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Potential effects of mortgage and subsidy programs on housing affordability: the cases of Budapest and Moscow

January 2004

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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 80s) 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 90s 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 90s 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 behavior 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 subsikdies are not a solution,

partly because the budgetary costs are unaffordable, and partly because without mean testing it will have a regressive income effect.

As part of the transition, the legal framework had been put more or less into place by the middle of the 90s, and new institutions had been established. However, housing finance had started very slowly, and until the end of the 90s virtually nothing had happened. (In Russia, the financial crisis of 1998 caused a halt in the incipient process.) What are the reasons for this?

The problem of transitional countries lies in the separation of the housing sector from the economy. The countries in transition could not use the potential economic advantages of the housing sector. The housing sector might contribute to the macroeconomic recovery, but at the same time, without macroeconomic stability, no efficient housing system could be built.

New legal foundations and new housing finance institutions cannot be built up in an environment where the housing equities are insecure, in a situation where legal and enforcement procedures do not function, and the process of economic deterioration or uncertainty is not localized. A strategy for building up a new, market-based housing finance system should include the financial management issue of the stock as well. In housing finance, the financial agent has a long-term commitment on both the demand and supply side, which depends very much on the long-term stability of the economy, along with its steady, uninterrupted development. Thus the reform in housing finance should parallel other reforms in the economy, and real changes can only be expected with stabilization.

Housing finance -- that is, the financial issues of the housing sector -- relates both to the stock of housing and to incremental investment (both in new construction and in transactions). A housing policy, which segregates the new housing construction from operation and maintenance, is very ineffective as it lacks the basic understanding of the real estate economy. The importance of this statement is underscored by the fact that in most transitional countries the sector is in "deficit". The operation of the sector is not, and could not be, financed by the household sector; and state subsidy contributions are not enough for the "reproduction" of the stock. Households do not pay their bills for housing services; and the state subsidies are decreasing as well, which leads to a steady deterioration process.

The institutional and management structure of the housing stock has an important effect on the speed of transition. Service providers in the housing sector remained mostly within the public sector, although different outsourcing methods have been introduced. The restructuring of the old-fashioned maintenance companies in urban areas is an important task of the housing sector reform.

To understand housing finance issues in the region, it is very important to see the potential range of the mortgage sector on housing affordability. The Institute of Urban Economics, Metropolitan Research Institute and the Urban Institute on the basis of their earlier cooperation proposed to study the effects of different mortgage products on the housing and credit demands and on affordability. The proposal was approved and supported by USAID.

The results of the comparative research have three parts: 1. Results related to Moscow; 2. Results relevant for Hungary; and 3. a comparative analysis of Budapest and Moscow.

This paper reports the third part of the results, the comparative analysis of the effects of mortgage characteristics and subsidy programs on housing affordability. The first section of the paper overviews the literature on affordability issues and summarizes the problems of the "cash based housing finance" system. The second part gives a background to understanding housing markets in Budapest and Moscow. The third part covers the analysis of the mortgage and affordability model in three steps: (1) the potential loan capacity, (2) affordability based on target prices, and (3) the effect of the subsidy program on affordability and equity. The fourth part draws some policy conclusions.

Housing affordability

1.1 Definition and measurements of housing affordability

Housing affordability[1] can be defined as the ability of a household to pay the costs of housing, without imposing constraints on living costs. This definition has three critical factors:

1. What is the level of housing, that is adequate for a given household? We have to define the adequate housing consumption (housing standards).

2. What is the minimum income for a given household to live (living standards)?

3. What is the "price" of housing to provide a sustainable operation (cost standards)?

There are two approaches to the affordability issue. *One* is related to paying for existing housing, where we suppose that the level of housing consumption is adequate; the *second* is related to the access to housing in a situation when the household's present housing condition is not adequate.

1.2 Affordability I: Housing cost to income ratio

The typical (and simple) approach to housing affordability is to define a threshold percentage of the household income that is the maximum a household "should" dedicate to housing costs. Housing is unaffordable if a household spends more than that percentage of its income. The rationale behind this approach is that affordable housing is an important factor in the well being of individuals and families. High housing costs relative to income are often associated with severe financial difficulty, especially among low income households, and can leave such households with insufficient income to meet other basic needs such as food, clothing, transport, medical care and education.

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

This indicator compares current housing expenditures with households' income. It can be measured for both renters and owner-occupiers. In countries with a large private rental sector the rent to income indicator is used, in countries with a low private rental sector the housing costs include user charges. The key question is how the expenditures are defined. There have been two main approaches to measuring housing affordability: (1) a proportional measure, wherein affordable housing costs are set as a fixed proportion of income and (2) a residual measure, wherein affordable housing costs are set as a fixed amount that does not vary with income level. The proportional measures are more generally used because of their simplicity.

The New Zealand Social Reports, for example, use the ratio of a household spending more than 30 per cent of its income on housing as a key indicator. There, 24 percent were in this group in 2001. In the lowest fifth of the household income distribution, 42 % spent more than 30 per cent of their income on housing.

The Australian National Housing Strategy (NHS) defined housing affordability as "an income to meet other basic needs such as food, clothing, transport, medical care and education" (NHS, 1991). Households paying more than 25 to 30 percent of their incomes in rent or mortgage payments were considered to be experiencing affordability problems. The NHS defined households in the lowest 40 percent of the income range who pay more than 25 percent of income in housing costs as being in 'housing stress'. This benchmark — and the more conservative benchmark of 30 percent — has subsequently been widely used as an overall measure of housing related hardship in Australia (AIHW 1997).

In the USA, the National Low-Income Housing Coalition (October 2000) ranks states in terms of the hourly wage needed in a 40 hour week to be able to afford a 2 bedroom apartment at fair market rent, where affordability is defined by HUD in terms of paying no more than 30 percent of household income on housing costs.

1.3   Affordability II: purchasing capacity of the households

The TTPP project focuses on affordability related to the access to housing and examines the relationship between affordability and mortgage products. Purchase affordability (accessibility) of housing is determined by factors including the price of housing, the financial resources of prospective purchasers, conditions pertaining to the granting of mortgages (e.g. the housing interest rate and the amount borrowed) and the relationship between these factors. Housing affordability indexes differ in how they measure the relationship of these factors.

1.3.1 House price income ratio

There are several ways to measure home purchase affordability, each with its advantages and disadvantages. The simplest measure compares a specific income level, usually median income to a specific house price, usually the median sales price. The advantage of comparing only two data points is that the data is more likely to be available and the concept is straightforward. The disadvantage is that the comparison hides the complexity of the housing market and may not reveal the true picture.

> In the UN Human Settlements Program (Habitat) the housing price to income ratio is defined as the ratio of the median free-market price of a dwelling unit and the median annual household income.[2] This indicator is a key measure of housing affordability, providing information on the overall performance of housing markets and important insights into several housing market dysfunctions, indicative of a variety of policy failures.

1.3.2 Housing affordability index (HAI)

There are other affordability indicators, which compare the household income to the house prices. One solution used in several countries (for example, in Australia by the Housing Industry Association and Commonwealth Bank, or by The National Association of Realtors in USA) is the housing affordability index (HAI). This index, comparing a representative income to a representative house price, calculates affordability based on mortgage qualification rules. Two versions are possible. (1) Affordability is measured by the relationship between the income needed to afford a representative house and a representative income. The higher the percentage is, the greater the housing affordability is. (2) The second approach compares the house price that a target income can afford with a target house price. The greater the percentage is, the more affordable the market is.

