of renting from the municipality retained the familiar features of the state-owned housing system. In particular, rents have been usually low and utility payments continued to be subsidized. Tenancy rights have been strong with eviction occurring only if the housing was deemed unsafe. In order to explicitly consider behavioral foundations for privatization choice, the model developed in this study incorporates the effects of factors determining the decision to privatize, such as the level of

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<sup>3</sup> In the early 1990s there were no established homeowners associations or condominiums because of weak legal provisions to enable their functioning. Despite the legal provisions of the Housing code (first passed in 1996) designed to support the shift to management by home-owners, multi-family housing management largely remains in purview of municipalities. The insufficient progress in owner-management of multi-family dwellings is mainly due to difficulty in setting up financing of long-term maintenance. In addition coordination problems of organizing dissimilar households in large buildings as well as adverse selection problems discourage residents from taking part in homeowners’ organizations. In recent years private property management companies have been established but merely at the high end of the market and in new buildings where major renovation is not an issue.

maintenance payment, uncertainty of payment for maintenance, and the rate of time preference. The logit model then ascertains empirical regularities broadly based on the theoretical model developed below.

### ***2.1. Model Setup***

The model set up draws on earlier work by Brueckner (1986) and Henderson and Ioannides (1983). The household chooses between the uncertain value of owning the dwelling and renting which involves no uncertainty. We assume that the household maximizes a simple two-period utility function where the second period serves as a proxy for optimal decisions made in all the future periods as in the Henderson and Ioannides (1983) formulation. In the first period the household receives income, pays rent and utilities, and saves for the second period. A household that owns its property also pays the (uncertain) maintenance fee. The model is set up such that in the first period the owner's and renter's utilities differ only by the uncertain maintenance payment. In other words, the owner and the renter are charged the same amount for housing by the municipality, but the owner additionally incurs the uncertain maintenance payment. This assumption is reflecting the fact that at the early stages of privatization during the early 1990s in order to encourage privatization of housing stock the government charged renters and owners the same heavily subsidized utility fee (Struyk and Daniell, 1994).

In period two the owner enjoys the privilege of bequeathing their wealth by either first selling the dwelling and bequeathing the money, or directly bequeathing the dwelling in addition to savings from the first period. In contrast the renter household in the second period has only savings from the first period at its disposal.

The household maximizes the expected utility of the consumption good expressed through the budget constraint. The consumption good serves as the numéraire with its price normalized to one. The household also consumes housing but the quantity of housing is fixed in this problem and the household only chooses whether or not to privatize the dwelling in which it resides. We use  $Y$  to denote income, and  $S$  to denote savings. In the model  $R$  stands for rent and  $K$  for the uncertain maintenance payment.  $V_s$  represents the increment to wealth from selling the privatized dwelling and  $V_B$  is the bequest value of the dwelling.  $V_s > V_B$  because liquidity is preferred to non-liquidity. The economy-wide interest rate is given by  $r$  and  $\delta$  is the individual's rate of time preference. The consumer's problem is stated as one of the two possible cases below:

(I) If the household chooses to own the dwelling, the problem takes the form of

$$\text{Max} \int_{k \min}^{k \max} U(Y - R - K - S) f(K) dk + \frac{\Theta V_s + (1 - \Theta) V_B + S(1 + r)}{1 + \delta}$$

where the second term can be denoted as terminal wealth,  $W_B$

The household prefers selling to bequeathing but he may not always be able to sell. Parameter  $\Theta$  may be interpreted as exogenous probability that the household is able to sell the dwelling. High value of  $\Theta$  reflects the notion of thick markets.

