

Potential Effects of Subsidy Programs on Housing Affordability: The Cases of Budapest and Moscow

by

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Abstract

Mortgage markets are coming of age in a number of Eastern Europe and CIS countries. As they do, governments are looking to mortgage-loan associated subsidy schemes to respond to the popular demand for improved housing. This paper presents a detailed examination of the impact of two types of subsidy schemes—mortgage interest rate write-downs, both universal and income-targeted, and income-targeted down payment subsidies—on the housing purchase capacity and the potential demand for mortgage loan volume in two very diverse markets: Budapest and Moscow. An accounting model that performs detailed calculations at the household level using information on household resources (income, savings, and home equity), mortgage terms and conditions, and housing costs (unit prices plus an assortment of closing costs) was developed for the analysis. The down payment subsidy is found to be better in both markets at stimulating housing purchase capacity in terms of efficiency and the distribution of subsidies in favour of moderate-income families.

1 Introduction: housing as a public policy issue

Transition from the centrally planned economy towards the market economy has taken much longer than most observers had thought. Housing, and especially housing finance, proved to be a very complex area (Struyk, 1996; Hegedüs, Mayo, Tosics, 1997; Struyk, 2001). There were several differences in housing finance among the socialist countries; Hungary and Russia represented the two extremes. In Russia the state ownership in urban areas dominated the housing market, while in Hungary owner occupation was in the majority even in urban areas. Concerning finance, the credit sector played a marginal role in Russia, but in Hungary (especially in the 1980s) it became an important source of housing finance. The differences between Hungary and Russia were larger in terms of the typical housing indicators (tenure, housing finance, etc.) than between Hungary and any developed European countries. However, the “logic” of the operation of the housing systems in the socialist countries was similar, namely the state institutions dominated the processes (investment, allocation, credits etc.) in the sector. Even if countries in the region are in a very different situation today, following World War II they shared a common period of socialist housing systems up until the beginning of the 1990s. This fact justified using the term “East-European Housing Model” (Hegedüs-Tosics, 1996) as the origin of the present system.

In the pre-transition period, the typical financial institutions (if they existed at that time) were part of the state economy. Their “behaviour” was closer to state organizations (allocating subsidies and resources) than to market institutions. Typically, state owned banks were responsible for extending housing loans with very long maturities, low fixed interest rate regulated the size of the loan, and there were no underwriting procedures. Loans were more a type of subsidy than an actual loan; real estate developers were more a part of the state planning process rather than the real estate market.

In the 1990s several changes took place with respect to the legal and institutional framework of the housing sector and housing finance system in the region. However, in the 1990s housing did not play a “leading role” in the economies of the region, and even its social and political importance decreased. Housing finance even lost its scope in countries where it had been relatively significant (e.g. Hungary, Poland and the Czech Republic). There is currently a discussion in the literature concerning what the main factors are explaining the slow recovery of the housing sector. There are several factors that have to be considered as possible explanations:

- Lack of an efficient legal framework

- Lack of the political will to enforce laws

- Slow institutional changes, especially the role of the state in terms of the direct and indirect subsidies

- Household behaviour to accept the terms of market transactions

- Macroeconomic conditions.

Housing finance has been one of the key target areas in the technical assistance programs of the Donor Agencies, because – it was thought – that a gap between house prices and income should be bridged by an efficient market, based on a loan sector and not by subsidies. Actually, we learnt from past experiences that it can be bridged just for a “segment” of society, and the others are either without access to owner-occupied housing (in the absence of inheritance) or are forced

to go to the market rental sector. Thus, “across the board” housing subsidies are not a solution, partly because the budgetary costs are unaffordable, and partly because without mean testing it will have a regressive income effect.

Housing affordability—the quantity of housing services a family can purchase and still have sufficient income remaining for other essential purchases—has become a new political issue in the transition countries. Before the transition affordability was a question of the “price setting” in the state sector including prices of the housing services and housing units as well as the direct subsidies (Hegedüs-Tosics, 1983, Charemza and Quandt , 1990). While before the transition, the market had a limited role in the housing sector, the situation changed dramatically in the 1990s. More and more services were liberalized or privatised, and the market has become dominant with the decreasing role of the subsidies.

Affordability is a key term in the housing literature. It incorporates several economic factors in one term, such as the house price distribution, household income distribution and mean level, conditions effecting mobility, the availability and price of mortgage loans, (Quigley and Raphael, 2004). Affordability has a different meaning for the renters and for the homeowners. For owners, occupancy costs are lowered over time by tax advantages, such a mortgage interest payment deductions, inflation eroding the cost of mortgage payments, and the realization of capital gains but they are increased by significant transactions costs. For renters, the calculation is more straightforward. For both owners and renters, it is likely the long-term or permanent income will increase affordability compared with present-day affordability.

This paper focuses on the issue of the relation of affordability and the housing finance in the homeowner sector in Budapest and Moscow. Specifically, it examines how “entry” affordability, i.e., housing affordability at the time of unit purchase (as opposed to “permanent” or long-term affordability that takes factors like those just listed into account) varies with the key terms of mortgage products . It also presents a comparative analysis of the efficacy of interest rate buy downs and down payment subsidies in these two very different markets. A key feature of the analysis is the comprehensiveness of the affordability calculations and the data assemble to make them. In this respect, the analysis follows the tradition of analyses by Listokin et al. (2002) for the U.S. Importantly, the broad conclusions of this analysis are consistent for both markets.

The first section of the paper gives background information for understanding the Moscow and Budapest housing markets. The second part overviews the development of the housing finance systems in Hungary and Russia. The third part then outlines the model developed for the analysis. The fourth and fifth parts cover the analysis of potential mortgage demand and affordability in two steps: (1) affordability based on units of various target prices, and (2) the effect of the alternative subsidy programs on affordability and equity. The final part draws some policy conclusions.

2 Housing markets in Budapest and Moscow¹

Moscow has a population of 8,5 million, which stabilized after 1995. The population of the Budapest's region is 2,5 million, but it has decreased slightly in the last ten years because of a fast sub urbanization process taking place. The population in the agglomeration increased by 100,000 while the population of the city decreased by 200,000 inhabitants.

Housing investment has declined in transition countries during the 1990s, with output typically plummeting to the 30-50 percent of the 1980s level. (Kovács, 1994) Behind this trend, huge regional differences can be traced, for example, the housing output in Moscow has not decreased as much, and by 2001 it had even reached the level of 1985.

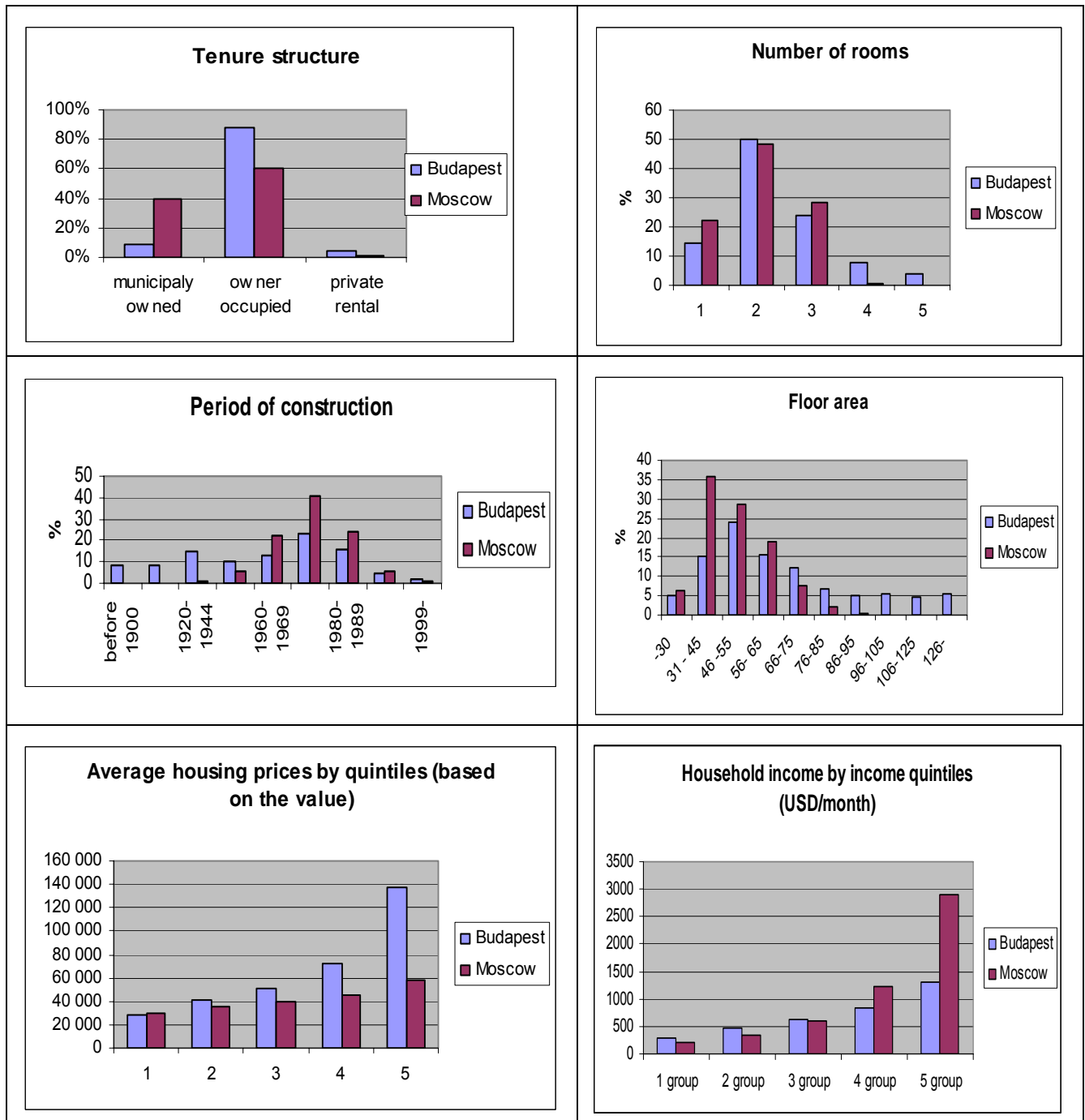
Generally in Moscow housing investment did not follow the business cycle and remained quite stable in the second half of the 1990s, thanks to municipally sponsored production. In the Budapest agglomeration, in contrast, construction slowed down. Because of the sub urbanization, the settlements around the capital grew much faster than the city. On average the level of housing investment (measured by the number of new units per 1000 inhabitants) in Moscow was almost twice as high as in Budapest. The other important difference is that in Budapest there is a cycle in investment, which is more of a "political" than business cycle: variations in construction were in response to the changes in the subsidy system rather than to changes in the economic environment. (Hegedüs-Várhegyi, 1999)