Australian Housing Affordability is measured by the ratio of average household disposable income to the ("qualifying") income required to meet payments on a typical dwelling (expressed as an index). In calculating qualifying income a deposit of 20 percent with repayments equivalent to 30 percent of income is assumed using a conventional 25-year loan. Income measures are based on national account estimates of household disposable income. An increase in the index represents an improvement in affordability, and a decline in the index a decrease in affordability. A value less than 100 indicates that a household with an average annual income would have less than the income required to service an average mortgage. The median dwelling price has been obtained from a census of dwellings financed by Commonwealth Bank loan approvals. An estimate of the median price of established dwellings of first homebuyers is used in the Affordability Index. The HAI was 170 in 2001 (September) and decreased to 137 by 2002 (September).[3]

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2 This indicator is one of ten "key" housing indicators approved by the Commission on Human Settlements (Resolution 14/13),

3 Source: Commonwealth Bank Housing Report September QTR 2002

The National Association of Realtors (NAR) measures the ability of the median income family (or first time homebuyer) to qualify for a mortgage on the median priced home (or a starter home). It measures whether or not a typical family could qualify for a mortgage loan on a typical home. A typical home is defined as the national median-priced, existing single-family home as calculated by NAR. The typical family is defined as one earning the median family income as reported by the U.S. Bureau of the Census. The prevailing mortgage interest rate is the effective rate on loans closed on existing homes from the Federal Housing Finance Board and HSH Associates, Butler, N.J. These components are used to determine if the median income family can qualify for a mortgage on a typical home. To interpret the indices, a value of 100 means that a family with the median income has exactly enough income to qualify for a mortgage on a median-priced home. An index above 100 signifies that family earning the median income has more than enough income to qualify for a mortgage loan on a median-priced home, assuming a 20% down payment, with the monthly P&I payment not exceeding 25 percent of the median family monthly income. For example, a composite HAI of 120.0 means a family earning the median family income has 120 percent of the income necessary to qualify for a conventional loan covering 80 percent of a median-priced existing single-family home. An increase in the HAI, then, shows that this family is more able to afford the median priced home.

1.3.3 Housing Opportunity Index (HOI)[4]

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. In the United States, this index is calculated quarterly by the National Association of Home Builders and it compares the median income in a locality with the median home price. Housing Opportunity Index is based on the median family income, interest rates, and the price distributions of homes sold in 180 metro markets in a particular quarter of a year. The price of homes sold is collected from actual court records by First American Real Estate Solutions, a marketing company. The median family income for each market is calculated by the Department of Housing and Urban development (HUD).

An HOI of 70 percent means that families in a region earning the median household income could afford to buy 70 percent of homes sold in the region. This technique requires a distribution of all house prices and median income of the target household (e.g. first time home buyers, all households, certain occupations). NAHB purchased such a data set, which shows the prices of all homes that have changed hands in a particular market. Because the address is given, the data can also be segmented into metropolitan areas and further into central city and suburbs. In 2001 (4Q) the HOI was 64,1 for the USA, and ranged from 76,1 for Springfield, MA to 8,0 for the San Francisco Bay Area, CA. [5]

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[4] See www.nahb.org

[5] Source: National Association of Homebuilders

1.4 Problem of „cash based" housing finance

After more than 10 years of transition, in countries of the region housing finance had been very undeveloped. The housing sector practically operated without long-term credit. This is a problem, because the lack of long-term loans makes housing unaffordable for the majority of households; this in turn puts strong pressure on the government for subsidies. Moreover, most subsidies can easily create disincentives for financial institutions to offer loans and for households to take loans at market interest rates. Without long-term housing finance, residential mobility is lower than it could be, which may impede economic restructuring; and households' adjustment in their housing consumption is more rigid, leaving room for distortions (like increased preferences for cars and other durable goods whose financial constraints are less important).

There are different explanations for the low level of borrowing, factors both on the bank side and on the consumer side. (See Struyk, 2001, Dimond, 1999; Hegedüs-Várhegyi, 2000) Affordability has become the key term in housing policy in both developed and transition countries. In transition countries, the puzzle is that high P/I ratio is accompanied with low level of housing cost/income ratio, which means that most of the transactions are based on cash transfers both intergeneration (inheritance) and intrageneration (family help).

In the pre-transition housing system, the key problem was the housing shortage. The housing of shortage led to a "dual housing system", which had two spheres: (1) state sphere and (2) private, where even the private sphere were under state control. However, the private sphere was based typically on "cash finance". It was exceptional in the region that subsidized long-term loans were available for transaction in the private sphere. After the transition the housing shortage has been replaced by the shortage of affordable housing, because the directly state controlled sphere diminished, and the private sector became dominant but without long-term finance.

Housing cost to income ration was low before the transition, typically 5-10 % of the net income, while in the developed countries it is around 25-30 % of the income. After the transition the housing cost to income ratio increased but it is far from the level of developed countries. Some observers conclude from this fact that households in the region are reluctant to pay higher share of their income to housing. Without efficient housing allowances it is very difficult to increase the housing cost to income ratio in these countries, because the higher burden on households lead to a "mass-arrears" situation, which is politically difficult to manage. The problem was that the income distribution became more unequal, and the lower income groups were not able to keep up with higher housing costs.

The fact is that households which move on the market typically pay a much higher share of their income formally or informally. Because of the lack of long-term loans, typically they have to use savings of the family to finance their homes, and this could involve a substantial informal housing cost. The other evidence that proves the "reluctance thesis" wrong is the high rent to income ratio in the private rental sector. To conclude, the lack of long-term credit explains the low level of housing cost to income ratio, and probably the so called reluctance of the households to spend on housing is an incorrect explanation of the low level of housing loans. The other fact that supports this argument is the high level of "car loans": households are willing to take loans for cars.

Housing market in Budapest and Moscow[6]

1.5 Housing stock, population

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

Housing investment has declined in transition countries during the 90s, with output typically plummeting to the 30-50 percent of the 80s level. Behind this trend, huge regional differences can be traced, for example, the housing output in Moscow has not decreased as much, and even by 2001 it had reached the level of 1985.

Table 1 Demography and construction between 1985 and 2001, Moscow

Moscow	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population (thousand inhabitants)	8 652	8 911	8 572	8 547	8 537	8 538	8 537	8 546	8 539	8 533	8 549
New construction (n of units)	52 982	38 863	40 684	44 193	44 481	43 707	44 444	49 233	52 239	57 560	62 604
New construction per thousand inhabitants	6,1	4,4	4,7	5,2	5,2	5,1	5,2	5,8	6,1	6,7	7,3

In Moscow the housing investments did not follow the business cycle and remained quite stable in the second half of the 90s, while in Hungary construction in the Budapest agglomeration slowed down. Because of the suburbanization, the settlements around the capital grew much faster. But on average the level of housing investment (measured by the number of new units per 1000 inhabitants) in Moscow is 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 responseto the changes in the subsidy system rather than to changes in the economic environment.

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[6] 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 (Hungary). The Moscow survey had a sample size of 1,380; the Budapest survey had a sample size of 2,148 as a sub-sample of the national housing survey. Housing income data for Moscow is an inputes data, for Budapest it was corrected. The house price data for Moscow were inputed based on real estate surveys, in Budapest respondents' estimates were corrected through hedonic price fuction. Savings data were in both countries imputed using macroeconomic data, and a distribution function.

Table 2 Housing construction and population in Budapest

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Housing Construction (new units per 1000 inhabitants)											
City of Budapest	2,4	1,9	1,8	1,5	1,7	1,6	1,7	1,6	1,6	1,7	2,4
Agglomeration	5,4	4,2	4,2	4,8	5,4	5,8	5,5	5,0	4,6	5,3	6,6
Budapest, total	3,0	2,4	2,3	2,2	2,6	2,6	2,6	2,4	2,3	2,7	3,5
Population (thousand inhabitants											
City of Budapest	2 018	2 016	2 009	1 996	1 930	1 907	1 886	1 861	1 839	1 812	n.a.
Agglomeration	554	558	564	571	589	599	608	618	629	641	n.a.
Budapest, total	2 572	2 574	2 572	2 567	2 519	2 506	2 494	2 480	2 467	2 452	n.a.

Housing remained much more subsidized in Moscow than in Budapest. As consequences of the almost "give away" privatization in Budapest, only 9 percent of the housing stock remained public (owned by local governments), while in Moscow 30 percent of the stock is still in public hands. This difference is much more a consequence of the design of privatization 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 showed that one of the motives for buying the unit by sitting tenants was the "fear" that rents would uncontrollably increase in the future. In Moscow, the population does not feel this uncertainty. In Budapest, the property right to "sell" the rental tenure is limited. 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 right--they can will the unit to another occupant and can privatize and sell the unit at any time. This has effects on the mortgage system as well.