(II) If the household chooses to rent the dwelling, the problem takes the form of

$$\text{Max} U(Y - R - S) + \frac{S(1 + r)}{1 + \delta}$$

where the second term can be denoted as terminal wealth  $W_R$

The consumer has a Quadratic Utility function given by  $u = ac - bc^2$  where  $c$  is consumption good. The characteristic of the quadratic utility function is that the impact of

uncertainty of the consumer's income can be described as a function of two statistical parameters only – the mean and the standard deviation. Such a consumer prefers a higher average income (measured by the expectation of the probability distribution achieved by holding any particular portfolio of assets) and lower variability of income (measured by the standard deviation). Consider first the case of household dwelling owner for whom  $x = (Y - R - K - S)$  where  $K$  is uncertain in the first period. Using the fact that  $Ex^2 = \sigma_x^2 + \mu_x^2$  we can rewrite the owner's utility function as:

$$EU(Y - R - K - S) = a(Y - R - S) - a\mu_k - b(Y - R - S)^2 + 2b\mu_k(Y - R - S) - b\mu_k^2 - b\sigma_k^2$$

In the renter's case  $x = Y - R - S$  and the certain utility of renting in the first period is

$$U(Y - R - S) = a(Y - R - S) - b(Y - R - S)^2$$

To solve the consumer's problem we maximize utility with respect to savings and find the optimal level of savings for a consumer who owns their dwelling

$$S_{own} = (Y - R - \mu_k) - \frac{(1+r)}{2b(1+\delta)} - \frac{a}{2b}$$

and the optimal savings for those renting

$$S_{rent} = (Y - R) - \frac{(1+r)}{2b(1+\delta)} - \frac{a}{2b}$$

Note that  $(S_{own} - S_{rent}) = -\mu_k$ , i.e. that saving under ownership is less than saving for the renting case by the amount of expected maintenance payment.

Next we obtain the indirect utility for owning as

$$\Omega_{own} = a(Y - R - \mu_k - S_{own}^*) - b(Y - R - \mu_k - S_{own}^*)^2 - b\sigma_k^2 + \frac{\Theta V_s + (1 - \Theta)V_R + S_{own}^*(1+r)}{1+\delta}$$

Similarly, the indirect utility from renting is

$$\Omega_{rent} = a(Y - R - S_{rent}^*) - b(Y - R - S_{rent}^*)^2 + \frac{S_{rent}^*(1+r)}{1+\delta}.$$

We compare the expected utility of owning to certain utility of renting:

$$\Omega_{diff} = \Omega_{own} - \Omega_{rent}$$

which simplifies to:

$$\Omega_{diff} = \left( \frac{\Theta V_s + (1-\Theta)V_B - (1+r)\mu_k}{1+\delta} \right) - b\sigma_k^2.$$

Indifference between owning and renting implies that  $\Omega_{diff} = 0$ . Hence a parametric change that raises  $\Omega_{diff}$  makes owning more likely, and a parametric change that lowers  $\Omega_{diff}$  makes renting more likely.

We now do a few simple comparative static exercises. Evaluating the signs of the derivatives with respect to the selling and bequeathing parameters we get,

$$\frac{\partial \Omega_{diff}}{\partial V_s} = \frac{\Theta}{1+\delta} > 0; \quad \frac{\partial \Omega_{diff}}{\partial V_B} = \frac{1-\Theta}{1+\delta} > 0,$$

Hence the household is more likely to privatize the higher is the value of bequest. Next we consider the two statistical parameters relating to the level of maintenance payment  $\mu_k$  and uncertainty of maintenance payment,  $\sigma_k$ .

$$\frac{\partial \Omega_{diff}}{\partial \mu_k} = \frac{-(1+r)}{1+\delta} < 0; \quad \frac{\partial \Omega_{diff}}{\partial \sigma_k} = -b < 0,$$

Once again as expected we find that the household is more likely to rent the higher is the maintenance payment or the more uncertain is the maintenance payment.

The derivative with respect to the risk aversion parameter  $b$ ,

$$\frac{\partial \Omega_{diff}}{\partial b} = -\sigma_k^2 < 0$$

is negative, indicating that the more risk averse households tend to choose to rent.

The derivative with respect to time preferences parameter  $\delta$  is

$$\frac{\partial \Omega_{diff}}{\partial \delta} = - \left( \frac{\Theta V_s + (1 - \Theta) V_B - (1 + r) \mu_k}{(1 + \delta)^2} \right) < 0$$

To interpret this condition one can think of the first term in the denominator,  $\Theta V_s + (1 - \Theta) V_B$  as the benefit of owning,  $B_{own}$ . When  $\delta$  is high the expression is less negative implying that for the old privatization is more likely. The second term in the denominator  $(1 + r) \mu_k$  can be thought of as the benefit of renting,  $B_{rent}$ . This is because  $(1 + r) \mu_k$  is the amount the renter-household saves by not paying maintenance fee of the owner-household.