Housing remained much more subsidized in Moscow than in Budapest. As consequences of the almost "give away" privatisation in Budapest, only 9 percent of the housing stock remained public (owned by local governments), while in spite of the zero priced privatisation Moscow 30 percent of the stock is still in public hands. (Hegedüs at al, 1993) This difference is much more a consequence of the design of privatisation than an intentional difference in housing policy. In Moscow's large municipal rental sector (as well as most multifamily owner-occupied units), maintenance and operation is subsidized and full property rights are tied to legal occupancy, which means that there is no real incentive to "buy" the unit even if it is available essentially free of charge. Hungarian analyses have shown that one of the motives for buying the unit by sitting tenants was the "fear" that rents would uncontrollably increase in the future. (Hegedüs at al, 1994) In Moscow, the population does not feel this uncertainty. In Budapest, the property right to "sell" a municipal unit occupied under rental tenure is more limited. (Stuart, 2000) This shows that the legal regulations of transition were not able to get rid of the socialist model radically. But in Moscow the tenants of municipal units enjoy full property rights--they can will the unit to another occupant and can privatise and sell the unit at any time. This has situation has effects on the mortgage system as well because the renter can sell his unit and use the proceeds at a down payment.

The charts in Figure 1 highlight the differences between the two cities in terms of their housing stock, house price distribution, and the household income distribution. Budapest has higher and more dispersed housing prices and Moscow higher and more unequal incomes. These differences

¹ Moscow covers the area inside the border of the city of Moscow. Budapest includes the city of Budapest and its 78 neighbour settlements. The basis of comparison is the two surveys conducted in 2002 in Moscow, and 2003 in Budapest, described further below.

Figure 1 Comparative data for housing markets in Budapest and Moscow



Interact in complex ways to effect housing affordability.² Table 1 presents three commonly employed affordability measures for the two cities. As one might have expected, there is no consistent pattern of housing in one city being more affordable. Methodological points

² See Hancock (1991), Howenstine (1993); Malpass (1993); Hulchanski (1995) Bourassa (1996) AIHW (1997), www.nahb.org (National Association of Home Builders).

notwithstanding, the conclusion is that affordability is a very serious problem both in Budapest and Moscow according to each index.

Table 1 Affordability index in Budapest and Moscow, 2003 (measured with median values and with average values)*

	Indexes based on average values		Indexes based on median values		Comparison
	Budapest	Moscow	Budapest	Moscow	USA
House Price/Income ratio	7,7	3,2	6,6	5,8	2,8
Housing Affordability Index	57%	77%	67%	42%	136%
Housing Opportunity Index	17%	15%	11%	4%	65%

* Housing affordability index (HAI) measures the ratio of the house price a median income household can buy with a standard loan (30 % payment to income ratio, 80 % LTV) to the median house price. A value less than 100 indicates that a household with average annual income would have less than the income required to afford median dwelling price. The Housing Opportunity Index (HOI) measures the share of homes within a specific market that a typical household (family earning the median income) can afford to buy.

3 Mortgage Lending

During the nineties, because of the lack of affordable long term housing loans, housing transactions became cash-based both in Hungary and in Russia. The main reasons for the undeveloped housing finance systems were the economic crises that both countries went through, high inflation, and deficiencies in the institutional and legal systems, and the lack of effective demand on the side of households. (Buckley and Gurenko, 1996, Renaud, 1995, Struyk 2000, Dimond, 1999, 2000),

By the turn of the century, positive changes created a much more favourable environment for residential housing lending. With the improvement of the economy, the households' income situation stabilized more or less, which enabled them (at least a part of them) to make longer-term financial commitments. Inflation, and hence the interest rates on loans, decreased substantially, thereby decreasing the interest rate risk to banks of fixed-rate long term housing loans. The institutional changes included development of the market based bank system, legal changes required for the establishment and operation of new financial institution.

However, in Russia the development of housing finance system was significantly held back by the financial crisis of 1998. As a result of this crisis, many big banks, especially those that operated in metropolises, stopped lending for a period and continued their practice of originating hard currency loans when they resumed lending. Simultaneously, consumers lost their trust in banks, which meant that they were reluctant to keep their savings in bank deposits. On the banks' side, this behaviour of households just enhanced the problem of the lack of stable liabilities. The lack of long-term resources was also relevant in the case of Hungarian mortgage lending system as well; because of higher yields on other investments, households preferred to keep their savings in forms other than bank deposits.

To solve the problem of the lack of the long-term resources, both countries' policies concentrated on drawing in funds from investors through new instruments, such as mortgage bond emissions and secondary market activities. Despite the broad similarities, the present scale of mortgage lending differs in the two countries significantly. In Russia only few thousand residential mortgage loans were issued during the past 2-3 years, while in Hungary the present stock of loans is almost 300 thousand and its value equals 7 percent of GDP. Such a big difference in the scale of housing lending in the two countries can be explained in part by the different subsidy systems. During the last four years Hungary gradually has implemented a deep interest rate subsidy for housing loans (resulting in very low interest rates), while in Russia only modest subsidies are given to mortgage lending.

3.1 *The institutional structure of residential housing lending system in Russia.*

The primary operators of the emerging mortgage lending market are

- Universal commercial banks
- Federal Housing Mortgage Lending Agency
- Regional mortgage agencies

In addition, there are certain organizations, whose activities are aimed at improving the living conditions of citizens by applying various non-bank financial schemes: housing funds, construction savings banks, cooperative societies, share participation in construction financing, etc. Due to the insignificant scale of housing mortgage lending, these organizations are dominating the market at this time.

Before the crisis of August 1998, only about 20 Russian banks offered housing mortgage loans to the population. After the crisis, as noted, a number of banks suspended their activities; as the economic situation became more stable, new banks, which gradually started to mortgage lending operations, replaced them.

According to available data, in 2002 mortgage-lending services were provided by 149 credit organizations (11.2 percent of the total registered). At the same time, mortgage loans accounted only for 0.5 percent of the total volume of loans granted to the population. Consequently, long-term mortgage lending is still not a separate line of business for Russian commercial banks. The banks face several problems in the case of mortgage lending that hold back expansion of lending activity in housing finance. Credit risk is still one of the main problems that banks experience because of the legal and judicial difficulties of foreclosure, and problems with the eviction and sale of mortgaged property of mortgagors in default. Furthermore, interest rate risk is significant as well. Given the lack of confidence in the Russian economic stability, the banks, particularly those in the main mortgage markets of Moscow and St. Petersburg, still prefer to issue mortgage loans in hard currency, although this kind of loan are not affordable by the majority of the society. Banks still generally view housing mortgage lending to population or construction loans to developers as highly risky and not profitable enough. As a result, mortgage lending in Russia is being developed mostly through budget schemes and is highly dependent on the support of regional administrations.

Regarding the development of housing mortgage-lending system, a significant step was the establishment of the Housing Mortgage Lending Agency (HMLA) by the state. The Agency was founded as open joint stock company with controlling interest held by the state. HMLA played an

important role in developing standards and requirements for issuing and servicing long-term mortgage loans in order to minimize the risks and improve the reliability of the system. In 2002, the HMLA started working more actively. A new version of unified mortgage lending standards was prepared, and the Agency started to work with regional operators of the mortgage lending market on the issues of mortgage loan refinancing. The HMLA has concluded agreements with 51 regions, and 11 regions have already sold mortgages to HMLA. The HMLA also plans to implement mortgage-lending programs in cooperation with large banks.

The HMLA will attract funds through the emission of mortgage securities, although to date it sold only non-collateralised debt. Its bonds are secured by the state guarantees of the Russian Federation. The Agency plans to refinance mortgage loans pools, bought mainly from regional mortgage operators.

At the same time, many Russian regions are developing and implementing their own housing programs. For this purpose, regional mortgage lending agencies and housing funds are being established. Under these programs, certain funds from regional and local budgets are allocated for issuing loans to citizens for purchase or construction of housing. Budget funds are allocated in two different ways. The more common form until recently was subsidizing of the interest rate on mortgage loans issued by authorized banks. Another way is issuing loans for housing purposes at rates lower than those on the loan market. In the latter case, there is a special management body that organizes the issuance of preferential housing loans through an authorized bank or agent bank. Further development of mortgage lending programs in regions is associated with establishment of the market system of mortgage lending and a secondary mortgage market.

3.2 *The institutional structure of residential housing lending system in Hungary.*

In Hungary the main institutional and legal changes were implemented by the end of the nineties that made possible a more extended, long-term mortgage lending activity. As a result of the institutional development of the nineties, three main types of financial institutions participate in housing finance:

- Commercial banks,
- Mortgage banks and
- contract savings banks.

The mortgage lending activity started to grow significantly when the new housing loan subsidy system was introduced that gave interest rate subsidy to housing loans. The idea was to establish an interest rate subsidy that makes mortgage loans more available for households during the period until the inflation decreases to a level that allows for acceptable conditions for long-term mortgages. Therefore, the subsidy scheme was designed so that the subsidy declines in parallel with the fall of inflation. Two different types of interest rate subsidies were introduced: (a) an interest rate subsidy to mortgage bonds and (b) the interest rate subsidy for loans connected to new construction. The program was launched in January 2000, and the mortgage bonds have become the primary resource for mortgage loans due to their subsidization.