Figure 1 Composition of the housing stock
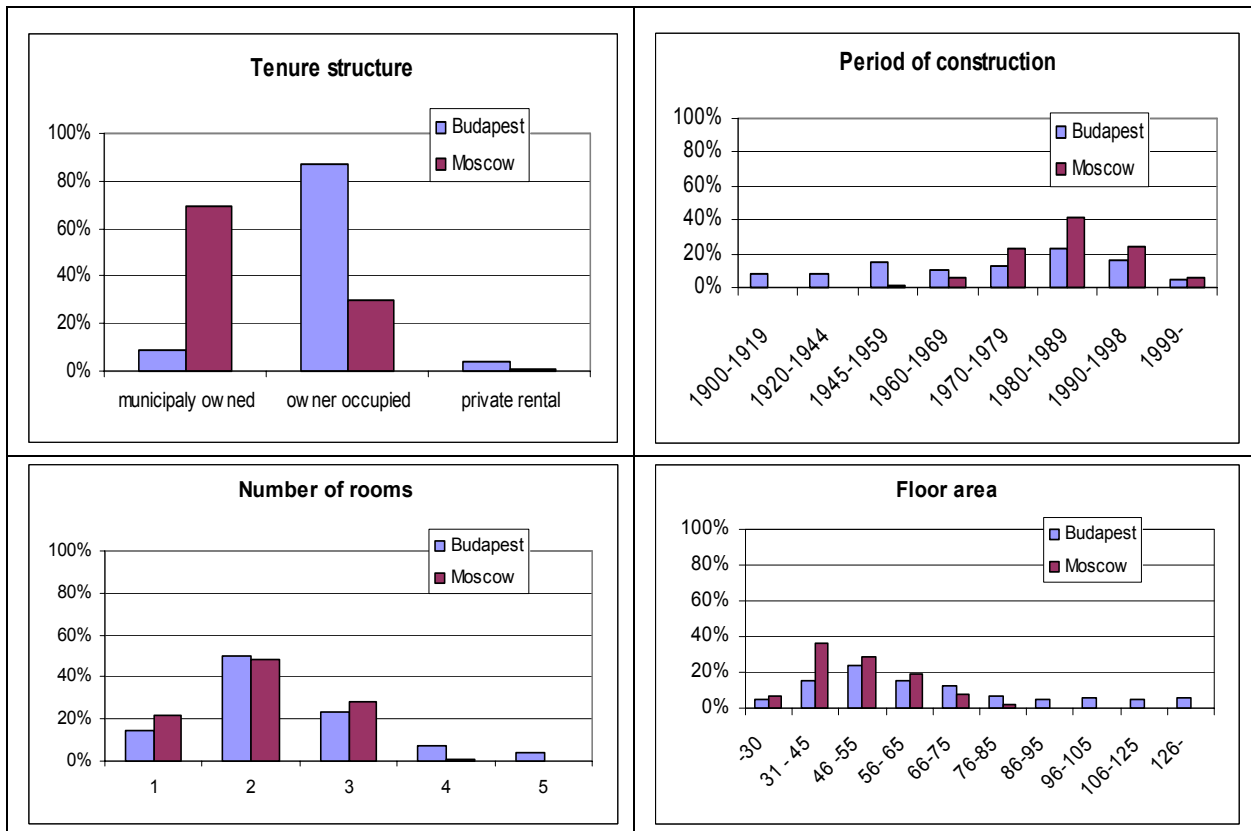
The housing stock in Budapest seems to be better in terms of size. Both the number of rooms and the floor space of the apartments are higher in Budapest than in Moscow. This is partly the consequence of the 80s when Hungary moved toward private, individual housing construction, while in Moscow, even in the 90s, the average size of the new units, was between 62-70 sq m (in Budapest around 100 sq m). In considering the age composition of the stock, it is important to realize that the units built at the turn of the last century are an important part of Budapest's stock. The Budapest housing stock is older than Moscow's, where 87 percent of the stock was built between 1960 and 1990.

The average household size is larger in Moscow and the families represent a younger structure.

Figure 2 Household size and age of the head of the household in Budapest and Moscow
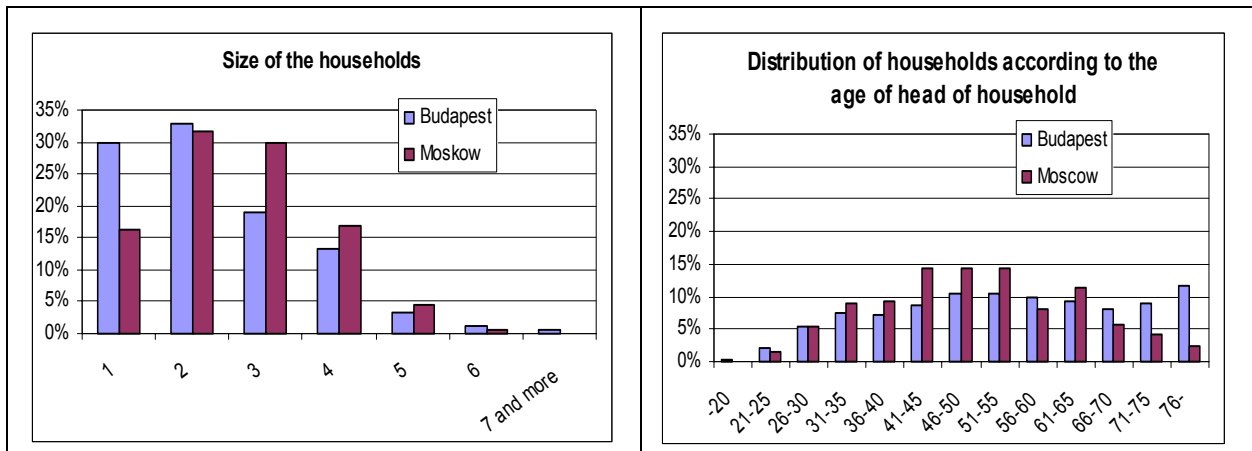
1.6 *House price, income and affordability indexes*

Affordability depends on the housing price, household income, and the terms and availability of mortgage finance. In Moscow the average household income is 30 percent higher than in Budapest. However, in the first three income-quintiles the average household income is 30 percent higher in Budapest than for the same group in Moscow. But in the fourth income-quintile the income in Moscow is 33 percent higher, and in the fifth income quintile it is higher by 133 percent. (See Figure 3.)

Figure 3 Income distribution
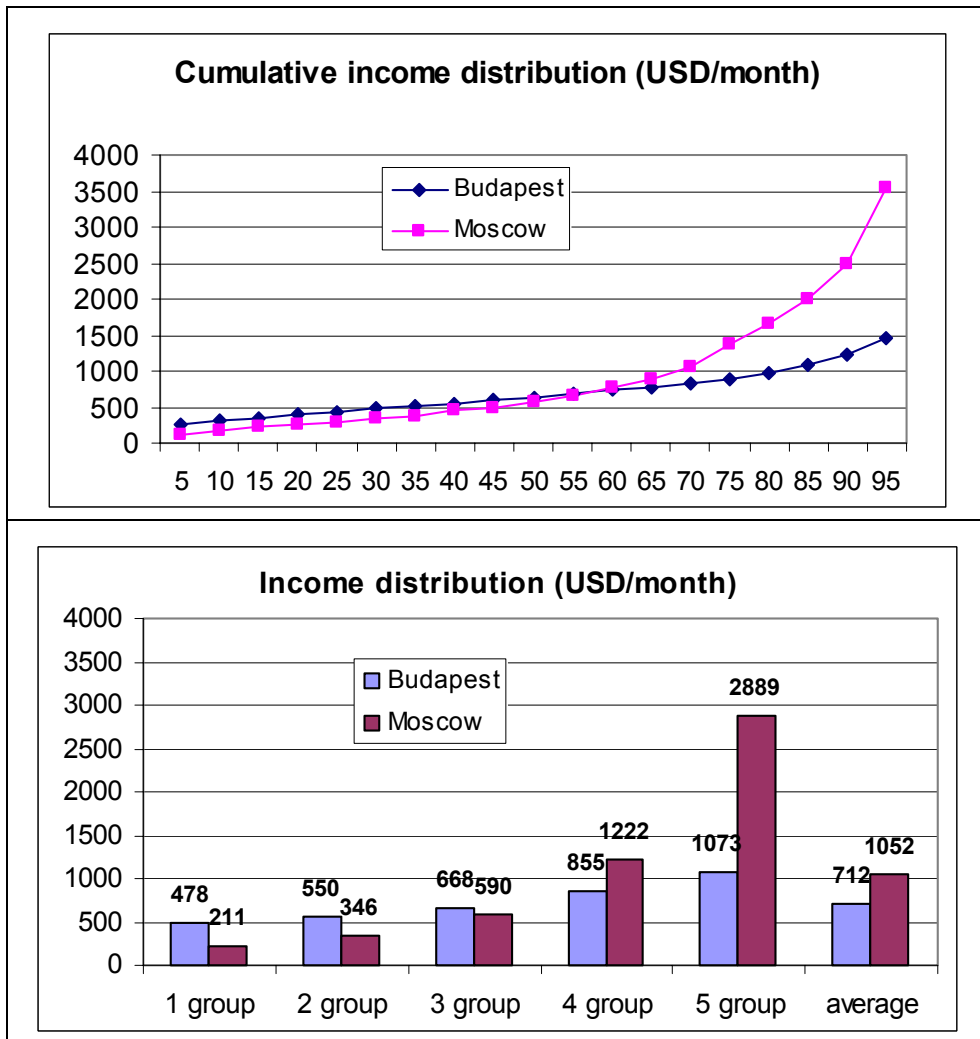
Not only the income level, but also the income distribution has an effect on housing affordability. Regarding house prices we found that they are higher in Budapest than in Moscow, as shown in Figure 4.

