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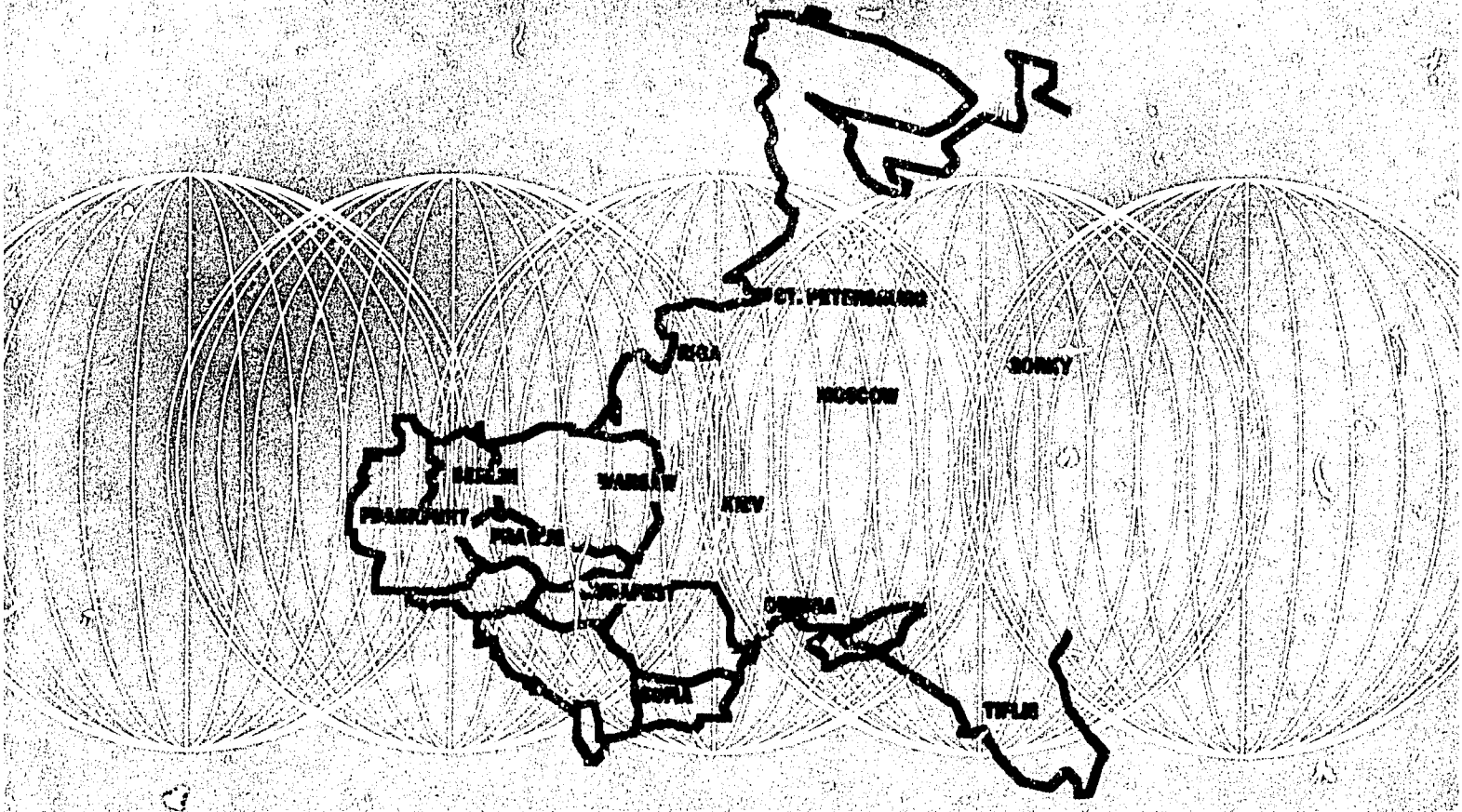

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HOUSING PRIVATIZATION IN MOSCOW: WHO PRIVATIZES AND WHY

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ABSTRACT

The purpose of this paper is to examine the extent of and attitudes towards privatization in Moscow. The findings are based on the results of the USAID sponsored household study conducted by the Russian Academy of Sciences Institute of Economic Forecasting in December 1992. The survey included questions on household characteristics including family size, occupations, and incomes, and attitudes towards privatization. These data enable us to examine which households in Moscow are privatizing their units and, furthermore, to determine a household's motivations for privatizing or for not privatizing their unit.

Several economic and social factors predominate in the decision to privatize. Results show that the higher value of the unit the more likely a household is to privatize. Pensioner privatize at a higher rate than other socio-economic groups; and, those in higher level or favored occupations, directors and intelligentsia, who are likely to have obtained better housing, also have a high rate of privatization.