Until the late 1990s, the housing lending market was highly concentrated and dominated by OTP, the former state bank, and only from 1996 have other commercial banks started to enter the housing finance market. While in the case of retail lending the monopoly of OTP has shrunk substantially, in the area of housing loans OTP's share declined very little: as late as in 1997 OTP

still had nearly 90 percent of the market. Due to reasons mentioned earlier – low demand, high inflation rates, high credit risk – commercial banks moved in the housing lending market only later and with a very cautious business strategy. They were mostly following OTP's policy as a result of which there was no genuine competition between banks. The lack of competition was also felt in the slow decrease of real interest rates in housing loans. Owing to the new subsidy policy introduced in 2000, the number of commercial banks and financial institutions in the housing lending market grew considerably in the past three years. According to Hungarian Central Statistics Office (HCSO) data: 16 commercial banks, 3 mortgage banks and 179 savings cooperatives operated in the market in 2002 as a result of which the market now is less concentrated. (Kiss, 2002)

Setting up mortgage banks became possible with the enactment of Act 1997/XXX on Mortgage Credit Institutions and Mortgage Bonds. Currently there are three mortgage banks in the market: the Land and Mortgage Bank (FHB), the HypoVereinsbank (HVB, German-owned (1999)), and the OTP Mortgage Bank (2001).

The first mortgage bank, the state-owned FHB was set up in 1998. At the outset, housing lending was not central in the bank's strategy: the bank primarily targeted the upper segment of the market and did not deal with subsidized loans, which it considered not safe enough. Initially, with the introduction of the new subsidy program FHB gained a central role in housing finance--at the beginning only the FHB was entitled to receive the subsidy for mortgage bond issuance. Because the FHB was not authorized to issue its own loans, loan origination was organized in cooperation with commercial banks and saving cooperatives in the form of refinancing agreements or on a commission basis. The reason for such arrangement was to break OTP's, the former state bank's, monopoly in the market. However, later FHB's monopoly on subsidized bonds was cut back, and other mortgage banks gained the right to emit subsidized mortgage bonds. But FHB was then permitted to issue its own mortgages as well. As a result of these changes, OTP established its own mortgage bank. The current pattern of mortgage lending is that recently the FHB has refinancing agreements with nine commercial banks and issues its own loans through its five branches, while the OTP Mortgage Bank does not issue its own loans but has an exclusive refinancing agreement with OTP commercial bank. With the current arrangement OTP has regained its leading role in mortgage lending, two-third of the mortgage loans was issued by the OTP in 2002.

Although 8 percent of the households have saving contracts with the contract savings banks, these financial institutions have marginal role in housing lending. The main reason is that the conditions of their loans became less favourable with the introduction of new interest rate subsidy system. However, the contract saving banks enjoys high subsidies on the saving side.

4 The Analytic Model

The model used to estimate the loan and housing purchase capacity is an accounting-type model, using household level data. It is similar to those used in the West for similar analyses (Listokin et al., 2002) and is characterized by a comprehensive specification of the resources of potential home purchasers, the application of the detailed bank mortgage loan terms and underwriting requirements, and a full specification of closing and other transactions costs associated with unit purchase. The model is outlined in Figure 4.

The model has been designed for the purpose of evaluating the impact of various credit products on potential demand of housing generated by various types of households.

We measure the maximum capacity of the mortgage market, which is determined on the basis of household's characteristics and loan standards, according to which the mortgage lending is performed. The indicator does not include the ability of households to actually purchase the desired housing because purchasing power may be lower than dwelling prices. Therefore, it differs from potential purchasing capacity for housing. The maximum capacity of the mortgage market will always be higher than the potential purchasing capacity for homes, as a part of households will not be able to purchase the desired housing. In the model we defined for each household the potential purchase capacity given the loan product.

$\text{Potential Purchase Capacity} = \text{Potential Mortgage Capacity} + \text{Savings} + \text{Equity}$
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Obviously, the current demand for mortgage loans will be lower than the potential demand, since a major part of households, which can purchase the housing, will not purchase it "right away".³

The model is a static one, i.e. only one time period is considered. For example, the amount of a mortgage loan, which, generally, depends on all future incomes of a household, is determined in the model on the basis of all current incomes. Thus, the maximum possible amount of a home loan, calculated according to the model, does not take into consideration the fact that in future a young household's income may increase. Instead, it only reveals the capability of a household to obtain the home loan on the basis of current income and down payment.

The model applies the current prices for housing as one of input variables. We are not sure that potential demand, predicted by the model, will not affect the prices. If the demand for housing will grow, the prices for housing, most probably, will increase too, that is, a certain time should pass before the supply level will increase to the demand level. Stunted growth of the housing market supply does not allow attaining the equilibrium, which, in turn, means relative instability of prices. No doubt, the growth of prices will negatively affect the housing accessibility.

The possible impact of higher prices can be studied through simulations with the model. Specifically, the calculations of housing accessibility can be corrected taking into consideration the housing prices growing 15 to 20 percent (when the model is applied in the analysis of Moscow programs), which can be accepted as the upper limit of the prices growth, since, in near future, the amount of mortgage finance will be rather moderate.

4.1 Block 1. The Mortgage Model

Maximum amount of a home loan, which can be extended to a certain household, is determined by the mortgage lending model by taking into account the characteristics of households and terms

³ The realistic estimates for the potential mortgage demand should take into consideration the household intention to move. In Hungary 20 % of the households wants to move in the next 5 year. In the comparative analyses we did not have this information for both data sets. Thus we used the whole sample.

of the specific loan product under analysis (Figure 4, Block 1). The amount of a home loan is determined by the fixed interest annuity payment formula. It is assumed that every household prefers to obtain a home loan of maximum amount.

In other words, the block simulates a typical procedure of how the bank takes the decision on a possible amount of a home loan for a borrower while taking into consideration the characteristics of a borrower and lending terms:

When determining the maximum amount of a home loan accessible for household, the parameters as described below are taken into account:

1. Interest rate;
2. Lending period;
3. Limits of a loan amount;
4. Maximum LTV;
5. Maximum share of a loan service payment in the borrower's net income;
6. Loan extension costs: application processing payment, cost of appraisal services, broker services, notary certification and state registration services;
7. Borrower's property, life and disability insurance costs;
8. Borrower's age limits;
9. Borrower's credit history;
10. Availability of a down payment and/or interest rate subsidy.

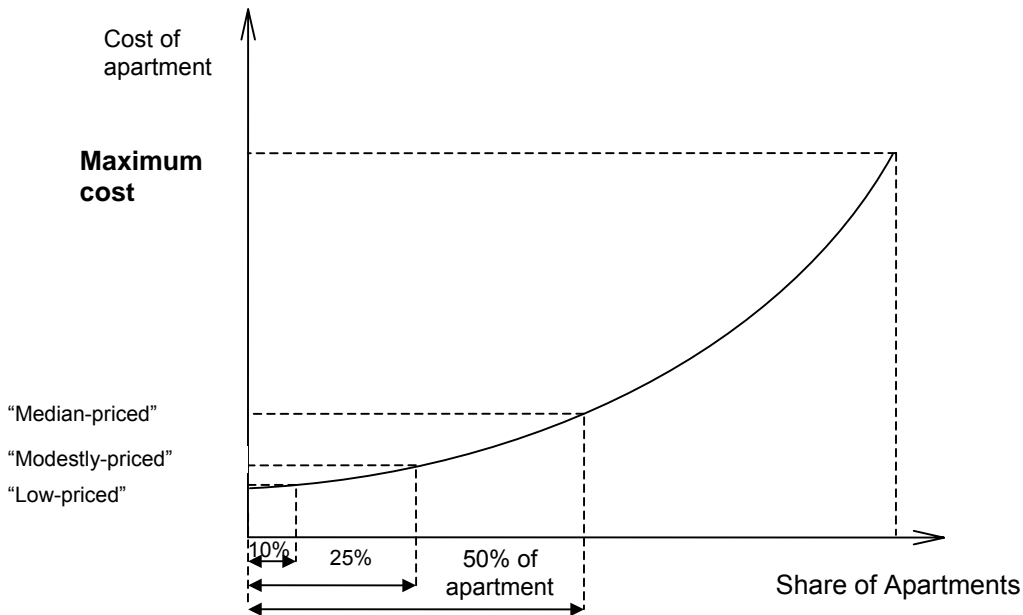
The mortgage-lending model also gives additional indicators of market capacity for every mortgage product, for example, aggregate cost of housing, which a household could have purchased by using the mortgage product. (See data description in Appendix.)

4.2 Block 2. Housing Affordability Analysis

To evaluate the housing purchase accessibility for a household, it is necessary to determine what housing may be considered targeted for a household, that is, what housing the household could move to. Following the analysis by D. Listokin et al., several housing “target prices” were defined.

- “Median-priced” housing – cost of apartment is 50-percent “point” for apartments distribution;
- “Modestly-priced” housing – cost of apartment is 25-percent “point” for departments distribution;
- “Low-priced” housing – cost of apartment is 10-percent “point” for department distribution.

Figure 2 Distribution of apartments by cost



So the maximum amount that the household can afford to purchase a housing unit (see Block 1 in Figure 4) is compared with different indicators of “target” housing to determine the household’s housing accessibility.

In practice, to take the decision on whether to move or not, the household must compare the related advantages and disadvantages of the move in terms of expenses (Smith et al, 1988).⁴ If the disadvantages (expenses) exceed the advantages, which are minor, the household may take the decision on not moving to a new housing unit. If one assumes that advantages are proportional to the difference in the cost of the purchased dwelling and the current dwelling, then an additional condition should be introduced to correct the accessibility of a housing unit purchase for a household: if a difference between purchased and sold housing does not exceed certain given value (e.g., 25 percent), then the household will give up the idea of moving.