Figure 4 House prices in Budapest and Moscow
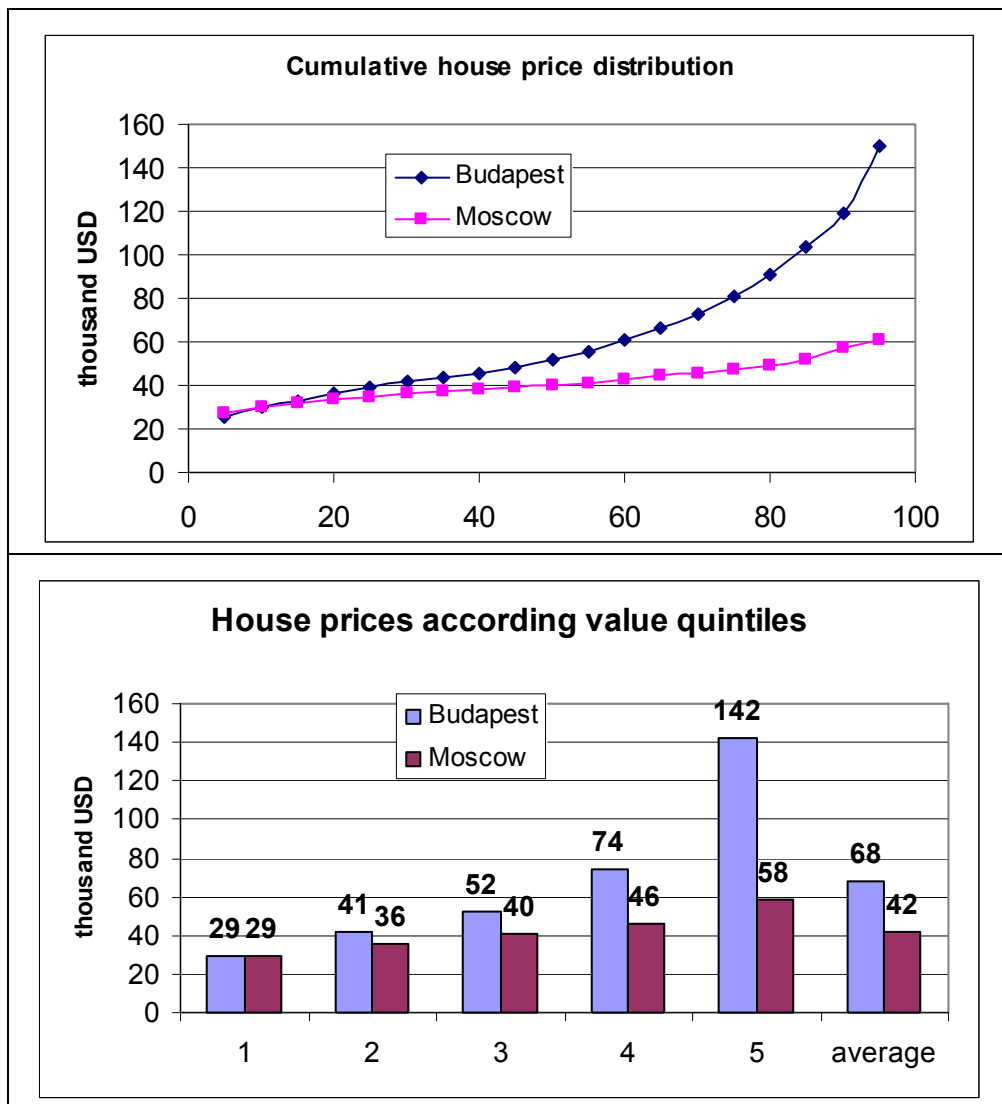
The affordability indexes show that in both cities housing affordability is a serious problem. However, it is interesting to note that this result depends very much on which data used, i.e., median values or averages. This is particularly important if the distribution of income and housing prices are asymmetric.

Thus, if we use mean values, Moscow is much better off because of its higher incomes and lower house prices. (See Table 3.) The lower interest rate in Budapest does not compensate for these factors. However, if we use median values, households in Budapest have a better affordability situation, because income is less unequal than in Moscow, therefore the median is closer to the average. Also, the house price is more unequal, so the median is much lower than the average.

These results highlight the weaknesses of the traditional affordability indexes. The values depend very much on the distribution of the income and house prices. Our research tries to overcome

these difficulties and use a measure affordability, which takes into consideration the distribution pattern of the house prices and income.

Table 3 Affordability index in Budapest and Moscow, 2003 (measured with medium values and with average values)

	Indexes based on average values		Indexes based on medium 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%

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

1.7 Institutional environment

1.7.1 Institutional Background

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 system was the economic crises that both countries went through, high inflation, deficiencies in the institutional and legal systems, and the lack of effective demand on the side of households.

By the turn of the century, positive changes happened that created a much more favorable 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 behavior 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.

1.7.2   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, they were replaced by new banks, which gradually started to mortgage lending operations.

According to available data, in 2002 mortgage lending services were provided by 149 **credit organizations** (11.2 percent of the total number of registered ones). 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 lendingthat hold backexpansion of lending activity in housing finance. Credit risk is still one of the main problem 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 undertaken to sell mortgages to HMLA. The HMLA also plans to implement mortgage lending programs in cooperation with large banks.

The HMLA willwill attract funds through the emission of mortgage securities, although to date it sold only non collateralized 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.

1.7.3   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 to 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% 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 on the housing lending market has considerably grown 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.

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, owned by the Germans (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. ButFHB was themn 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 favorable with the introduction of new interest rate subsidy system. However, the contract saving banks enjoy high subsidies on the saving side.

Effects of mortgage and subsidy programs

1.8   The model

The model used to estimate the loan and housing demand capacity is based on household surveys. In the first block, using the household's characteristics (income, savings, house price, age, family size etc.) and the mortgage product characteristics, we estimate the maximum capacity for loans and for housing purchase on the two markets (Block 1 in Figure 5). We studied the effects of the mortgage product characteristic, on the potential demand for two groups of households in different housing circumstances: trade-up and "first time buyer" (fully defined below). The effective mortgage demand depends on the target prices and behavioral "rules" for the individual households (e.g. what is the price of the housing unit a given household wants to buy, and on what conditions the household will decide to move). Based on housing market information, we defined target unit prices and introduced some simple behavioral rules. For example, households will move if they can buy a unit whose value is a minimum of 25 percent higher than the value of the existing unit. Using this information we analyzed the housing affordability of the different households (Block 2).

The next question we raised was the possible effects of different subsidy programs. We examined three subsidy programs to define the effects on the total demand (effectiveness) and on the affordability of the different income groups (Block 3).

Household Core Data →(Corrections, imputations, etc.)→ **Adjusted Household Data**

Income, savings, dwelling value

Other

Block 1. The Mortgage Model
1. Interest Rate
2. Loan term
3. Loan to value ratio
4. Payment to income ratio
5. Insurance, taxes, closing costs
6. Other constraints

Maximum affordable value of housing

"Target house"
Selecting "target house" indicators on the basis of data on housing price distribution

"Target house" indicators

Block 2. Housing Affordability Analysis
Evaluation of a share of housing units that can be purchased by a specific household group.