The derivative with respect to  $\Theta$ , the probability of selling the privatized dwelling on the market, is

$$\frac{\partial \Omega_{diff}}{\partial \Theta} = V_s - V_b > 0$$

implying that privatization is more likely in active markets where probability of selling the dwelling is higher.

### 3. The Logit Model

The objective of this study is to describe decision-makers' choices among alternatives of becoming the owner of its dwelling and renting from the municipality, and so a logit discrete choice model is used in the empirical part of the analysis.

Discrete choice models usually assume utility maximizing behavior by the consumer<sup>4</sup>. As suggested by the theoretical model in Section 2, the analysis below is based

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2. It is important to note that utility maximization is not a requirement of discrete choice models. The model is consistent with utility maximization but it can be used to represent decision-making derived from other decision modes (Train, 2003, Ben-Akiva and Lerman, 1985). A discrete choice model can support privatization choice as

on the premise that the household will privatize the dwelling if it is more valuable. That can be either because of the characteristics of the dwelling (higher quality lowers maintenance payment  $K$ ) and/or preferences of inhabitant household, such as lower risk aversion, perceived risk aversion, time discounting, household-specific value of sale, bequest. The theoretical model has been developed to motivate the specification of the econometric model. It must be noted that because of data constraints given the environment of undeveloped housing markets the set of available variables may not be ideal to operationalize the comparative static results. For example, as there were few transactions on the housing market, the market price was not available and the data on the number of transactions was not collected in the early 1990s.

The theoretical model suggests that the level of maintenance payment is an important factor affecting utility and hence the choice between owning and renting one's dwelling. Greater maintenance payment makes the household less likely to privatize. The level of maintenance is related to building quality, so higher maintenance is expected for buildings of lower quality and older buildings. Hence older buildings and those of lower quality are less likely to be privatized and, by the same reasoning, newer buildings and buildings of higher quality are more likely to be privatized.

The theoretical model also suggests that risk aversion is inversely related to privatization. Risk aversion may have an intrinsic relationship with demographic characteristics such as age, education and income. The uncertainty factor may be lower for those with better information about future state. In this case the more educated people might have a better idea about how the question of maintenance will be resolved in the future, so

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an outcome of utility maximization as well as an outcome of choice arrived at through learning or imitation behavior.

the  $\sigma_k$  parameter for perceived risk will be lower for people with greater levels of education. Hence education can be expected to be positively related to privatization. Another implication of the theoretical model is that households that have a higher rate of discounting the future, i.e. older households would be more likely to privatize. However if risk-aversion increases with age it would add a negative linkage between age and privatization.

Assuming decreasing absolute risk aversion would suggest a positive relationship between income and privatization as those with higher income would be less risk averse. However there is also an argument for a negative relationship between household income, wealth and privatization. Policymakers have regarded housing privatization as a “shock absorber” during the transition period when real incomes of the majority of the population have been declining. Ownership of dwellings would increase one’s wealth hence making poorer households more likely candidates for privatization.

The econometric model should also account for household-based differences in bequest and sale values of dwellings. The bequest motive will be stronger for older households making them more likely to privatize. Bequest and sale values may be low for households living in substandard and overcrowded dwellings. It has been the tradition under the socialist housing system to allocate housing on the basis of need, defined in relation to the government-established norm of dwelling area per person. Because they were eligible in the past, and the system remained in place at least for those already in the “queue”, overcrowded households may choose to wait for better housing provided they remain tenants of the municipality. Hence overcrowding is expected to be negatively related to privatization.

Finally there are many arguments for accounting for location effects. Kosareva and Struyk (1993) suggest that the reasons why privatization rates may differ between cities may



be due to the attitudes of the municipality to privatization. In addition enterprises owning enterprise housing may not be willing to let go of housing that they view as their property and in cities with a large share of enterprise housing privatization may consequently be slower. Using the same data source as this study, Berger et al, 2001 study of estimates of quality of life in Russian cities, finds important differences in amenities across the survey locations. They also find that people are paying high premium for better amenities.