Following the results of comparisons performed, all the households are divided into 4 groups (See Fig. 3):

⁴ See, for example, extensive survey on the housing market models by Smith, Lawrence B., Kenneth T. Rosen, George Fallis, in *Recent Developments in Economic Models of Housing Markets*. Journal of Economic Literature, Vol. 26, No. 1 (March 1988), pp. 29-64. **format for this reference is wrong; move full reference to the reference list**

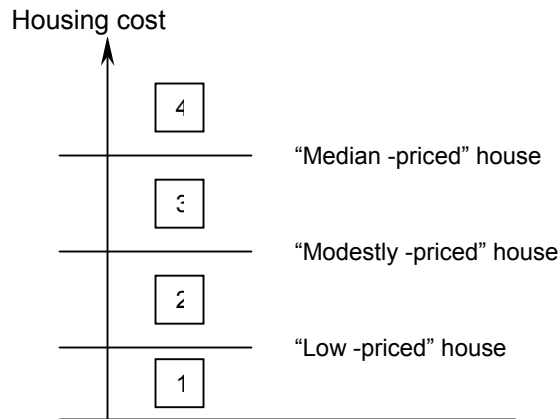
Households that can not purchase “low-priced” housing;

Households that will purchase “low-priced” housing but cannot afford purchasing “modestly-priced” housing;

Households that can afford purchasing “modestly-priced” housing but cannot purchase “median-priced” housing;

Households that can afford purchasing “median-priced” housing.

Figure 3 Categories of households in terms of housing market accessibility



The accessibility results can be analysed for different household characteristics, such as, for example, the income distribution. **4.3 Block 3. Evaluation of Subsidies Efficiency**

The block is applied to perform the additional analysis of the mortgage products, which require budgetary funds to provide the subsidies. The subsidies can be provided to make the down payment (as a fixed sum or as a percentage of the housing cost) or to reduce the cost of a home loan (as an interest rate subsidy).

The block evaluates costs and benefits of subsidies to borrowers for unit purchase. In case of an interest rate subsidy, subsidies are computed on a present value basis over the life of the subsidy. To evaluate the benefits the model computes the number of households that can afford better housing, as compared with old housing. Special attention is paid to the subsidy impacts on the accessibility of for low-income households, i.e., those in the lowest 30 percent of the income distribution.

4.4 Analysis Structure

We focus on the comparison of the Budapest and Moscow markets for two groups of households:

1. We assumed that every nuclear household who owns its apartment could trade up. Moscow renters of municipal housing are treated as owners since they can privatise their units at any time. We call it a “trade-up” option. The emphasis here is on the direction and relative size of the effects caused by the changes in loan terms. Households are assumed to trade up if they can improve the value of their unit by a minimum of 25 percent.

Twenty-five percent seems to be a minimum, and probably the actual market “leap” is bigger than that because of the high transaction cost. In the reality, the relative price of the newly bought unit depends on expectation, etc. The Hungarian studies indicate that the price differences are higher between the new home and the home being sold to finance the purchase of the new one than it was supposed in the comparative analyses. In 1992 a Hungarian vacancy chain study showed that the difference was 68 % of the unit sold. In 2001, in a small Hungarian city the difference between the expected new home and the actual one was 150 % and in a recent survey of the loan application the average difference was 100 %. However, if we consider the renewal a kind of transaction, the 25 percent could be more acceptable. In the Hungarian survey 23 % of the households who wanted to change their housing situation planned to renew, extend their home. They need credit as well, but in their case the 25 % value gap is probably very close to the reality.

2. For households who are renting in the private market or who have “complex” or multigenerational families, the model did not allow “selling” their units. Every household in this group has to move into a new dwelling without the possibility of selling the existing housing unit. This is the “first time buyer” option. In multigenerational families living in a small unit, one part of the household would move out (“splitters”). In housing markets with a low level of mobility like in Hungary, the share of households who move together (trade-ups) could be lower (around 35-45 percent) than in a market with high mobility (65-75 percent).

In the comparative analysis, we study the loan products and subsidies separately for trade-ups and splitters.

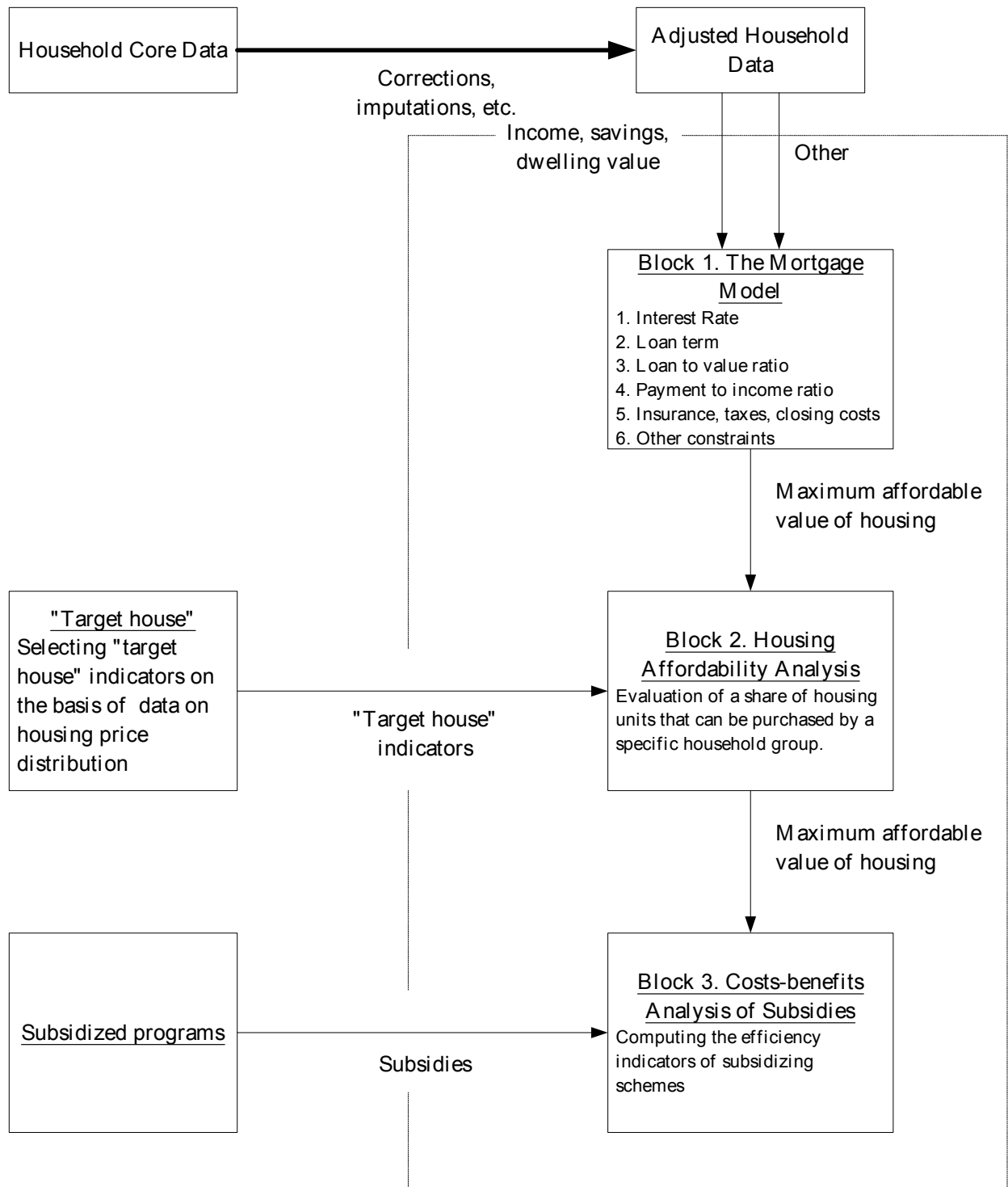


Figure 4 Structure of the model

5 Affordability Patterns

In the comparative analysis we focus on the effects of the interest rate and the maximum **LTV** ratio on the share of the households who would be eligible to take loans. The standard mortgage loan product described in Table 2 was selected as the base case. We tried to use parameters, which are close to the reality in both markets. Market interest rates are quite close, though in Hungary a deep interest rate subsidy buys down the effective rate to 6-7 percent. The selected interest rate represents a “kind of averages” to make comparisons possible.

The affordability analysis is based on the purchase capacity (loan plus savings plus price of a home if it can be sold) to buy the “target priced” home. Several analyses (for example, Listokin, et al., 2002) assume that the type of “target unit” relies on the household’s preferences. This assumption appears to be rather realistic. There are different options to set up the target prices based on recent mover surveys or the households’ preferences. The comparative analyses uses only target house indicators that are common for all types of households. It was not possible to define the target prices for households based on their expectations.⁵ We defined different target prices for the whole market and tested how many households would be able to buy these homes. Three options were tested:

- Median priced house (50 percentile of the housing price distribution)
- Modestly priced house (25 percentile of the housing price distribution)
- Low price house (10 percentile of the distribution).

The target prices represent different cutting points in the distribution of the actual transaction prices in the market, not the price distribution of the stock. In this sense an important question is the distance between the target prices (those for units on offer) and the stock prices. In the Budapest market this is much closer than in the Moscow market, which reflects the different demand elasticity of the markets.

Table 2 The standard loan product used in model and the actual typical loan product’s parameters in Budapest and Moscow

Characteristic	Unit	Model	Budapest	Moscow
Interest rate	% per year	15	9	12-15
Loan term	Years	15	15	10-15
Limitation of the minimum amount of a loan	Thousand \$	5	4,7	5
Limitation of the maximum amount of a loan	Thousand \$	no	None	200
Loan to value ratio	%	70	50	70

⁵ In the Hungarian survey, special questions were asked about housing expectations, so we could define the target prices. Actually the respondents who indicated that in the next 5 years they want to move were asked about the type of housing they would seek to occupy, and even the probable price was asked. Thus, in the Hungarian part of the full report we used this data as well.