Maximum affordable value of housing

Subsidized programs

Subsidies

Block 3. Costs-benefits Analysis of Subsidies
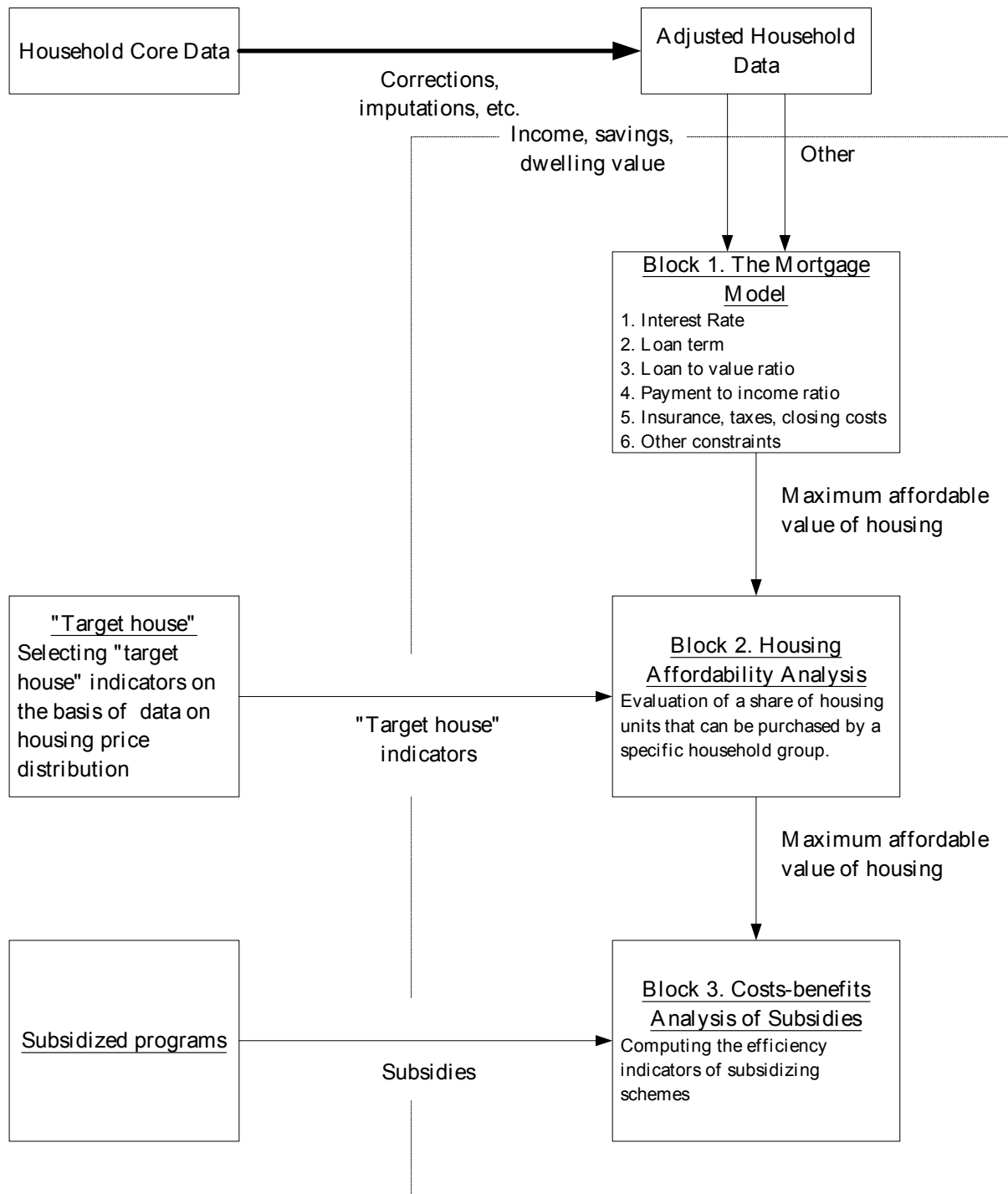Computing the efficiency indicators of subsidizing schemes

Figure 5 Structure of the model

When estimating the maximum loan and housing demand capacity, we started from a standard model and examined how the changes in loan terms affect the demand.

We focused on the comparison of the two markets and did calculations for two scenarios:

1. We assumed that every household who owns its apartment could trade up[7]. 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.

2. We assumed that where there is no possibility to sell the apartment, or no trade up, every household has to move into a new dwelling without the possibility of selling the existing housing unit. This is the „first time buyer" option.

The housing demand is a function of loan capacity (that in turn depends basically on income), savings and house price. Thus the difference between the two options is the price of the existing unit. In the first case the accumulated value of the existing unit can be used as „savings" in the „underwriting" process, thus the loan capacity should be much higher than in the first time buyer option.

Table 4 The standard loan product used in model and the actual typical loan product's parameters in Budapest and Moscow

Characteristic	Unit	Model	In Hungary	In Russia
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
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
Annal 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 agreemen	$	100	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	26	25

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[7] For households who are renting in the private market or who have "complex" or multigenerational families, the model did not allow "selling" their units. Moscow renters of municipal housing are treated as owners since they can privatize their units at any time.

In the comparative research we focused on the effects of the interest rate and the LTV ratio on the share of the households who would be eligible to take loans, along with the total absorption capacity of the household sector. The standard mortgage loan product described in Table 4 was selected. We tried to use parameters, which are close to the reality on both markets. The market interest rates are quite close, though in Hungary a "deep interest rate" subsidy buys down then effective rate to 6-7%. The selected interest rate represents a "kind of averages" to make the comparison possible. Defining the "value gap" we were looking for a value of the increment in housing value, which represent a threshold below household will not move.

1.9 Trade-up option

According to our model, the Moscow market has more loan capacity both in terms of the share of households and in terms of the total dollar amount of the loan than the Budapest market.

Table 5 The total loan capacity in Budapest and Moscow: standard loan product, trade-up option

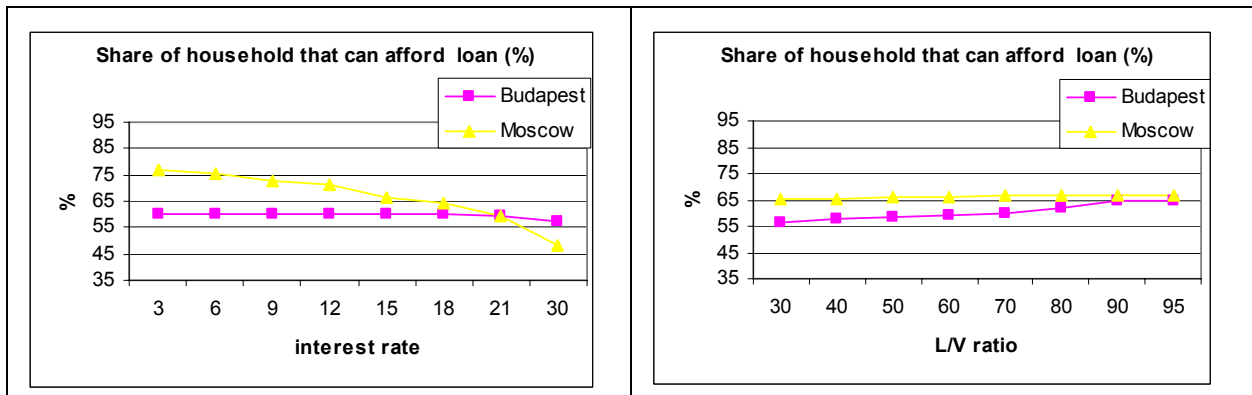|	Budapest	Moscow
Share of households that can afford a loan, %	60,2	66,5
Maximum loan capacity, mill $/1000 inhabitants	11,6	17,2
Maximum capacity of demand for housing, mill $/1000 inhabitants	88,3	69,3
Average loan size, thou. $	18,6	25,8
Average LTV ratio, %	17,4	31,2

There are several reasons for the differences:

- In Moscow the income is higher, which justifies more than a 70 percent higher loan capacity,
- In Budapest the value of the existing housing stock is much higher, which results in a higher maximum capacity of the demand for housing
- The difference in share is related also to the demographic structure.

The next question was what is the demand elasticity of the interest rate and the loan-to-value (LTV) ratio.

The two markets react to the changes of the interest rate in a very different way. In the Budapest market practically there is no change in the share of households who can enter the market if we move from the high interest rate regime towards the low interest rate regime. In the Moscow market, the chance to access loans changes from 48 to 77 percent as the interest rate falls from 30 to 3 percent. In Budapest, in contrast, there is only about a 5 percentage point change over the same range.

Figure 6 Dependence of loan affordability on the interest rate and on LTV (trade-up option)

We find a different situation studying the effect of the changes in LTV ratio on the share of households who can enter the market. Loan demand on the Moscow market is not as elastic to the LTV ratio as the Budapest market. However, the range (difference between the maximum and minimum share) is less in the case of LTV than in the case of the interest rate (Figure 6).