Location effects can be important also because certain areas have traditionally been migration-destinations and so demand for housing and hence privatization rates are expected to be higher in such cities, (Guzanova, 1994). Some cities may experience high inflow of migrants from areas of armed conflict or other migration-pressures because of their geographic location (e.g. Rostov on Don has been the destination for people migrating from conflicts in the Caucasus).

### ***3.1. The Data***

The data used in the analysis come from the Russia Longitudinal Monitoring Survey (RLMS), an on-going nationally-representative survey of health and economic welfare in the Russian Federation started in 1992. The survey is maintained by the Carolina Population Center at the University of North Carolina at Chapel Hill.

The RLMS data contains a large and detailed set of socio-economic variables such as income, expenditure, employment, health, time use, housing and land use. The RLMS used stratified sampling of twenty primary sampling units (PSUs). Stratified sampling is used to ensure greater variability than would have been captured in a simple random sample of regions. Following the geographical distribution of the population the locations selected for

the survey tend to be concentrated in the Western and South-Western parts of the country. Only two sites are located in the Far East region. In each region data tend to be collected at a large-city sampling site and a small town or rural site located in the region (or oblast) around the city. This study uses the 1992-1994 data of the RLMS survey. The average number of households in a PSU for the 1992-1994 data was 360.

The primary reason for using the data for the 1992-1994 period is that the most comprehensive set of housing variables is available for the first round of survey data collection (year 1992) and the same set of households is traced for the third and the fourth data collection rounds<sup>5</sup>. The 1992 data contains privatization-related information such as households' stated reasons to privatize their dwellings (e.g. bequest motive). The 1992 data also contains the most detailed information on dwelling characteristics. The 1994 (4<sup>th</sup>) round question on the ownership status of the dwelling with a response category "privatized in the past few years" was used to construct the dependent variable for the analysis. The 1992-1994 data was merged using the household and location identifiers.

The data pertaining to the privatization decision were collected shortly after the privatization decision was made. The timing of the data collection minimizes the bias from maturation<sup>6</sup>. Another advantage of using the data from this early period of privatization is that it enables one to analyze the "early" decision-makers who privatized essentially in the absence of a developed housing market.

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<sup>5</sup> The survey underwent a major restructuring in the mid-1990s and as a result a different set of locations and households has been used from 1995 onwards.

<sup>6</sup> Maturation refers to the fact that if a lot of time passes between the time of privatization and the time of response, the respondents may state a different reason for privatization than the actual motivation or, simply, the respondents may forget pertinent information.

As time goes by, those who privatize may sell the dwelling and move. The households that moved are not traced by the survey so only the data for households that did not move between 1992 and 1994 are used in the analysis. For the 1992-1994 data the number of movers is smaller than for the subsequent years (around 2 %) so the sample that the study analyzes is least biased.

Another important factor that needs to be taken into account in the econometric specification is that the percentage of housing eligible for privatization may be substantially different by locations. In large cities nearly all housing is eligible for privatization but in small cities and population centers there was less non-private housing and hence the set of housing eligible for privatization is smaller. I excluded those households who “always owned their dwellings”, as well as those in cooperative housing who became private owners by default. Hence the data set only contains those households that have the option to privatize their dwellings. There were 2956 households in the data set used in the estimation.

### ***3.2. Variables and Model Specification***

#### *Dependent variable*

In the empirical analysis that follows it is assumed that the unit of analysis is the household who makes the decision to privatize the apartment. This is done to abstract from the decision-making within the household and assume that the decision is made by a single entity. The dependent variable is a dichotomous variable (1 for privatization and 0 for municipal) reflecting individual household choice for privatization. The dependent variable was constructed using the first round data on privatization decision, the dwelling ownership

data of the first, third and fourth round, and the fourth round data on the timing of privatization.

### *Explanatory variables*

The explanatory variables are divided into household characteristics and dwelling characteristics. The summary of variables is reported in Table 3.