EXECUTIVE SUMMARY

Privatization of state rental units has perhaps been the single most important policy reform undertaken to date in the Russian housing sector. Among municipalities Moscow's free of charge program, which was combined with an efficient system for processing applications, got off to a quick start and performed well during 1992. According to the State Statistical Office, 366,000 units were privatized in Moscow by the end of the year, or about 13 percent of the 1990 state housing stock. In short, the housing privatization program appears to be well on its way to achieving its primary objectives: transferring sufficient units to private ownership so as to form the basis of a private market, and giving a substantial number of families a genuine stake in Russia's economic reforms.

Many questions, however, remain unanswered. The following questions are addressed by this paper: Which households have availed themselves of the opportunity: those with higher incomes and white collar jobs, or all classes? How do pensioners behave? What motivates some families to privatize and others not to do so? To what extent did privatization increase throughout the year and when did households privatize? How many more units are likely to be privatized and what will influence these decisions?

We conclude that economic incentives appear to be the driving force behind housing privatization based on the results of our analysis of the data from the USAID sponsored survey of 2,000 households in Moscow conducted in December 1992 conducted by the Russian Academy of Sciences Institute for Economic Forecasting. Our results reveal the following:

- the higher the value of the unit the more likely the tenants are to privatize;
- pensioners privatize at a higher rate and earlier than other socio-economic groups;
- those in higher level or favored occupations, directors and intelligentsia, who are likely to have obtained better housing, have a higher rate of privatization;
- worries about increased maintenance fees are negative factors in the privatization decision and significantly lower the odds or privatization;
- the desire to will a flat to an heir is a positive factor;
- while pensioners privatize to will their flat to heirs, others privatize to acquire a valuable asset with the potential of providing rental income and/or to protect themselves from the uncertainty of the future of state rentals.

HOUSING PRIVATIZATION IN MOSCOW: WHO PRIVATIZES AND WHY

Perhaps the single most important policy reform undertaken to date in the Russian housing sector has been privatization of state rental units. Tenants have been given the opportunity to acquire their unit at little or no cost simply by requesting the transfer of ownership. The law "On Privatization of the RSFSR Housing Stock", passed by the Supreme Soviet in June 1991, mandated privatization of state-owned rental units to registered tenants. Local governments were given the possibility of charging tenants for space occupied above the nationally set minimum. Moscow, however, adopted free of charge privatization in January 1992, while most other cities opted for charging for "extra space". In December of 1992, the Supreme Soviet established free of charge privatization throughout the Federation.

Under the 1991 law privatization got off to a slow start. By the beginning of December 1991, only 90,000 units, or 0.4 percent of self-contained, state-owned rental units in Russia, had been transferred to private ownership. Privatization did not really get underway until early 1992 by which time local governments had determined the terms under which units would be transferred. The number of units privatized each month was initially quite small. However, by the end of the year the number of units being privatized each month had increased significantly—638,000 units in December alone, out of the 1992 total of 2.55 million units privatized. Among municipalities, Moscow's free of charge program, which was combined with an efficient system for processing applications, got off to a quick start and performed well during 1992. According to the State Statistical Office, 366,000 units were privatized in Moscow by the end of the year, or about 13 percent of the 1990 state housing stock.

In short, the housing privatization program appears to be well on its way to achieving its primary objectives: transferring sufficient units to private ownership so as to form the basis of a private market, and giving a substantial number of families a genuine stake in Russia's economic reforms.

While Russia's record of housing privatization is clearly impressive, and Moscow's even more so, many questions exist about this experience. Which households have availed themselves of the opportunity: those with higher incomes and white collar jobs, or all classes? How do pensioners behave? What motivates some families to privatize and others not to do so? To what extent did privatization increase throughout the year and when did households privatize? How many more units are likely to be privatized and what will influence these decisions?

This paper addresses these and other relevant questions for the City of Moscow. The findings are based on a survey conducted in December 1992 of a random sample of 2,000 housing units in Moscow which were state rentals at the beginning of 1992; some of these units were privatized during the year. The survey gathered substantial information about the about occupants' economic and

demographic circumstances, and their attitudes towards privatization, including the motivations of those who have privatized their units.

Overall, we conclude that economic incentives appear to be the driving force behind housing privatization. The value of the unit is a highly significant determinant of a household's decision to privatize. The higher the value of the unit the more likely the tenants are to privatize. Similarly, worries about increased maintenance fees significantly lower the odds of privatization.

Evidence also reveals that those in higher level or favored occupations, directors and intelligentsia, who are likely to have obtained better housing, have a higher rate of privatization. Furthermore, reasons for privatizing as reported by tenants indicate economic motivations for privatizing. The desire to will a flat to an heir is a positive factor and concern over increased maintenance fees and property taxes are negative factors in the privatization decision. Pensioners privatize in order to will to the unit to heirs. Others privatize to acquire a valuable asset with the potential of providing rental income and/or to protect themselves from the uncertainty of the future of state rentals.