Payments to income ratio	%	30	30	30-40
Money paid to an appraiser for assessment of the property value and issuance of an appraisal report	\$	100	120	100
Costs of real broker services and notary certification	% of housing value	6,5	1	6,5
Annual mortgage property insurance, title risk insurance and borrower's life and disability insurance payments	% of loan amount per year	0,17	0,18	1,65
A state tax paid for the state registration of the mortgage agreement	\$	10	30	10
Lower limit on the borrower's age (at the date of application)	Full years	18	18	18
Upper limit on the borrower's age (at the date of application)	Full years	55	55	55
The minimum gap in dwelling values required for purchase	% of ex. housing value	25	25	25

Trade-up option

In the case of the standard loan product, in both Budapest and Moscow more than 50 percent of households can buy the low-priced dwelling (Table 3). It is interesting to note that while loan affordability—the share of households who qualify to take a loan—is more favourable to the households in Moscow, house-buying affordability is greater for households in Budapest. This means that in Moscow 15 percent of the households are eligible to take loans, but they are not able to buy even the low priced units. In the case of Budapest only 6 percent of the households with loan affordability are not able to buy the target house.

In Budapest if somebody can buy a cheap unit he usually can buy the median priced units. (The difference is less than 5 percentage points.) In the case of Moscow, the difference is much higher: 12 percent of the households can buy the low-priced unit, but not the median priced.

Table 3 Affordability of the trade-up option, standard loan product (%)

	Budapest	Moscow
Loan capacity (share of hh)	60,2	66,5
Share of households that can buy		
Median-priced dwelling	49,3	40,4
Modestly-priced dwelling	53,4	50,8
Low-priced dwelling	54,1	52,4

The question now addressed is how affordability can be influenced through the characteristics of the loan products. Our analysis tested the effect of changes in the interest rate and the LTV (Figure 5). We conclude that in the trade-up option purchase capacity is more sensitive to the interest rate changes than

to LTV changes. The reason for this is that for the majority of households the constraint on increasing the purchase capacity was their ability to pay the debt service and this is influenced by the interest rate.

The access to loans depends on distribution of the income and wealth (“savings”) among households. The degree of income inequality in the two markets is very different, with corresponding effects on the pattern of affordability. This point is driven home by the charts in Figure 6. The share of low-income households among potential homebuyers in Moscow declines very rapidly as interest rates increase from very low levels, and is generally lower than in Budapest. There are striking and consistent differences in the Gini coefficients between the two cities for both the number of borrowers and the volume of loans by income group, with Budapest have much a much greater degree of equality.

Figure 5 Effects of interest rate and LTV on affordability (trade-up option)

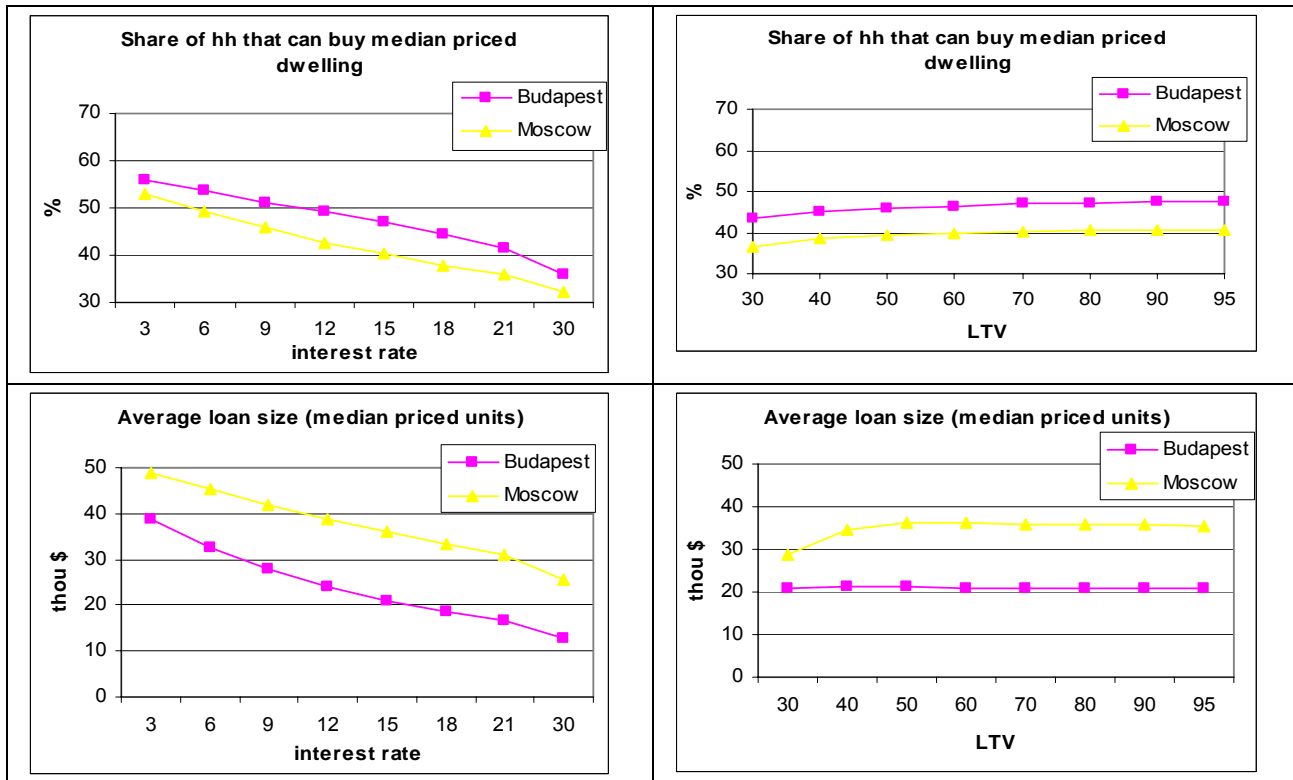
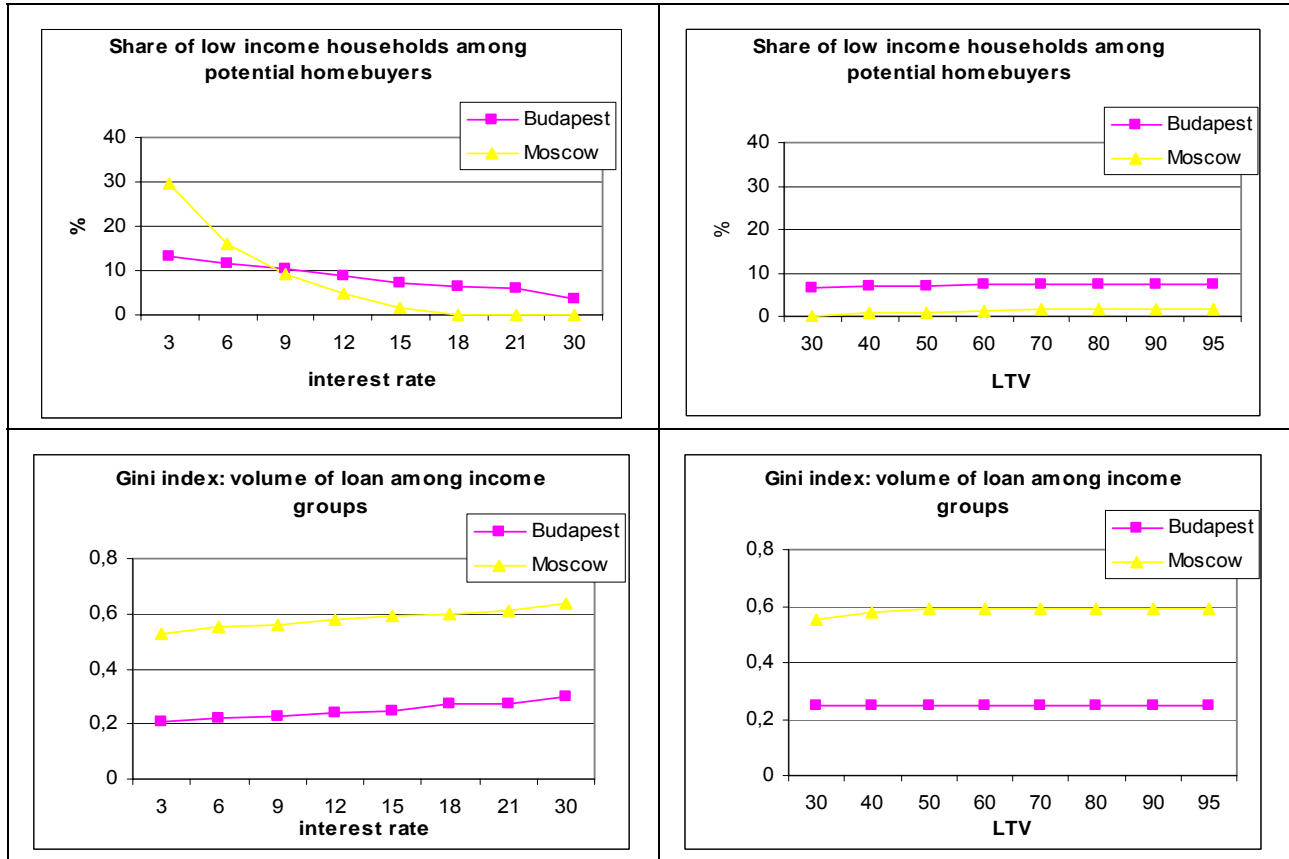


Figure 6. Effects of interest rate and LTV on affordability – lower-income households (trade-up option)



Affordability analyses of the type employed here are sensitive to the target prices and to the “behavioural rules.” We supposed that households move if they can afford a new unit more valuable than the existing one. However, we set the rule that the new unit should have a higher value by 25 percent, that is, if the “value gap” is equal to 25 percent. If we increase the value gap to 50 or 75 percent, the potential purchase capacity decreases substantially as shown in Table 4.

Table 4 The effects of the “value gap” on affordability (standard loan product)

	Budapest			Moscow		
	Value gap=25 %	Value gap=50 %	Value gap=75 %	Value gap=25 %	Value gap=50 %	Value gap=75 %
Share of households that can afford a loan, %	60,2	60,2	60,2	65.9	65.9	65.9
Share of households that can buy dwelling, %						
Median-priced	47,0	21,5	7,0	35.4	27.9	21.5
Modestly-priced dwelling	51,4	23,0	7,4	45.4	31.0	22.5

Low-priced	52,2	23,6	7,9	47.3	31.1	22.5
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With a value gap of 50 percent, half of the households who were able to buy a dwelling with a loan, saving and using their assets accumulated in the existing unit can purchase a unit, with a price 50 percent higher than the existing unit. With a 75 percent value gap, the effect is more dramatic, only 8 percent of the households can afford the target price. The actual price of the target home will be higher than the median price in 87 percent of the cases.