#### *Household characteristics:*

Household characteristics include total household income, age of the household head, number of adults, and a dichotomous variable for one or more household members having University education or higher. The *education* variable is a proxy for perceived risk aversion factor with higher education associated with lower perceived risk aversion. The *age of household head* variable is reflecting the rate of time preference<sup>7</sup>. Household income and wealth were included to account for the relationship to risk aversion and to test the “housing as store of wealth” hypothesis. Risk-aversion and the need for liquidity may exert counteracting effects on the decision to privatize resulting in a non-linear (e.g. U-shaped) relationship between income/wealth and privatization. More specifically at lower levels of income risk aversion may lower privatization but the need for liquidity may increase privatization. Interaction variables separating higher and lower income groups were included in order to disentangle the effects. *The number of adults* controls for household composition because the decision of a household consisting of more than a nuclear family may be different from that consisting of a nuclear family. A multi-generational household may want

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<sup>7</sup> A potential problem that this data set presents for analysis is whether the reported household head is representative of the household in multi-generational households

to split thus accelerating privatization but on the other hand households in “crowded dwellings” may be delaying privatization waiting to be allocated better housing from the municipality.

### *Dwelling characteristics*

Dwelling characteristics include the characteristics of the building and the characteristics of the dwelling unit inside the building. Building characteristics include the age of building, minutes to transportation, type of building material (brick, or other material). Type of building material is included to account for differences in dwelling quality, and consequently differences in maintenance cost. Age of building is a proxy for the need for renovation in the absence of survey responses to the question on major renovation. Differences in maintenance cost are postulated to affect the decision to privatize. While there was a strong rationale to include the dichotomous variable for enterprise-owned dwelling to control for possible differences in the speed of privatization between municipally and enterprise-owned dwellings, there was not enough variation in the data as only 1 out of 751 cases of enterprise-owned housing was privatized. Dwelling characteristic is the apartment having a balcony which is a desirable feature. Variables such as kitchen space and ceiling height were not included as they are correlated with the decade the building was built. Total space and total living space appeared to have been measured with error on a number of observations and were not included. The urban/rural dichotomous variable is included to account for potential differences in privatization rates between urban and rural areas.

### *Random effects specification*

There may be unobserved characteristics of locations that contribute to the privatization decision, such as amenities or attitudes of the municipalities towards housing privatization. To better account for heterogeneity across the locations, a random effects specification with the error structure  $site_i + e_{ij}$  is assumed, where  $site_i$  is a random variable representing the deviation from the fixed effects portion of the predicted probability and  $e_{ij}$  is a random variable representing the deviation from the fixed effects portion of the predicted probability for household  $j$  at site  $i$ . Further the specification assumes that the observations are independent across locations but not necessarily within locations. For example some locations may have higher proportion of university graduates or buildings built in a particular time period. Hubert-White robust standard errors are computed.

### *Estimation and Results*

The model was estimated using STATA 9.0 program to fit generalized linear latent and mixed models (GLLAMM) (Skrondal, A. and S. Rabe-Hesketh, 2003). The results are reported in Table 4 in the Appendix.

The signs of the estimated effects are as suggested by the theoretical model. Higher quality reflected by newer buildings, brick wall material, balcony are positively related to the probability of privatization. There is also an expected result with respect to urban amenity: greater distance to public transport negatively affects privatization. There is no effect of urban location after accounting for effects of other variables. This result indicates that there appear to be no underlying differences in how privatization proceeded in cities and small towns.

Higher education has a positive effect on privatization decision. This result is expected: in the framework of the theoretical model higher education is associated with lower perceived risk aversion making privatization more likely. As predicted by the theoretical model, age of the household head also has a positive effect on privatization decision. The value of the estimated coefficient is small because it is the effect of each additional year of age on privatization. The estimated effects of age and education are consistent with the results reported for the logit model of Struyk and Kosareva (1994).

The number of adults has a negative effect, indicating that over-crowded households postpone privatization presumably in expectation of getting a larger dwelling from the state.