The following section outlines our hypotheses about who is privatizing and who is not privatizing and why or why not. This section also presents the methodology employed in testing the hypotheses. The next section describes the data and definitions used to determine the privatization status of households according to demographic characteristics. Following is a section presenting descriptive findings from the survey data answering the questions about who is privatizing, why or why not, and how privatization trends changed throughout the year. Lastly, the results of logit models of the privatization decision are presented.

CONCEPTUAL FRAMEWORK AND METHODOLOGY

The standard economic model of tenure choice casts the household's decision to become a homeowner in terms of the flow of the costs (positive and negative) of renting and owning. In the user cost of capital formulation, appreciation of the housing asset enters as a negative cost. The costs to the household of gross rent (as a renter) is compared with capital and operating costs less appreciation (as an owner).

In Moscow, since housing privatization is free of charge, a tenant's gain from the transfer of ownership is the full value of the unit. Unlike a household purchasing a unit, there is no expenditure associated with unit acquisition, although the privatizing tenant may have to pay for rehabilitation in the future. By comparison, in Hungary, households could effectively purchase occupancy rights. Thus, the tenant's potential capital gain must be reduced by his initial investment. There were

few cases in Moscow, however, of households who purchased the occupancy rights for a unit from another tenant under the former system. Hence, in Moscow the value of the privatized unit should be a clear and powerful determinant of the decision to privatize: those living in higher value units are expected to have a higher likelihood of privatizing.

There are other demand-side forces at work. Most notably pensioners have a special motivation to privatize. Under the regime of state provided housing, the rental contract (the *naym* agreement) gave tenants very strong rights. It was and is essentially impossible to evict them and occupancy of a unit could be willed to certain family members who were registered as living in the same unit. Those not registered, however, could not receive the unit. Hence, pensioners are motivated to privatize in order to be able to pass their unit to their non resident relations. They will privatize to "cash in" their right to will the unit to someone.

There are, however, factors that discourage privatization. As noted, extremely strong tenants' rights provide owner-like security, and reduce such gains from privatizing. In addition, if the operating costs e.g. maintenance fees and property taxes, of owning are higher than those of renting, the likelihood of privatization declines as the relative advantage of owning is diminished. The governments of the Russian Federation and city of Moscow recognized this fact and acted to encourage privatization. The Law on Privatization declares that during an undefined "transition period" those who privatize will pay the same maintenance and communal service fees as renters. The Russian Federation has a property tax, which is a local tax but with a nationally set tax rate and method of assessment. The actual parameters were set so that the effective rate on residential property is trivial (Lowry, 1992). Moreover, the city of Moscow even delayed implementing the tax until 1993. Thus, during 1992 there was no difference in the operating costs confronted by owners and renters.

The Moscow housing stock consists nearly completely of multifamily buildings and that under the privatization law any unit in any building can be privatized. Therefore, renter and owner neighbors in the same building differ in no significant respect, except that the owner has the right to sell or rent his unit freely on the market. However, presumably many households suspect that the situation of equal operating costs will not continue indefinitely and that owners are at risk some day of paying property taxes and of paying much higher fees for maintenance and communal services than renters living under the *naym* contract. These expectations may affect the privatization decision.

Operationally the effect of these various factors is to make the model actually estimated extremely simple. The model is

$$\ln [P/(1-P)] = a + b_1(\text{VALUE}) + b_2(\text{EXPECT}) + e \qquad (1)$$

where the dependent variable is the log of the odds of tenants electing to privatize his unit, VALUE is the market value of the tenant's unit, EXPECT are variables indicating the tenant's expectations about future increases in operating costs, and e is an error term.

We have also estimated a "descriptive model" to identify important household demographic and economic factors associated with the decision to privatize. The variables included in this model were selected based on a series of cross-tabulations reviewed below.

DATA AND DEFINITIONS

This section describes the data employed in this analysis and explains some of the variables created to analyze the attitudes towards and the extent of privatization among various demographic groups.

Sample Survey

The objective of the survey was to obtain information for a sample of 2000 units which were state rentals in January 1992. The primary sample was drawn by randomly selecting from a listing of residential telephone numbers provided by the Moscow Telephone Network. As of October 1992, 92 percent of apartments in Moscow (and 94 percent of urban families—the difference being attributable to communal flats) had telephones. The great majority of units without telephones is in areas of newly constructed buildings awaiting installation of this equipment. Samples were drawn of units in three of these large, new residential sites from listings of units in each. Including these areas, 95 percent of all units in Moscow were included in the population from which the sample was drawn.