The reason for this is that in the case of the Budapest market 34 percent of households are not eligible because of their age and 9 percent of the households do not own their apartments, thus the share cannot increase above this limit. The other factor is the loan minimum, which can affect the share. At a given minimum LTV level, either the savings or the income will be the constraint. The model calculates the maximum possible loan for a given household based on its income and savings. If the market is not elastic with respect to the interest rate at a given LTV level, it means that the majority of the households have reached their loan maximum capacity because of the savings. At a given income level, a lower interest rate means a higher loan capacity; thus if loan demand does not increase it would mean that savings is the constraint for a majority of households. To study the effect of changes in the LTV, we can follow the same line of thought. At a given interest rate, a change in the LTV will have an effect, if savings was the constraint on loan capacity. Generally, the trade up option represents a situation in which the income is the main constraint to increased loan capacity, thus the demand will change as a function of the interest rate.

Figure 7 The effect of the interest rate on the loan characteristics (trade-up option)
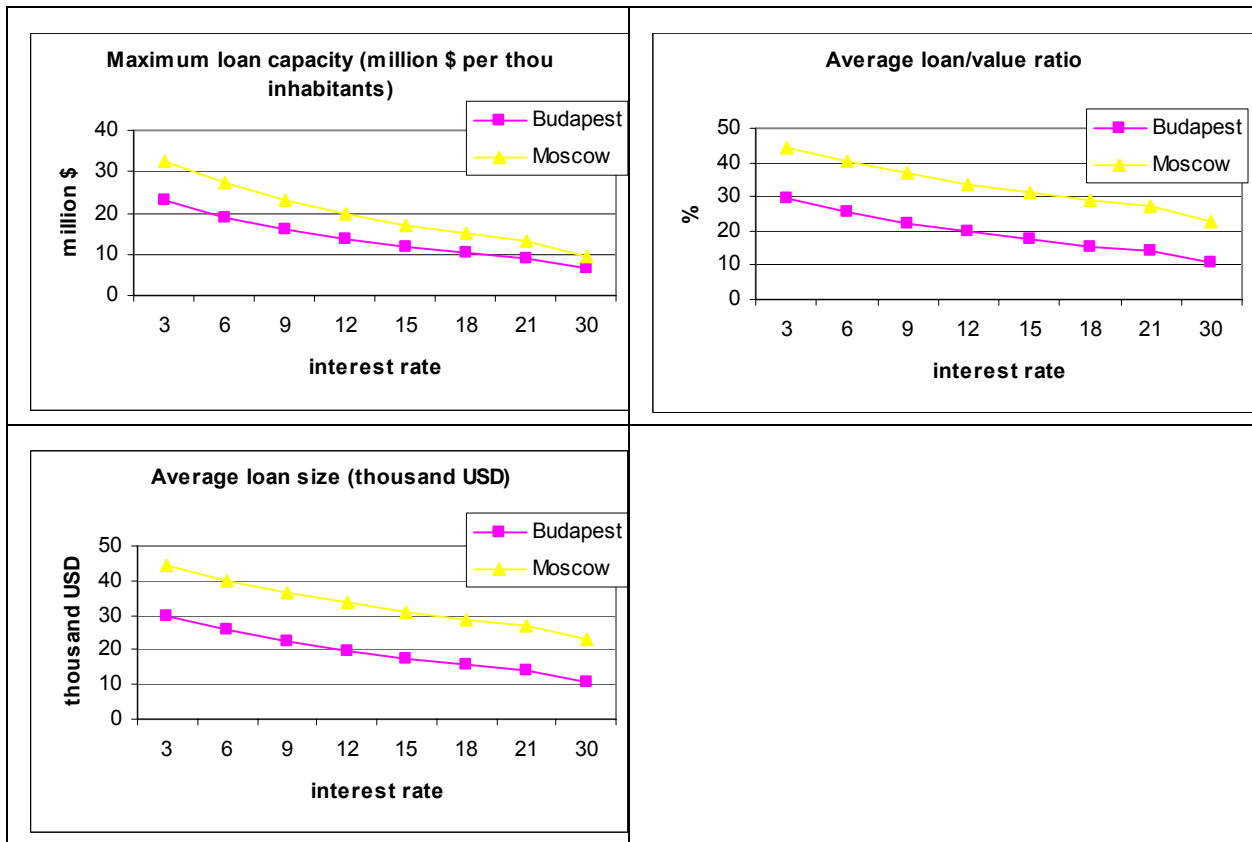
When changing the LTV, there is very „limited room" for demand change. For example, for the case of a 12 percent interest rate, savings is the „bottleneck" to increase the loan demand for only 4,8 percent of the households; thus the change in LTV practically does not have any effect. (The change of the loan term has the same effect as the interest rate.)

1.10 The first time buyer option

For the first time buyer option, in both markets around 50 percent of the households would be eligible to take standard loans. Again, the relative loan demand is higher in Moscow based on the higher level of income. The loan to value ratio is higher in Moscow because of their lower level of savings. Naturally the total demand is much lower in the first time buyer option than in the trade up option, as the value of the existing units has been taken out from the demand.

Table 6 The total loan capacity in Budapest and Moscow: standard loan product, first time buyer option

	Budapest	Moscow
Share of households that can afford a loan, %	52,2	50,1
Maximum loan capacity, mill $/1000 inhabitants	9,9	15,2
Maximum capacity of demand for housing, mill $/1000 inhabitants	22,9	27,6
Average loan size, thou. $	18,3	30,4
Average LTV ratio, %	48,0	59,6

In the case of the first time buyer option, the loan demand is not elastic with respect to the interest rate, because the savings is the main constraint on increasing household loans. At a given LTV level, very few households can borrow more if we change the interest rate, because their savings already defined the upper limit of the loan. If we go up to the maximum LTV, the elasticity of the loan demand depending on interestrate decreases. (At 70 percent LTV the elasticity is very low.)

Figure 8 Dependence of loan affordability on the interest rate and on LTV (first time buyer option)

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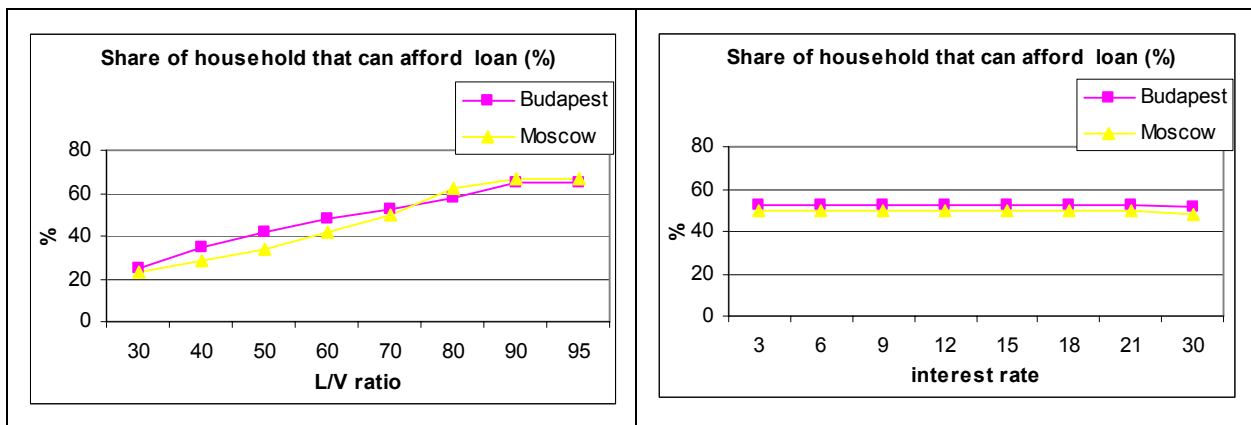
1.11 Issue of unequal access to mortgage

The access to loans depends on distribution of the income and wealth („savings") among the households.

The two markets are very different. Generally the access to a loan in the first time buyer option is more unequal, because only the income and savings play a role in the selection and the value of the existing unit is not counted. The distribution of the housing value is more equal than the income and saving distribution, which explains why the value of the gini index will decrease in the trade-up option.

The value of the gini index differs in Budapest and Moscow, because the income inequalities are much higher in Moscow than in Budapest (Table 7).