First time buyer options

With the first time buyer option, the interpretation of the affordability figures is clearer than for the trade-up option. The share of households who can buy the median priced dwellings is very close to those shown based on standard affordability indexes applied in international analyses. We examined the share of households that can afford to buy different target priced units. The difference from the international analyses is that we used a mortgage model to estimate the buying capacity.⁶

Table 5 Affordability first time buyer option, standard loan product (%)

	Budapest	Moscow
Loan capacity (share of hh)	52,2	50,1
Share of household that can buy⁷		
Median-priced dwelling	11,7	15,1
Modestly-priced dwelling	20,4	19,0
Low-priced dwelling	26,2	22,9

In Budapest 26 percent of the households can buy low-priced units, in Moscow 23 percent. Affordability here is very sensitive to the target price (Table 5). In the case of the median priced unit the affordability is much lower, and more so in Budapest than in Moscow. Thus, in the case of first time buyers, only 13 percent of the households can buy median priced units in Budapest, and 15 percent in Moscow.

As anticipated, the affordability of first time buyers is more sensitive to minimum LTV requirements than to the interest rate, as shown in Figures 7-8.

⁶ The index uses the median household income, 80 percent LTV ratio, and 30 percent payment value ratio.

⁷ Figures show the highest value unit each group can purchase.

Figure 7 Effects of interest rate and LTV on affordability (first time buyer option)

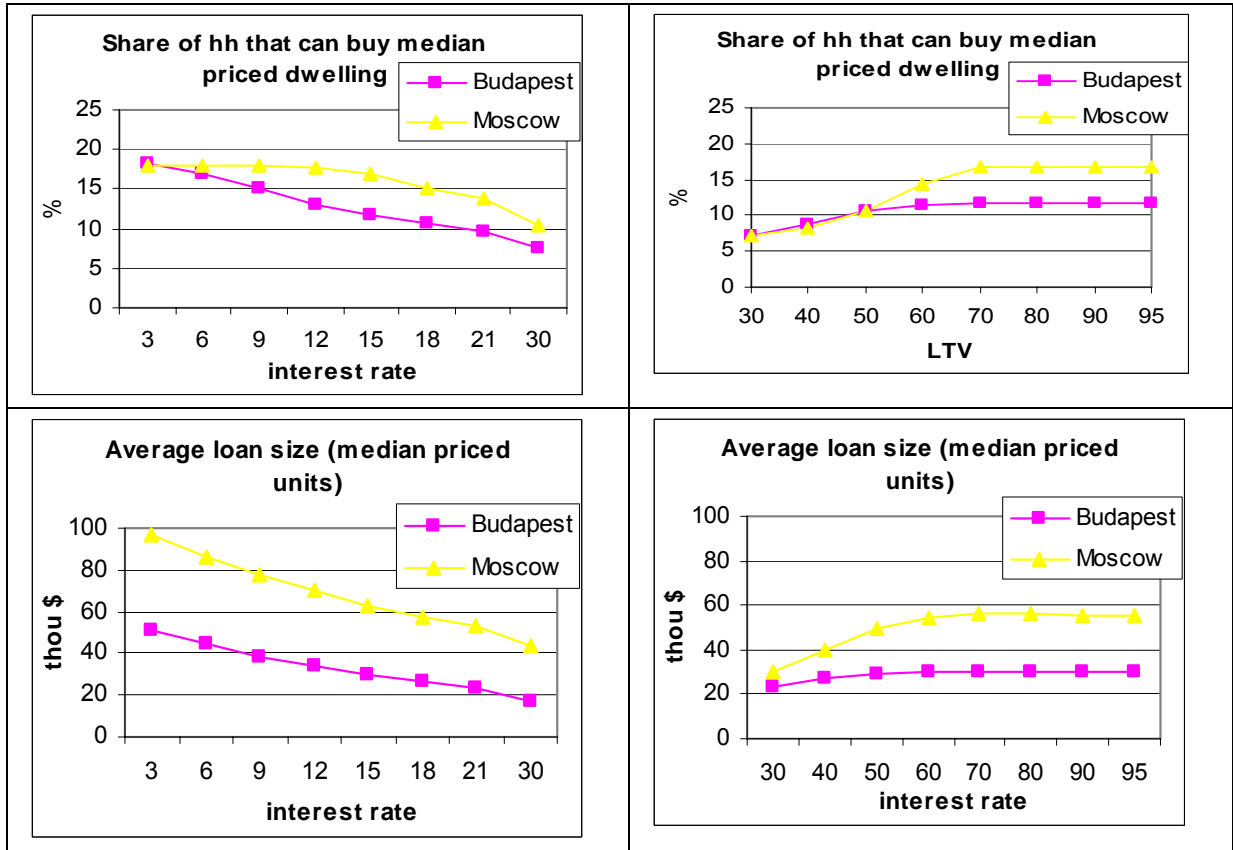
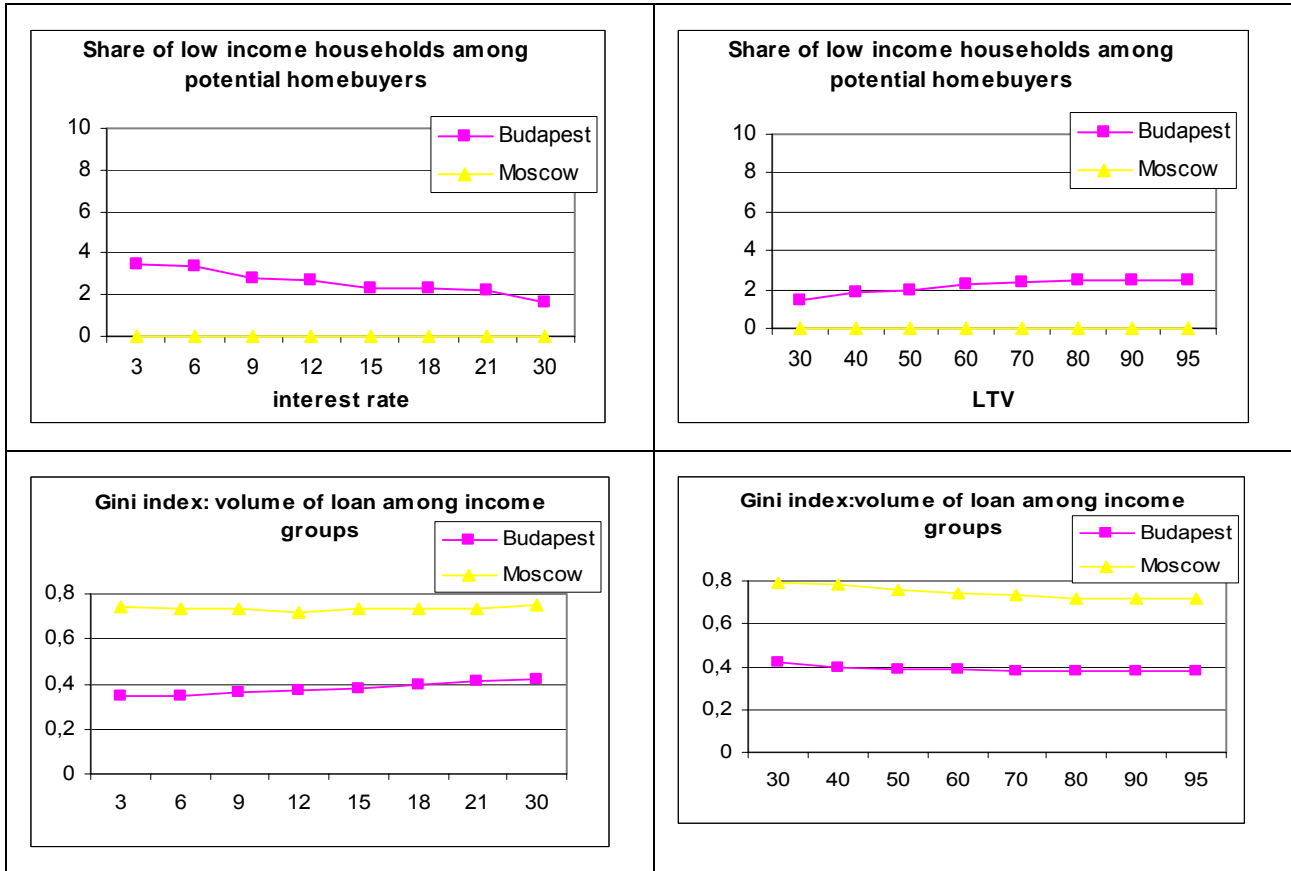


Figure 8 Effects of interest rate and LTV on affordability of lower income households (first time buyer option)



6 Effects of the subsidy programs

We examine the possible effect of the three subsidy schemes shown in Table 6 on housing affordability. The first one is an interest rate subsidy—the buy down in Cell A, which is very similar to the present Hungarian model, where the effective interest rate is decreased by a constant rate (9 percentage points).⁸ The other programs are a targeted interest rate buy down (defined in the note to the table) and a down payment that provides the same subsidy to households as the targeted interest rate subsidy, computed on a present value basis. The upper income group (30 % of the households) are excluded from the subsidy. Households belonging to the lower 70 percent in the income distribution are entitled to a subsidy between the range of 9% and 1 % proportional to their income.

⁸ The market mortgage interest rate was 15 percent in both markets (2003 summer).