There is no effect of income or wealth on the privatization decision. The implication is that homeownership does not appear to be used as source of additional income by lower income households. Absence of a substantiated relationship to income does not allow to consider explanation based on risk aversion. It is also possible that income and wealth were measured with error because the respondents could have been misstating their responses.

#### **4. Conclusion**

While privatization is a normative objective of the Russian government, it still has not been completed. The current deadline for free-of-charge privatization of housing is set for 2010. This analysis highlights the fact that besides the uncertainty prevalent in the transition process, uncertainty over maintenance significantly affects housing privatization. This suggests that in order to foster housing privatization the Russian government needs to develop a more systematic approach for the maintenance of the existing housing stock. This along with less uncertainty over the legal and institutional framework of the economy will help in the privatization of housing. The econometric analysis reveals that education plays an

important role in the privatization decision. The fact that education is important seems to suggest that uncertainty plays a key role since the more educated are better able to predict the future and the (uncertain) outcomes of the proximate variables affecting privatization decision. Contrary to expectations, household income does not appear to have an effect on the privatization decision. An important policy implication of this result is that it does not support the notion that poorer households view housing as an asset and are taking advantage of its potential to improve their welfare as the housing reform envisaged. More generally it underscores the need for greater understanding of the role of income and wealth and their measurement during economic transition.

#### *Further Research*

This study concentrated on the issue of maintenance as the main obstacle to privatization of housing. There are other features of housing reform that influence the decision to become owners such as deadline to complete free of charge privatization that has been extended in the future a number of times and ended up not being credible. Another set of determinants of the privatization decision that was not analyzed in this study is that of intra-building governance. The component of uncertainty associated with intra-building governance was subsumed under the common uncertainty term. Management and governance issues are unequivocally important issues but the scope for empirical study is limited for lack of intra-building neighbor data.

The research questions in this study were conditioned by data availability. Since privatization is continuing to this day as municipal housing that can be privatized is being built, it could have been also appropriate to model the decision of when to privatize rather than whether to privatize. But because data on privatization is available for three survey



rounds for years 1991-1993, empirical testing using an econometric model (e.g. survival analysis for the actual decision-making period of the 1990s and beyond) would not be possible. However a theoretical model of more than two periods could involve working out the true discounted cost of purchase and renting and address the question of when to privatize.

An interesting caveat is that some households, such as overcrowded ones are more eligible for municipally-built free apartment give-away than others. Delaying privatization introduces additional uncertainty because the regulations with respect to types of households eligible for apartment give-away are changing. The theoretical model could incorporate the trade-off between delaying privatization, waiting for a give-away apartment from the state and immediate privatization. The specification of the econometric model could be enriched with the addition of a set of variables that reflect amenities across the locations (Berger et al, 2001). These variables could be constructed using the RLMS community survey data.

The contribution of this study is that it offers a better understanding of the structural components of the privatization decision in Russia. It is also one of the first attempts to formally model the phenomenon of housing privatization from the point of view of the household. The findings can inform housing policies in Russia and future housing privatization efforts in other countries.

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## Appendix

**Table 1. Percentage of households who answered “yes” to the Russia Longitudinal Monitoring Survey question: “Do you want your dwelling to become private property of your family?”**

<b>RLMS site</b>	<b>1992</b>	<b>1993</b>
St. Petersburg City	66.85	67.16
St. Petersburg Oblast	72.99	76.14
Novgorod city	67.80	64.43
Moscow city	67.45	72.39
Moscow oblast: town of Chekhov	58.88	74.49
Riazan oblast: Riazhski district	57.24	54.55
Riazan oblast: Saraevski district	62.00	54.32
Tatarstan: city of Kazan	63.46	76.88
Saratov oblast:	61.70	74.86
Kabardino-Balkaria: city of Nalchik	89.89	91.94
Stavropol Krai	91.43	75.00
Rostov oblast	85.03	80.13
Svedlovsk oblast	53.55	63.10
Chelyabinsk oblast	60.84	62.50
Altai: city of Gorno-Altai	67.16	83.33
Tomsk oblast: Zyraianski district	68.75	74.49
Primorski Krai	70.00	71.29
Total for surveyed sites	65.89	70.43