Table 7 unequal accesses to loan (standard loan product)

	Trade-up		First time buyer	
	Budapest	Moscow	Budapest	Moscow
Gini index (number)	0,09	0,1	0,14	0,36
Gini index (volume)	0,21	0,5	0,26	0,63

Next question: how it would change with the changes of characteristics of the loan product:

Figure 9 Gini index of the access to loans in trade-up and first time buyer option

Affordability analysis

The affordability analysis is based on the demand 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 house" 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 used 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[8]. 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 % point of the housing price distribution)
- Modestly priced house (25 % point of the housing price distribution)
- Low price house (10 % point of the distribution).

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[8] 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 chapter we used this data as well.

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

Table 8 Target prices based on the stock and on the transactions

	Moscow		Budapest	
	stock	market	stock	market
Median priced	$39710	$55000	$50825	$50000
Modestly priced	$33924	$42 000	$39005	$36364
Low priced	$28617	$36 000	$29985	$29540

Actual demand depends very much on the desire or intention to move. We supposed that a household "will move" if the house it can buy is "better" than the existing housing unit. In the model, the condition that a household will move depends on whether the housing unit they can buy has a value at least 25 percent higher than the existing one. Twenty-five percent seems to be a minimum, and probably the actual market "leap" is bigger than that because of the high transaction cost.[9] 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.

The other behavioral question was the issue of household formation. In the market for existing units, a substantial share of transactions is connected to new households that are created when a part of the family will remain in the existing house and a new household will be created (splitters)[10]. 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

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[9] 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 that 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 %. (See the details in the Hungarian study.)

[10] In the case of splitters, the existing homes cannot be sold, which of course will reduce the demand capacity. Demand capacity is the sum of the maximum loan, the savings, and the price of the existing units).

market with high mobility (65-75 percent). In the comparative analysis, we will study the loan products and subsidies separately for trade-ups and splitters.

1.12 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. It is interesting to note, that while loan affordability was more favorable to the households in Moscow, house-buying affordability is more favorable to the 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 can buy the median priced units. (The difference is less than 5 percent.) 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 9 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. It is important to note that in the analyses of the potential loan capacity we concluded that in the trade-up option demand is more sensitive to the interest rate changes than to LTV changes. The reason for this was that for the majority of households the constraint on increasing the demand was their ability to pay the debt service that is influenced by the interest rate.

On the basis of the next figure, which focuses on the median price dwelling, we have very similar conclusions. Changing the LTV can influence the affordability of the trade-up option much less than changing the interest rate.

With respect to the equity issue, there is substantial difference between the Budapest and Moscow housing market, which reflects the income inequality.

Figure 10 Effects of interest rate and LTV on affordability I. (trade-up option)

Share of hh that can buy median priced dwelling
(interest rate)

Share of hh that can buy median priced dwelling
(LTV)

Average loan size (median priced units)
(interest rate)

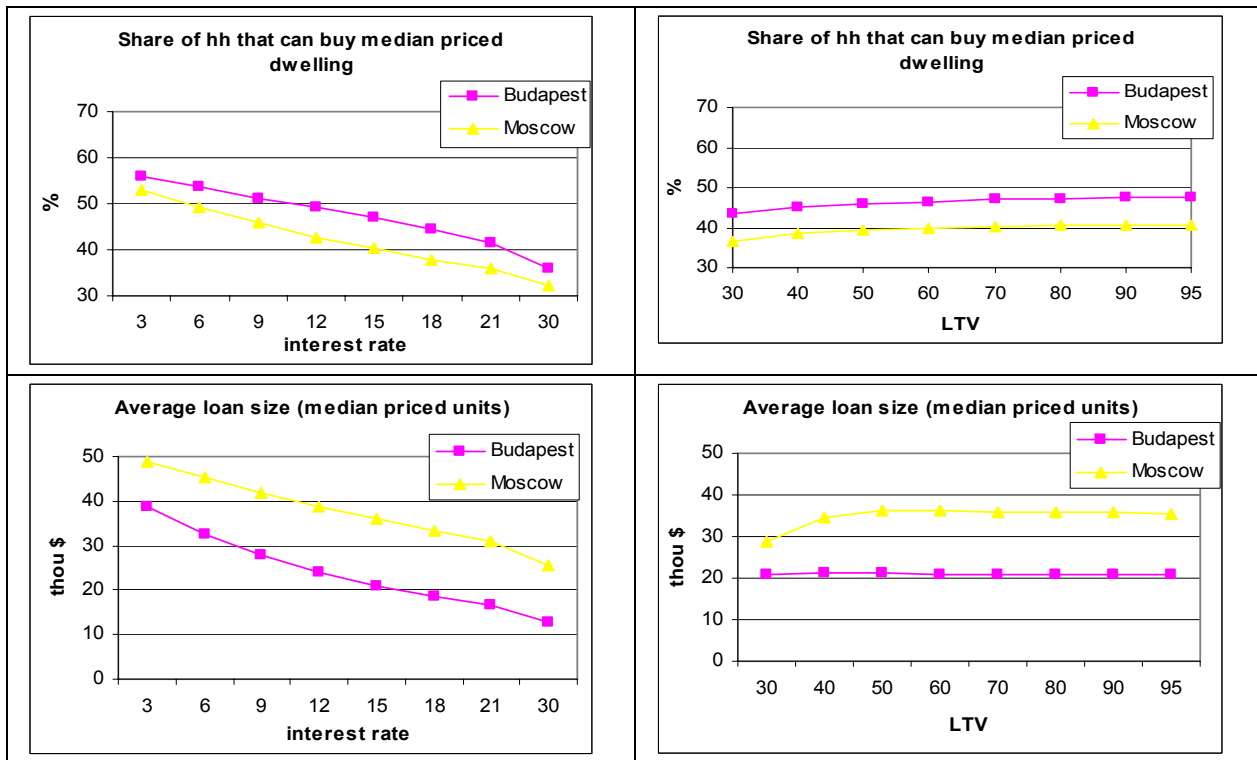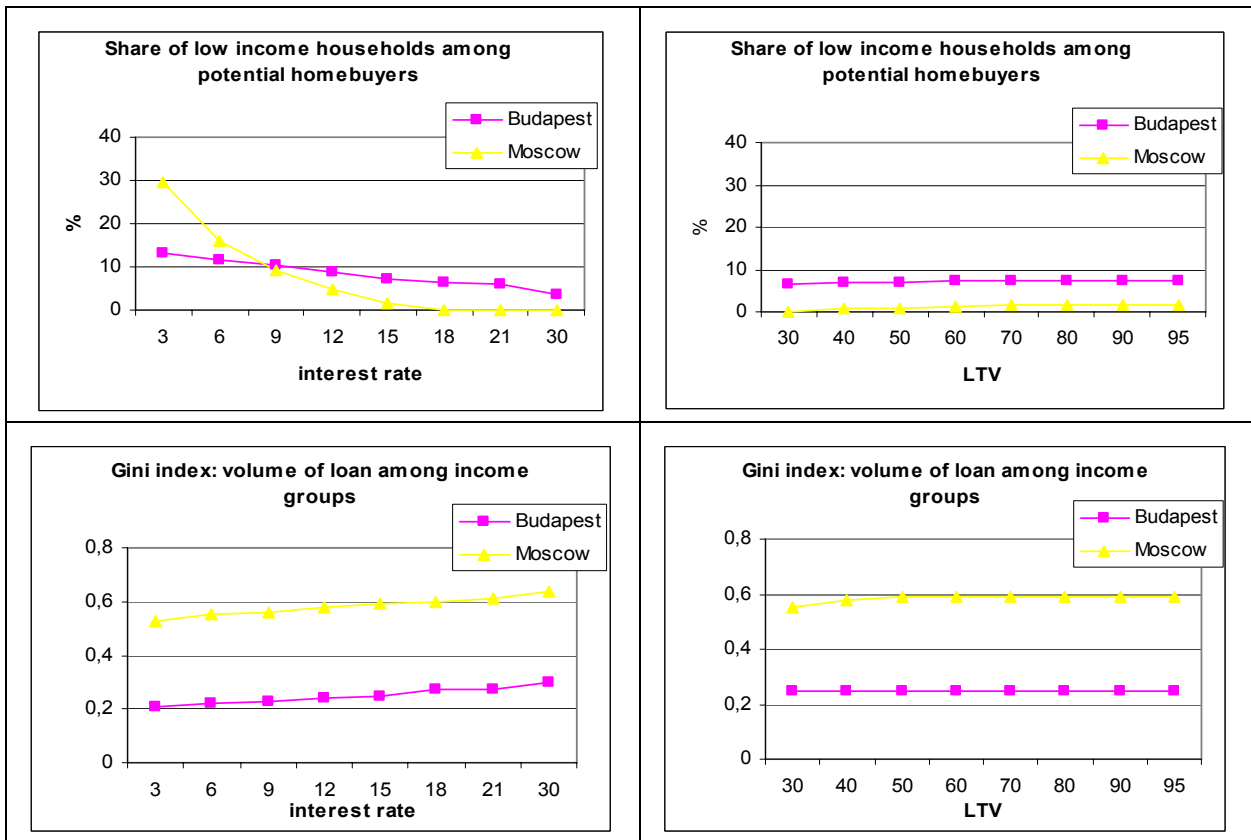Average loan size (median priced units)
(LTV)

Figure 11 Effects of interest rate and LTV on affordability II. (trade-up option)

The relative size of the potential demand for mortgages is higher in Moscow, which can be explained by income differences. At low interest rates, the loan capacity is almost fully used. As the interest rate increases, the potential demand for mortgages decreases, not just in absolute terms, but relative to the loan capacity as well. This tendency is more present in the case of Budapest.