Table 6 Types of subsidy programs tested

	Interest rate subsidy	Upfront cash subsidy
Flat interest rate subsidy no income or household criteria	A: flat 9 % interest rate subsidy, only constraint is the maximum amount of the loan	
Income criteria	B: Interest rate subsidy, where the subsidy (rate reduction) is defined by as a function of per capita income	C: Upfront cash subsidy equal to the present value of the subsidy given under the B scheme

We examined the subsidy impact only for households with the trade-up option, because the sample sizes for first time buyers who qualify for the programs are quite small and the results tend to be volatile to the reclassification of a few households. The programs have different effects on the affordability depending on the structure of the market. The effect of the Subsidy program A is basically the same as the effect of the interest rate decrease from 15 percent to 6 percent. As a consequence, the share of households that could afford to buy the target dwelling increases by 5.1 percentage points in Budapest, and 10,9 percentage points in Moscow (Tables 6 and 7). This increases housing purchase capacity by 10.5 bln USD in Budapest and 40.2 bln USD in Moscow.

Table 7 The effect of alternative subsidy programs on affordability, Budapest (trade-up option)

	Baseline	Change from baseline		
		Subsidy A	Subsidy B	Subsidy C
Share of households that can buy dwelling, %	52,2	5,1	2,0	3,1
Target price				
Median-priced house	47,0	6,6	2,2	3,4
Modestly-priced house	4,4	-1,1	-0,3	-0,3
Low-priced house	0,9	-0,4	0,1	0,1
Purchase capacity analyze				
Potential purchase capacity for houses, bln. \$	59,9	10,5	2,4	3,8
Potential demand for mortgages, bln. \$	10,1	7,4	1,2	0,3
Potential demand for subsidies, bln. \$ (PV)	0,0	9,8	1,4	1,4
Subsidy equity				
Share of hh receiving subsidy, % of hh can buy house		100,0	60,8	60,6

In Program B the total present value of the subsidy is much less, because the rich households are excluded, and only households belonging to the lowest income group are eligible for the “deep”

subsidy. Thus, only 60.8 percent of households in Budapest, and 53.5 percent in Moscow are eligible for the subsidy.

We can measure the relative efficiency of the programs through an indicator which compares the result of the subsidy program—defined as the increase in housing purchase capacity or the increase in mortgage demand—to the present value of subsidy costs. As shown in Figure 9, Program B is more efficient than Program A because it increases affordability relative to the present value of the subsidy. With a subsidy of only 13-15 percent of that of Program A, the increase in affordability (to compare to the baseline version) is more than half of the Program A’s effect. Program C appears even more efficient.

Table 8 The effect of alternative subsidy programs on affordability, Moscow (trade-up option)

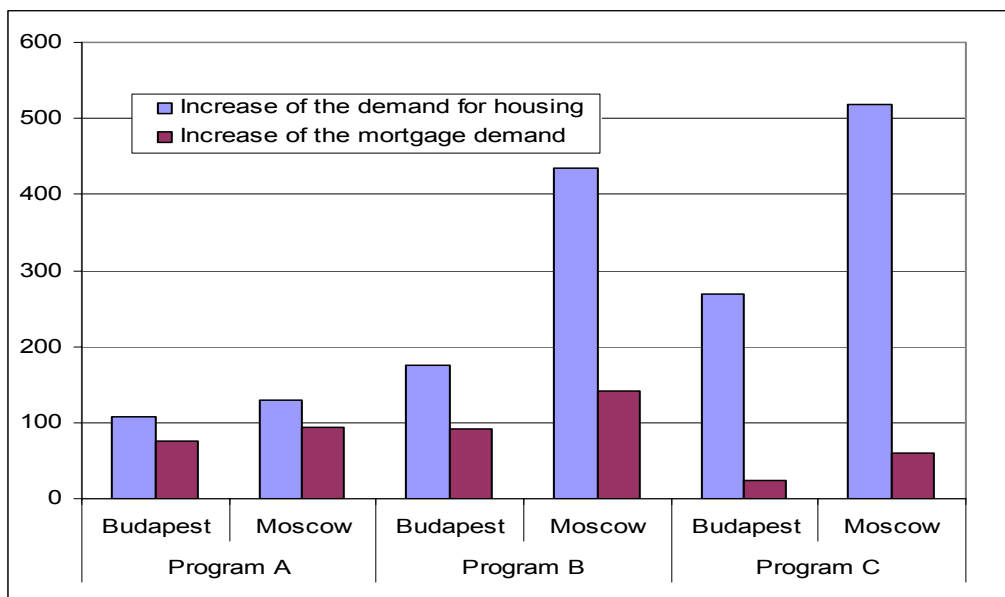
	Baseline	Subsidy A	Subsidy B	Subsidy C
Share of households that can buy dwelling, %	52,4	10,9	8,7	10,7
Target price				
Median-priced house	40,4	8,9	5,7	7,5
Modestly-priced house	10,4	1,7	2,5	3,1
Low-priced house	1,6	0,3	0,4	0,2
Purchase capacity analyse				
Potential purchase capacity for houses, bln. \$	137,8	40,2	15,6	19,7
Potential demand for mortgages, bln. \$	44,9	28,9	5,1	2,3
Potential demand for subsidies, bln. \$ (PV)		30,9	3,6	3,8
Subsidy equity				
Share of hh receiving subsidy, % of hh can buy house		100,0	53,5	55,0

The simple reason why Program B is more efficient than Program A is that it gives more help to households who are in need (lower income and savings), and does not give a subsidy to households who have already reached their loan capacity. The issue here is what are the constraints to increased affordability. Programs A and B can not help the households who are facing “down payment constraints”. Here Program C is more efficient, because it gives a cash subsidy to households with low savings. Overall, in both Budapest and in Moscow, Program C is the most efficient increasing housing demand, with Program B next, followed by Program A.

If we measure the effects of the programs on the demand for loans, there is an important difference: while Program C increases housing purchase capacity more than Program A or Program B, it generates less demand for loans. This is because the subsidy is an upfront subsidy. It helps households meet the minimum resource requirements to purchase a unit but does not increase their capacity to service a mortgage loan.

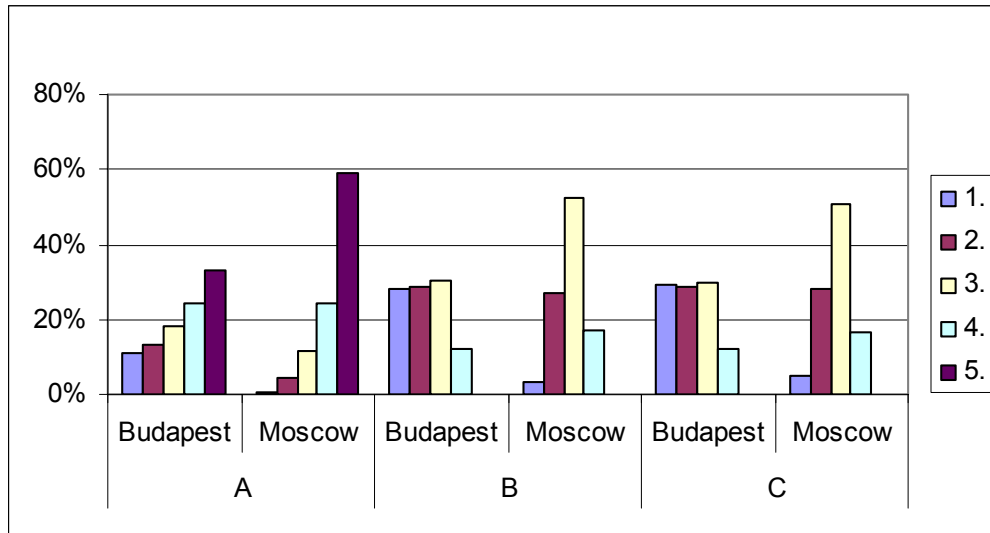
In the Hungarian political discussion, the banks were much more interested in the interest rate subsidy than in moving towards a cash-based subsidy. Their argument was that housing demand would rise as interest rates go down, but they did not take into consideration the lack of savings as the main constraint on increasing the number of loans.

Figure 9 The effects of the subsidy programs on the purchase capacity for housing and loans (as relative to 100 USD subsidy)



The distribution of subsidies among income groups is very important as well. Programs B and C have largely the same effect, because they are both means-tested schemes. The difference is huge between their effects and those of Program A, where households in the higher income quintile receive the largest share of subsidies (Figure 10). Interestingly, even Program C does not result in a progressive subsidy distribution. In the case of Budapest, as a consequence of means testing the subsidy, the first three income quintiles receive the same share of the subsidies. One might expect that lower income groups would have more subsidies according to the program rules. But this is not the case because among the low-income households the share that cannot afford the median priced house—even with the subsidy—is higher than among the next higher income groups who receive lower subsidies per family. Households belonging to the fourth quintile have less chance than the first three, and the fifth is out because of the means testing. In Moscow, among the first three income quintiles the difference remained regressive (the higher the income, the greater the subsidy) because the greater income inequality so limits borrowing capacity.

Figure 10. Allocation of the subsidies among the income quintiles



7 Conclusions

This analysis has explored the potential effects of mortgage characteristics on potential housing and loan demand. The research gives insights into the problems housing policy makers face when they want to increase the role of the mortgage system in stimulating housing demand. However, the analysis did not aim to “forecast” the actual housing market impact of alternative policies. One would need a dynamic model for that, while ours is basically stationary and designed for analytical purposes.

The policy advice based on our research on the superior way to support long-term borrowing is to select the downpayment option (Program C). The interest rate subsidy buy-down program (Program A) gave a 9 percent (flat) interest rate write down, which helped the trade-ups and those first time buyers with high family savings. But additionally, it gave incentives for households with savings to invest in housing without real housing needs; the program also risked producing substantial house price increases, which would worsen the affordability for the majority of the population. The targeted interest rate write-down (Program B) would have better results in terms of the equity issue; but from an efficiency perspective, the downpayment subsidy scheme (Program C) is better in these two diverse housing markets in efficiently stimulating housing demand.

We conclude that the main constraint on the affordability is the lack of savings. In reality, however, the households’ cash requirements have been partly bridged by intrageneration transfers. This means that households who do not have family background are in a hopeless situation, and the social support would ideally target this group. The problem of the cash subsidy program is the difficulty of the targeting; especially in countries where measuring income is difficult. One alternative to address the downpayment problem is to increase the LTV ratio up to 90 percent and provide support to banks through a special mortgage guarantee program.