The sample was restricted to state rentals by interviewer screening. Occupants were asked whether the unit met the definition for inclusion i.e. was a state rental unit in January 1992. In cases of refusal of the occupant to be interviewed, the interviewer followed instructions for selecting a similar unit in the same building, usually a unit above or below the one originally selected through the telephone listing.

A total of 2,002 interviews were completed in person in December 1992. The survey included questions on housing quality of both the flat and public spaces in the building, household characteristics including family size, occupations, and incomes, and attitudes towards privatization. These data enable us to examine which households in Moscow are privatizing their units and, furthermore, to determine a households motivations for privatizing or for not privatizing their unit.

Definitions

In order to evaluate the extent of privatization, households were divided into five groups based on their status and interest in privatization:

- **Privatizers** (those who "did")—those who have received a certificate of ownership through the privatization process, plus those who have applied to receive their unit, their application has been accepted and they are waiting for their certificate.

- **Interested** (those who "will")—those who express a strong interest in privatizing their unit, i.e., they state explicitly that they intend to privatize within the next six months.

- **Might**—those who have no plans to privatize.

- **Uninterested** (won't)—those who have no plans to privatize their units and who responded negatively to at least two out of three questions about their intentions regarding privatization of their unit if certain developments occurred, such as rents being raised by ten times or a government announcement that free-of-charge privatization would end in a year.

- **Unclear**—those who believe that in general flats in their building are not eligible because, for example, the building needs extensive rehabilitation, plus those in communal flats where the occupants of other rooms do not agree to privatization, and those who applied to privatize their unit but their applications were rejected for some reason.

The key variable in the analysis of incentives for privatization is the value of the unit. In the survey, following a screening question asking if tenants knew units similar to theirs which had been privatized, and then sold or rented, interviewees were requested to appraise the value of their flats. Answers were provided by 162 respondents. To obtain values for other units a hedonic regression model was estimated using data on units for which the respondents had provided estimates of value. (The model is presented in the Annex.) The model was used to impute unit value for the other cases.

The model estimating the odds of privatizing also incorporates the occupant's views about the importance of maintenance fees and property taxes in the decision to privatize. These views were disclosed in his/her responses to a number of questions about positive and negative factors associated with privatization. Dummy variables used in the model were created for responses that increased property taxes and higher maintenance fees for privatized units were "very important" factors in the decision to privatize. One specification creates a single variable indicating responses

of "very important" to both of the questions on taxes and maintenance fees to get an "intensity measure" of the occupant's vies on operating costs.

An important part of the analysis concerns how attitudes towards privatization vary with household income and type of family. Numerous family types can be defined from the data, since the questionnaire gathered information on everyone living in the apartment and their relation to the head of the household. Likewise, households are readily divided into income quartiles or quintiles. However, we wanted to create a comparatively small number of family groups, combining both income and type of family information. Ultimately, the ten family groups shown below were defined. We examined the income distribution (defined by quintiles) for each demographic group and then divided the group into income groups so as to have about the same share of families of a particular type in each group. The results were five demographic groups with the number of income classes for each demographic group ranging from one to three (Table 1). Note that pensioners are retired elderly persons living alone or with their spouse. Singles are non elderly singles or two unrelated individuals living together. Complex families are multigenerational or multinuclei households.

Finally, households were divided into seven occupational categories from among the eighteen options included in the questionnaire. A family's category was

TABLE 1
Family Groups: Mean Incomes and Percentage Distribution Among All Households

Family Group	Mean Household Income	Percentage of All Households
Pensioners (poor)	3,704	10.8
Pensioners (higher income)	10,479	8.1
Singles	11,104	10.6
Adults with children (poor)	5,986	9.6
Adults with children (middle income)	13,978	16.2
Adults with children (higher income)	31,085	8.2
Adult with parent (lower income)	8,103	8.4
Adult with parent (higher income)	21,048	6.0
Complex family (lower income)	8,355	9.3
Complex family (higher income)	23,676	12.7

TABLE 2
Percentage Distribution of Households by Most Prestigious Occupation of Family Member

Occupation	Percent of Households
Directors[a]	6.9
Intelligentsia[b]	12.4
Military	3.6
White collar workers	14.8
Skilled workers	19.8
Blue collar workers	18.8
Pensioners	21.5
Other	1.9

Notes
a Directors and managers of firms or state enterprises
b Skilled employees in non production industries, e.g., education, culture, science and administration

based on the most prestigious occupation of the first three family members. The categories defined, from highest to lowest prestige, are shown in Table 2. Occupation may well be more important than income in determining the tenure decision. Under the Soviet system, cash income was a poor measure of total income because of an elaborate system of special stores and price discounts for the favored. Furthermore, obtaining a good flat depended substantially on party membership and prestigious positions in the nomenclature.

FINDINGS OF THE SURVEY: WHO PRIVATIZES? WHY OR WHY NOT?