Source: Russia Longitudinal Monitoring Survey

**Table 2 Housing Privatization in Russia, 1989-2006**

	<b>Number of Privatized units, thousands</b>	<b>Total area of privatized units, million sq. meters</b>	<b>Privatized units as percent of units eligible for privatization</b>
1989	10	n/a	0.03
1990	43	2	0.1
1991	122	n/a	0.4
1992	2631	132	8
1993	5804	n/a	18
1994	2396	n/a	9
1995	1529	72	6
1996	1203	57	5
1997	1198	56	5
1998	959	46	5
1999	896	39	5
2000	922	42	4
2001	1302	62	6
2002	1395	68	7
2003	897		5
2004	1408		8
2005	1822		11
2006	1624		11
Cumulative in 2006	26161		66

*Source:* State Statistical Agency

**Table 3: Decrepit and unsafe housing, major renovation of housing stock, Russian Federation, 1990-2008**

	Major renovation of housing stock, thousands square meters	Decrepit and unsafe housing stock, thousands square meters	Percent of decrepit and unsafe housing stock in total housing stock
1990	n/a	32179.2	1.3
1992	22160	n/a	n/a
1993	22798	n/a	n/a
1994	9022	n/a	n/a
1995	11666	37723.5	1.4
1996	7349	40288.8	1.5
1997	6392	42350	1.6
1998	5060	45563.7	1.7
1999	4125	49622.9	1.8
2000	3832	65603.6	2.4
2001	4780	87826.1	3.1
2002	4833	88287.1	3.1
2003	4625	91255.3	3.2
2004	4768	92954.4	3.2
2005	5552	94589.1	3.2
2006	5302	95889.4	3.2
2007	6869	n/a	n/a
2008	12381	n/a	n/a

*Source:* State Statistical Agency

**Table 4. Summary of Variables**

Privatized their dwelling	22.5% of households
Number of adults in the household	Mean 2.1
Age of Household head	Mean 56
At least one household member University Educated	28.6% of households
Decade Building Built	Mode 1960s
Time of walk to public transportation	Mean 8 minutes
Unit with Balcony	70% of all dwellings
Brick building	42 % of all dwellings
Urban location	75.2%

**Table 5. Privatization Decision: Results of the Random Effects Logit Model**

	Marginal Effect for Continuous variable	Estimated Standard error of asymptotic coefficient	Z-value	P-value
# of adults in the household	-.3910275	.0596054	-6.56	0.0000
Age of Household head	.039452	0.0053843	7.33	0.0000
At least one University Educ.	.3827585	.09519	4.02	0.0000
Decade Building Built	.0727532	.0464229	1.57	0.117
# minutes to public transport	-.0338025	.0103766	-3.26	0.001
Unit with Balcony	.2761571	.1525446	1.81	0.070
Brick building	.2977753	.1235308	2.41	0.016
Urban location	.3202176	.2576236	1.24	0.214

**Table 5A. Random effects for locations**

	Mean effect	Standard error
St. Petersburg City	0.0808	0.1519
St. Petersburg Oblast	0.383	0.177
Novgorod city	-0.7011	0.2026
Moscow city	-0.1339	0.1691
Moscow oblast: town of Chekhov	-0.9122	0.2425
Riazan oblast: Riazhski district	-0.5282	0.2608
Riazan oblast: Saraevski district	-0.1438	0.4009
Tatarstan: city of Kazan	-3.1819	0.5523
Saratov oblast:	-0.1428	0.2522
Kabardino-Balkaria: city of Nalchik	-0.2555	0.1822
Stavropol Krai	1.3486	0.3358
Novocherkassk	0.2544	0.1807
Ekaterinburg	0.2758	0.1573
Rostov oblast	0.3829	0.1627
Sverdlovsk oblast	-0.4553	0.2822
Chelyabinsk oblast	-0.1046	0.3105
Altai: city of Gorno-Altai	1.94	0.3814
Tomsk oblast: Zyraianskii district	1.921	0.2681
Primorski Krai	-0.1725	0.1691
Ussuriysk	0.146	0.1655