8 Appendix: Data description

The core household data are from two surveys conducted by the Russian and Hungarian national statistical agencies (see notes at the end of Table 9). The Moscow survey (GKS) had a sample size of 1,380. The Budapest survey had a sample size of 2,148 as a sub-sample of the 2003 National Housing Survey made by the Central Statistical Office (CSO). Household income data for Moscow were adjusted from reported values using factors provided by the national statistical agency; for Budapest household incomes were also corrected. The house price data for Moscow were imputed based on real estate surveys and hedonic models; in Budapest respondents’ estimates were corrected through hedonic price function. Savings data were in both countries imputed using macroeconomic data, and a distribution function.

Date sources and definitions are summarized in Table 9. After the table is some discussion of variables where imputation or corrections were necessary.

Table 9 Data Sources for variables used in the model

Variable name	Description	Source	
		Budapest	Moscow
Household characteristics			
Hhsize	Household size	CSO	GKS
Age	Age of each household member, in full years	CSO	GKS
Relations	Relation of each member to the head of household (i.e. wife/husband, son/daughter, etc.)	CSO	GKS
Income	Total net monthly income of a household	CSO data were adjusted ... HOW????	GKS, adjusted by official statistics on population distribution by income
Ssav	Total households savings (stock variable)	Inputted using function of saving as characteristics of households	Imputed using experts estimates
Crhistor	Credit history of household	CSO (imputed by question on arrears)	Imputed using GKS data on delinquencies in utility and rent payments
Bigfamd	Is household complex (i.e. consists of many generations)?	CSO	Imputed using GKS data
Intmoved	Does household have an intention to move?	CSO	Imputed using GKS data
Weights	Sample weights	CSO	GKS
Household dwelling characteristics			
Ownst	Who is an owner of housing?	CSO	GKS
Esprice	Value of an dwelling occupied by household	CSO (Hedonic price estimates based on respondents valuation)	Imputed using hedonic price regression
Mortgage product profile			
Lrate	Yearly interest rate, %	Bank information	Banks public

			offers
T	Time to maturity	Bank information	Banks public offers
Loanmin	Minimum available loan size	Bank information	Banks public offers
Loanmax	Maximum available loan size	Bank information	Banks public offers
ltv	Loan to value ratio (%)	Bank information	Banks public offers
c1	Payments to net income ratio (%)	Bank information	Banks public offers
Applcost	Loan execution costs	Bank information	Banks public offers
Apprcost	Costs of property appraisal services	Bank information	Appraisals public offers
Brk_cost	Costs of real broker services and notary certification (% of dwelling value)	Bank information	Real brokers and notaries public offers
Insrates	Annual property and life insurance payments (% of loan amount)	Bank information	Insurance companies public offers
Ntr_cost	Other one-time expenditures on mortgages (% of loan amount)	Bank information	Banks public offers
Regcost	Costs of state registration	Bank information	Banks public offers
Tran_cst	Transaction tax (% dwelling value)	Banks public offers	Banks public offers
Agemax	Maximum allowed borrower's age at the date of application	Bank information	Banks public offers
Agemin	Minimum allowed borrower's age at the date of application	Bank information	Banks public offers
Hmarket	Which type of housing market it is allowed to buy a dwelling unit on?	Bank information	Banks public offers
Valgap	The minimum gap in dwelling values required for purchase	Imputed	Imputed
Target prices			
Tgprice1	Price of a "median-priced" home	Imputed basing on market prices	Imputed basing on market prices

		distribution	distribution
Tgprice2	Price of a “modestly-priced” home	Imputed basing on market prices distribution	Imputed basing on market prices distribution
Tgprice3	Price of a “low-priced” home	Imputed basing on market prices distribution	Imputed basing on market prices distribution
Subsidies profile			
Subs_dum	Is household eligible for a subsidy?	Housing subsidy scheme	Housing subsidy scheme
Subs	Downpayment subsidy (% of dwelling unit)	Housing subsidy scheme	Housing subsidy scheme
Subsls	Downpayment subsidy lump-sum)	Housing subsidy scheme	Housing subsidy scheme
Subsir	Interest rate subsidy (% points)	Housing subsidy scheme	Housing subsidy scheme
Discont	Discount rate (%)	Inputed	Longest government bond maturity – Ministry of finance

CSO – Central Statistical Office, national household survey, 2003

GKS – State Statistics Committee (Goskomstat), Moscow subsample of national household survey 2002.

Income

Russia

The comparison of the income distribution for sample households with the GKS statistics on the distribution of per capita income in January – December 2002 made it possible to conclude that the sample mostly represents households with low and mid incomes. However, according to the GKS 70 percent of Moscow households also have incomes falling within the same income range, up to RUR 11,000 (\$364) per month.

Following the GKS method of adjustment of income distribution the survey results were corrected for “other” (also known as “hidden”) incomes (Velikanova and Kolmakova , 1996). This made it possible to correct the income statistics of the sample so that to bring it in consistency with the GKS distribution statistics.

Strictly speaking, we are unable to reproduce the GKS's adjustment technique since the methodology is not published in details, but we know that it used the same survey to produce the aggregate statistics on economic indicators.

Budapest

Household survey income data. CSO corrected the reported income by the predicted income data based on regression analyses. Missing cases substituted by the regression results made by CSO.

Income corrections to measure the welfare

[WHERE IS THIS USED IN THE ANALYSIS? I THINK THIS SECTION SHOULD BE DROPPED]

To measure the welfare of a household, its income and expenditures are to be indexed in accordance with its size (World Bank, 2000). The scale effect may be manifested in different ways. For example, the scale effect is manifested when a household bear joint expenses: rental, public utilities, car, and subscription to newspapers. Age and gender of family members, apart from the family size, also have impact on the income or consumption amount which is required for a household to reach a particular living standard. Thus, the expenses for tender-years children are lower than those for able-bodies adults.

To take into account the scale effect, it is recommended to replace the family size variable for family equivalent size variable. The family of equivalent size 2.5; must spend 2.5 times as much money as compared with a single adult to be at the same level of well-being. Generally, the scale of equivalence includes both the age and the number of family members.

More is the pity that there is no common approach to calculating the equivalency scale (Deaton et al, 1996). So, certain methods are applied, every method has particular disadvantages (World Bank, 1997).

Within this analysis, we use the scale as applied in Armenia, as it takes account of the specifics of former USSR, and demonstrates the data acquisition procedure (Brown, 2003)

The weighted family size is evaluated as a sum of weights of family members.

Table 10. Equivalence Scale

Family member	Weight
Person 1 - householder	1
Person 2:	
- Adult	0,8
- Retiree or child	0,7
- Tender-year child	0,6
- Adult	0,7
Person 3:	

- Retiree or child	0,6
- Tender-year child	0,5
Person 4 – N:	
- Adult	0,6
- Retiree or child, or tender-year child	0,5

Table 11 How to determine “Adult”, “Retiree”, “Child” or “Tender-Year Child”

	8.1.1.1 Age
Adult	18 – 60
Retiree	≥ 60
Child	13 – 18
Tender-year child	≤ 13

Household credit history

Credit history is an important factor determining the ability of a household to pay back mortgage loans. In most of the Eastern European countries, including Russia, credit bureaus have not been established yet. One of the possible ways of evaluating the borrower’s responsibility under his obligations is the analysis of the borrower’s history of compulsory housing payments (Pastuhova, 2003).

We define the household having a good credit history if the household has no arrears in housing and utility payments in the previous year.

[WHAT WAS DONE FOR HUNGARY?]

Assessment of the housing value

Numerous works, dedicated to estimate the housing value on the basis of hedonistic regression model (Malpezzi, 2002), give the ground to build up the model for estimation of a housing value in Moscow and Budapest

Russia

Since our main dataset lacks housing value we should input this variable using available information, received from Moscow statistic committee and Moscow guild of realtors.

Budapest

A hedonic price model was constructed using survey data based on the respondent evaluation of his/her flat. The predicted values were used in the analyses.

Evaluation of household savings

Moscow

One more deficiency of the official statistics is the absence of information on the size of household savings, which is very important for evaluation of affordability of housing and mortgages for various household groups.

It was decided to evaluate the size of household savings by using expert opinions. To distribute total volume of savings among households it was assumed that savings of households were pro rata their aggregate adjusted incomes.

Budapest

A function was constructed to allocate the total savings (reported in the statistics of the Hungarian National Bank). The function used variables like household income, durable consumption goods, the value of the housing unit, etc.

[I DO NOT THINK YOU NEED TO INCLUDE THE MATERIAL BELOW. WE DO NOT ACTUALLY USE THIS IN THE ANALYSIS.]

Housing ownership

Moscow

In many cases, households don't go through with their intention to sell their apartment and use the money for purchasing a new one. The reason for this is that the household doesn't have the ownership rights to the apartment. In this study, we assume that household has ownership rights to the apartment in two cases:

1. if the housing is owned by the household (i.e. privatised);
2. if the housing is owned by the state or municipality. In this case household members have the right to privatise the housing in which they reside⁹. It has to be noted that the right to privatise their housing arises only once, but based on the available data this factor cannot be taken into account.

Budapest

CSO survey information was used.

Household structure / intention to move.

It is rather difficult to evaluate the household's desire to sell their apartment using statistical methods. As a rule, such evaluations are based on sociological surveys.

Approximate evaluation can be based on the analysis of the demographic structure of the household. Thus, households with complex demographic structure (e.g. families consisting of three generations) are more motivated to purchase additional housing than to expand their present apartment. In other words, such households may consider the possibility of selling their apartment in order to get the money for purchasing new housing.

⁹ See Law of the Russian Federation #1541-1 "On Privatization of Housing Stock of the Russian Federation", of July 4, 1991, with changes and additions of November 26, 2002.

We treat the household as a complex if:

- 3 generation living together or
- 2 generation living together: spouses in the age under 70 living together with their children or parents (under 70). Or
- Spouses living together with their children, older than 18.

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