This section presents and reviews tabular information on the extent of privatization; which households have privatized their units with greater frequency; the reasons expressed by tenants for and against privatization; and, changes in the pattern of who privatized over the year.

There has been an overwhelming response to the offer of free of charge housing privatization. Almost one quarter, 23.4 percent, of the households surveyed have privatized and 26.2 plan on privatizing in the next six months (Table 3). At current rates, over half of the city's housing stock will be under private ownership by the fall of 1993. Only 9 percent of households express no interest in privatizing, leaving a

TABLE 3
Percentage Distribution of Tenants
By Privatization Status

Privatization Status	Percentage
Privatizers ("did")	23.4
Interested ("will")	26.2
Might	34.4
Uninterested ("won't")	9.0
Unclear	7.0

large percentage who have no real plans to privatize but do not express a strong disinterest.

A more telling question, however, is who has privatized among socio-economic groups and by household occupational status. Results clearly support the assertion that a large percentage of pensioners are taking advantage of privatization, as illustrated in Table 4. Of the socio-economic groups, the largest percentages of

TABLE 4
Percentage Distribution of Privatization Status
By Socio-Economic Group

	Did	Will	Might	Won't	Unclear
Pensioners (poor)	46.8	15.3	31.9	3.7	2.3
Pensioners (higher income)	42.9	25.8	18.4	6.7	6.1
Singles	17.4	24.9	38.0	11.7	8.0
Adults with children (poor	14.1	25.0	38.0	13.5	9.4
Adults with children (middle income)	14.5	28.6	37.8	12.6	6.5
Adults with children (higher income)	11.0	32.9	38.4	6.1	11.6
Adult with parent (lower income)	21.3	30.2	32.5	5.9	10.1
Adult with parent (higher income)	27.5	26.7	27.5	11.7	6.7
Complex family (lower income)	22.8	29.5	35.0	7.5	5.1
Complex family (higher income)	23.1	25.6	35.9	10.3	5.1

TABLE 5
Percentage Distribution of Privatization Status by Household Occupation

	Did	Will	Might	Won't	Unclear
Directors	24.5	32.4	25.9	7.9	9.4
Intelligentsia	30.5	30.5	24.1	7.6	7.2
Military	19.2	30.1	34.2	5.5	11.0
White collar workers	20.2	26.9	36.4	9.8	6.7
Skilled workers	10.3	25.7	43.6	11.8	8.6
Blue collar workers	15.1	26.3	41.4	11.1	6.1
Pensioners	41.1	21.1	27.1	5.6	5.1
Others	23.1	25.6	35.9	10.3	5.1

privatizers are in the pensioner categories; 46.8 percent of low income and 42.9 percent of higher income pensioners had privatized. Moreover, only 3.7 and 6.7 percent of lower and higher income pensioners, respectively, report that they will not privatize. Other groups are considerably farther behind in their rate of privatization, with high income adults living with parents in second position with 27.5 percent privatized.

Table 5 presents the breakdown of privatization status by occupation status of the household. The highest rate of privatization is, as was evidenced in the previous table, among pensioners. Excluding pensioners, however, there is a clear pattern among occupations. As expected, those in better occupations, likely to have better housing, have a high rate of privatization. Directors and managers of state or private enterprises and intelligentsia have the highest rates of privatization and highest rates of those who will privatize in the next six months. Skilled and blue collar workers not only have the lowest rate of privatization, but also have the highest percentage of those who will not privatize.

The survey also included questions asking tenants about their opinions on the importance of various reasons for privatization, and asked to rank each reason from "very important" to "not important". There is a certain degree of ambiguity about whether respondents are expressing the importance of these issues to themselves or whether they feel that these issues are generally important to most tenants. However, in either case their responses indicate the issues which are viewed as most relevant to the decision to privatize. Those responding that the specified reason was very important are tabulated according to their privatization status in Table 6. The

TABLE 6
Reasons For Privatizing:
Percentages Answering "Very Important"
by Privatization Status

Reasons	Did	Will	Might	Won't	Unclear
To will to heir	63.0	49.7	23.5	42.8	46.4
Not want to move	31.4	27.4	10.9	27.8	28.6
Easier to move	9.2	10.1	5.1	11.1	17.9
Could sell flat	11.1	12.0	5.5	15.6	16.4
Rents may increase	28.4	26.1	9.3	26.1	32.9
Possible rental income	9.6	7.0	4.5	12.8	11.4
Good investment	12.8	15.6	5.2	15.6	22.9
Control of maintenance and management	7.1	8.0	6.0	10.0	10.7
More control of rehabilitation	6.6	7.0	5.1	11.1	12.1

majority of respondents, 63 percent, expressed that the ability to will a flat to an heir is very important. Protection against having to move and increases in rents are also very important to many respondents. On the other hand, fewer respondents expressed the desire for more control over maintenance and management and rehabilitation of their flat.

Of those who "might" privatize, many stated that their decisions would be strongly influenced by changes in current housing policy. Table 7 tabulates the responses of those who "might" privatize to specific questions concerning their intentions to privatize following the indicated changes in policy. Given each policy change almost half of respondents in this category would either "definitely" or "more

TABLE 7
Percentage Distribution of Those Who "Might" Privatize
Following Specified Changes in Policy

Would privatize if. . .	Definitely	More Likely
Rent for state housing increased significantly (10 times)	28.0	12.0
No-charge privatization ended in a year	34.4	16.4
Individual contracts for maintenance were allowed	39.2	11.2

likely" privatize. That fewer will privatize if rents for state housing increased likely reflects fears that maintenance fees for privatized units might be even greater.

Reactions to reasons for privatization also vary considerably across socio-economic groups. Although ability to will the apartment to an heir is important to all households, pensioners and especially low income pensioners more consistently stated that this reason is very important. Among family types those households with higher incomes express more strongly their opinions about the importance of financial reasons to privatize. Higher income households recognize the economic benefits of privatizing such as the fact that the apartment is a good investment which could potentially provide rental income. Almost four times as many higher income households with children, compared with their lower income counterparts, respond that the ability to sell an apartment is an important factor in privatizing than those in the lower income category; more than four times as many view the flat as a good investment; and about seven times as many respond that possible rental income is very important to the decision to privatize. This pattern is consistent across all family types, except pensioners who probably do not look at privatization in the long term. This suggests that higher income households are more strongly motivated by the economic incentives to privatize than are those in the low income categories.

Tenants were also questioned about their opinions of the importance of various reasons against privatization, and asked to rank each from "very important" to "not important". Those responding that the specified reason was very important are

TABLE 8
Reasons Against Privatizing:
Percentage Answering "Very Important" by Privatization Status

Reasons	Did	Will	Might	Won't	Unclear
Property taxes	30.3	37.1	39.2	46.7	36.4
Higher maintenance fees	25.2	32.2	40.1	43.3	33.6
Responsibility for rehabilitation	11.1	17.7	21.3	24.4	17.9
Plan to move to another state unit[a]	3.6	7.8	15.2	13.9	20.0
No reason to privatize[a]	6.4	21.0	30.9	30.0	22.9
Poor flat condition[a]	3.0	6.9	13.5	18.3	21.4
Poor location[a]	2.6	6.6	8.7	15.0	12.9

Note
a These questions were asked only to those who had not yet received their privatization certificate. Note that some of the households who "did" had privatized their unit but not received certificates.

tabulated according to their privatization status in Table 8. It is evident that many are concerned with increases in property taxes, higher maintenance fees and responsibility for rehabilitation of buildings. As expected those who have not yet privatized feel more strongly about these issues.

Privatization has accelerated over time as more information became available on the market and on the future of government policies. For example, the Government has recognized the concern over property taxes and announced the postponement of the implementation of the tax on residential property. As more units are privatized and the private housing market develops, more information has become available on prices. Moreover, the scattered information available suggests that house prices have increased—although not as quickly as the overall inflation, owing mostly to the tiny number of units available on the market in the early days of the transition. The trend in privatization may also have been influenced by the simple fact that once there was a significant number of privatized units, others felt more secure privatizing.

As the monthly totals for units privatized suggest, privatization increased considerably in the last half of 1992. Of those who privatized and received their certificate of ownership in 1992, 48 percent did so in the last three months of the year. Including those who have privatized but not yet received their certificates, indicating that they applied in the last few months of the year, these figures are impressive.

Interestingly, this trend varied among demographic groups and household occupational status. Table 9 tabulates percentages of households in each of the socio-economic groups who have privatized and when in 1992 they privatized. The majority of pensioners and singles who privatized did so in the first three months, but for other groups the pace of privatization increased significantly in the last three months of the year.

Data on the percentage of those who have privatized according to household occupation by time period in 1992 show privatization among households in all occupational categories increased substantially in the last quarter of 1992.

LOGIT REGRESSIONS

While the foregoing descriptive information is of interest, it fails to address the question of what is really driving the decision to privatize. Our basic hypothesis was tested by means of logistic regression of the likelihood of privatization being significantly determined by a few key economic factors, most importantly the value of the unit.

TABLE 9
Privatization by Socio-Economic Group
And When Privatized (Month of 1992)

		Of those privatized:	
	Privatized[a]	First Nine Months	Last Three Months
Pensioner (poor)	34.3	71.4	27.4
Pensioners (higher income)	30.1	61.1	38.9
Singles	8.9	58.4	41.6
Adults with children (poor)	8.3	43.4	56.6
Adults with children (middle income)	6.5	38.5	61.5
Adults with children (higher income)	7.9	46.8	53.2
Adult with parent (lower income)	13.0	40.8	59.2
Adult with parent (higher income)	17.5	33.1	66.9
Complex family (lower income)	14.0	34.3	65.7
Complex family (higher income)	11.4	41.2	58.8

Note
a These households are only those who have already received their privatization certificates.

The logit results are presented in Table 10. Model 1 includes only value as the independent variable. Model 2 includes value and two dummy variables indicating whether or not a household considers increased property taxes and higher maintenance fees for private units "very important" to the decision to privatize. Finally, Model 3 includes value and a dummy variable indicating that the household responded that both higher taxes and maintenance fees were "very important".

The findings clearly indicate the significance of value. The higher the value of the unit, the greater the odds of privatization. The effect of an increase in value is, however, modest. An increase in value from 8 million (about the mean reported value) to 13 million rubles increases the odds by 0.15 from a mean of 0.3 (i.e., [0.23/(1-0.23)]). The models also indicate that concerns over increased maintenance fees significantly reduce the odds of privatizing, although similar expressed concerns about property taxes do not have this effect.

Despite the high statistical significance of the models, they do poorly as predictive devices. Although the overall predictions are reasonable (76 percent

TABLE 10
Results of Logistic Regression
Economic Incentives to Privatize

Independent variables		Regression 1	Regression 2	Regression 3
Value	B	3.18E-5	3.30E-5	3.24E-5
	Exp(B)	1.0000	1.0000	1.0000
	Significance	0.0000	0.0000	0.0000
Taxes	B		-0.0300	
	Exp(B)	*	0.9705	*
	Significance		0.8453	
Highfee	B		-0.5649	
	Exp(B)	*	0.5684	*
	Significance		0.0004	
Both (Taxes and Highfee)	B			-0.5175
	Exp(B)	*	*	0.5960
	Significance			0.0000
Constant	B		-1.3011	-1.3478
	Significance		0.0000	0.0000
-2 Log Likelihood:	Chi-Square	2155.0070	2129.7570	2137.3970
	Significance	0.0000	0.0000	0.0000

* Variable not included in the regression

correct), the choice to privatize is correctly predicted in only a few cases in any of the models.

The logit models were also estimated with two additional specifications for the value variable. In the first, apartment value was denominated in units of 10,000 rubles (versus 1,000 in the reported models) to reduce the spread and possibly improve the fit of the regression. In the second, apartment value was transformed into three dummy variables, each representing roughly one-third of the value distribution. Neither alternative had much effect of the quality of the fit or predictive power of the models. However, for the 10,000 ruble specification, the coefficient doubled in size (after adjusting for the scalar transformation), suggesting that the estimated magnitude of the effect on privatization may not be very robust. For the specification employing dummy variables, interestingly, only the variable for the highest one-third of the value distribution was significant (relative to the lowest one-third) suggesting that it is the highest valued units that are being privatized. This is supported by inspection of the data: the incidence of privatization in the lowest third is 22 percent, 20 percent in the second third, and 29 percent in the highest third.

These results are in line with those for Budapest, the only other location for which rigorous statistical analysis has been undertaken (Hegedus et al., 1992). Value also proved to be highly significant, although for Budapest calculating the gain the capital gain to those privatizing is more difficult because one-third of all state rentals had been obtained through payments to prior tenants for occupancy rights. In addition a variable for expectations about increases in rents was highly significant in encouraging privatization. In Hungary, those who privatize enjoy no protection from higher maintenance fees; indeed, a condominium association must be formed and a minimum share of all units in a building slated for privatization before the title for the first unit is transferred. Hence, higher rents increase the cost of renting relative to owning.

We have also estimated a descriptive logit model to clarify the economic and demographic patterns associated with privatization, based largely on the results of the tabulations reviewed in the last section. The variables in this model include: (a) households income, entered in quadratic form to capture potential non linearities; (b) age; (c) occupation; and, the extent of crowding, as measured by square meters of space for each member of the household. The final variable was added on the premise that the most crowded households would be anxious to privatize to make it easier to find a better unit in the market rather than waiting to be allocated a larger unit through the official procedures or working through an apartment swap which is often complicated (Khadduri and Puzanov, 1992).

The results are quite interesting. Income itself is not associated with the decision to privatize. On the other hand, there are definite patterns for different occupation categories: directors and members of the intelligentsia are significantly more likely to privatize relative to blue collar workers, and skilled workers are less likely than blue collar workers. This result again supports the hypothesis that under the old regime income was not the key determinant of the distribution of housing among households and that the legacy of these practices still strongly effect this distribution.

The effect of age is somewhat complicated. First, note that being a pensioner household (a single pensioner or a pensioner couple living alone) is associated with a large positive increment in the likelihood of privatizing. After controlling for pensioner households, however, the separate effect of a greater age of the husband or spouse is to reduce the likelihood. Together these results indicate that middle-aged households are less likely to privatize than their older or younger counterparts. Finally, crowding has no effect on the decision to privatize.

An interesting comparison to these results for Moscow are those reported for Budapest (Hegedus et al., 1992). A "descriptive model" was also estimated for Budapest, but the specification is rather different from the one just presented. Nevertheless, the most interesting contrast between the results for Budapest and

TABLE 11 Results of Logistic Regression: Household Characteristics

Independent variables		
Age	B	-0.2340
	Exp(B)	0.9769
	Sig.	0.0000
Income	B	5.66E-6
	Exp(B)	1.0000
	Sig.	0.6021
Income^2	B	-7.5E-11
	Exp(B)	1.0000
	Sig.	0.5867
Director	B	0.6135
	Exp(B)	1.8469
	Sig.	0.0141
Intelligentsia	B	0.8410
	Exp(B)	2.3186
	Sig.	0.0000
Military	B	0.3729
	Exp(B)	1.4520
	Sig.	0.2633
White Collar Worker	B	0.2737
	Exp(B)	1.3148
	Sig.	0.1715
Skilled Worker	B	-0.4704
	Exp(B)	0.6247
	Sig.	0.0290
Pensioner	B	0.8905
	Exp(B)	2.4364
	Sig.	0.0000
Sqmper	B	0.0025
	Exp(B)	1.0025
	Sig.	0.4726
Constant	B	-0.7342
	Sig.	0.0000
-2 Log Likelihood:	Chi-Square	2010.5100
	Sig.	0.0000

Moscow is that income is significantly associated with the decision to privatize in Budapest. This difference seems attributable to the much greater possibility in Budapest of acquiring a unit through legal payment (i.e., the purchase of occupancy rights) and the much larger share of total income received in cash (rather than in special privileges) in recent years. Together these factors have permitted households with higher cash incomes systematically acquire better housing—housing which is the most valuable to privatize under the deep discounts available to Hungarian renters. Overall, the findings for both Moscow and Budapest clearly support the idea that tenants of state housing are making highly rational decisions about privatizing their units.

ANNEX

ESTIMATION OF UNIT VALUES

A hedonic regression model including variables on housing characteristics and quality was used to estimate the value of a unit. In the survey, following a screening question asking if tenants knew units similar to their which were privatized, sold or rented, interviewees were requested to appraise the value of their flats. The dependent variable in the regression model is the value of the unit given by those who responded that they did know a similar unit privatized, sold or rented, 162 cases.

Despite this screening the resulting distribution of values included several unrealistic outliers. Where there was a clear break in the distribution, outliers were assigned the value at the break. Estimates of less that one million rubles were assigned a value of one million rubles and those over 45 million rubles were assigned 45 million rubles. For all other cases, the coefficients of the hedonic model were used to determine the value of a unit according to the following equation:

Value = (-18758.0) + (234.3 * a13r) + (88.7 * a15) + (9746.3 * a3r) -
(2351.1 * bldtype2) - (3966.5 * bldtype3) -
(2321.0 * bldtype4) - (1293.1 * bldtype5) - (3064.1 * bath) -
(5354.4 * heatout) - (8780.3 * totliv) - (4442.7 * tooheat) +
(8247.1 * center)

All independent variables included in the final model were significant at the .10 level of higher. The resulting distribution of values was normal but included negative estimates. Those below the value of the tenth percentile of the dependent variable, a plausible price for a unit in Moscow, were assigned that value, 1.5 million rubles. Variable definitions are in the table on the following page.

TABLE A.1
Variable Definitions

Dependent Variable	Type of Variable	Definition
value	Continuous	Value of the unit in thousand rubles
Independent Variables		
a13r	Continuous	Total space of the unit in square meters
a15	Continuous	Height of the ceiling in square meters
a3r	Dummy (0,1)	Single family (1), communal (0)
bldtype2	Dummy (0,1)	Brick building of the Stalin era (1), other (0)
bldtype3	Dummy (0,1)	Building of new panel construction (1), other (0)
bldtype4	Dummy (0,1)	Building of 70s design (1), other (0)
bldtype5	Dummy (0,1)	Building of Krushchev era (1), other (0)
bath	Dummy (0,1)	Toilet and bath separate (1), else (0)
heatout	Dummy (0,1)	Central heating was out in the unit for a month or more (1), else (0)
totliv	Continuous	Ratio of total space to living space in the flat
tooheat	Dummy (0,1)	Too much heat in the flat, had to open windows to regulate temperature (1), else (0)
center	Dummy (0,1)	Located in the center (1), else (0)

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