Figure 12 Effects of interest rate on the potential demand for mortgages
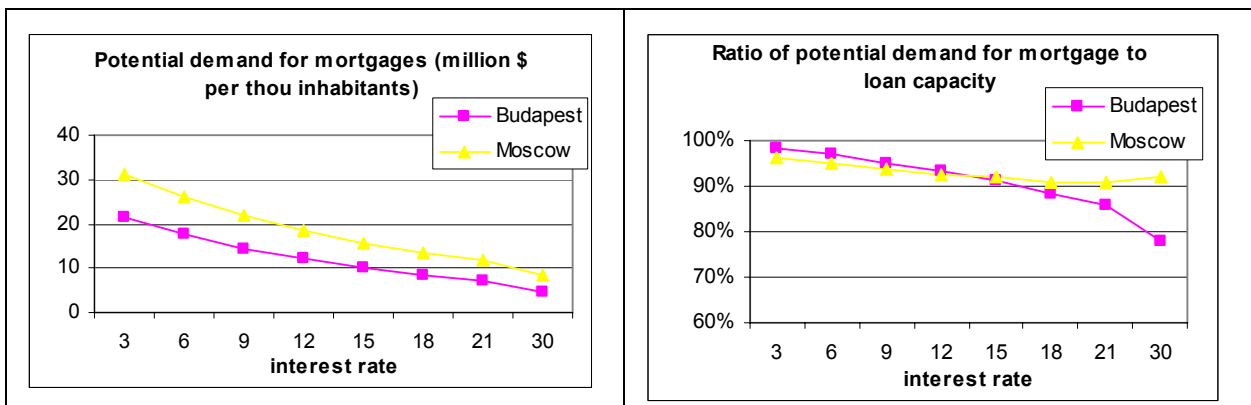
The affordability analyses are very sensitive to the target prices and to the „behavioral rules". We supposed that households move if they can afford a new unit more valuable than the existing one. However, we set the rule that the new unit should have a higher value by 25 percent, that is, if the "value gap" is equal to 25 percent. If we increase the value gap to 50 or 75 percent, the potential demand will decrease substantially.

Table 10 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

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.

1.13 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 ratio of households who can buy median priced dwellings is very close to the affordability indexes used in the international experiences. We examined what share of the households 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.[11]

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

Table 11 Affordability first time buyer option, standard loan product (%)

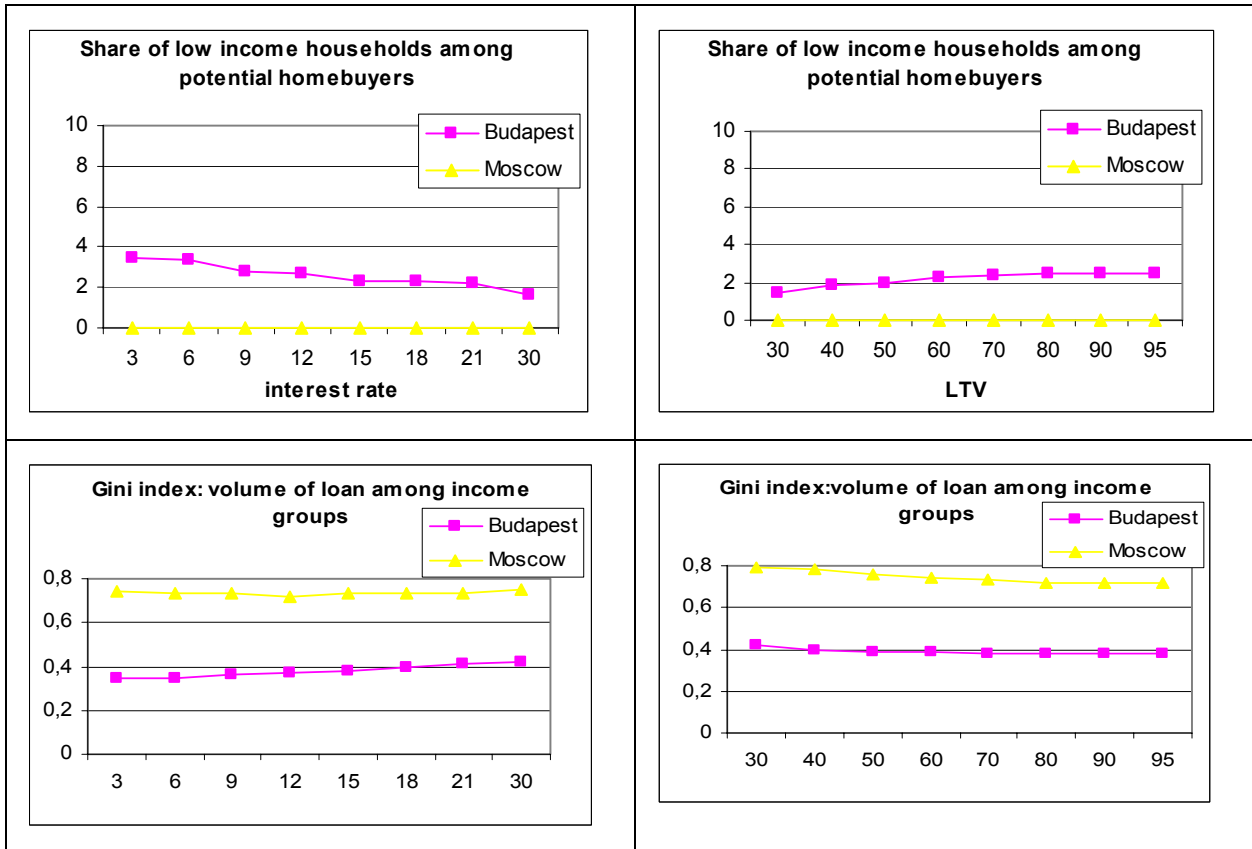|	Budapest	Moscow
Loan capacity (share of hh)	52,2	50,1
Share of household that can buy		
Median-priced dwelling	11,7	15,1
Modestly-priced dwelling	20,4	19,0
Low-priced dwelling	26,2	22,9

In Budapest 26,2 percent of the households can buy low-priced units, in Moscow 22,9 percent. The affordability here is very sensitive to the target price. 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 11,7 percent of the households can buy median priced units in Budapest, and 15,1 percent in Moscow.

The first time affordability is more sensitive to the change in LTV than to the interest rate. This is shown in the figure 13-14.

Figure 13 Effects of interest rate and LTV on affordability I. (first time buyer option)

Figure 14 Effects of interest rate and LTV on affordability II. (first time buyer option)

Share of low income households among potential homebuyers (interest rate) — Budapest, Moscow

Share of low income households among potential homebuyers (LTV) — Budapest, Moscow

Gini index: volume of loan among income groups (interest rate) — Budapest, Moscow

Gini index: volume of loan among income groups (LTV) — Budapest, Moscow

Effects of the subsidy programs

In the last phase of the research we examined the possible effect of the three subsidy schemes shown in Table 12 on housing affordability. The first one is an interest rate subsidy (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 % in Hungary). [12]

Table 12 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[13]	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 affordability and housing demand are not sensitive to the changes in interest rates in the case of first time buyers.

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 % to 6 %. 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). This increases housing demand by 10,5 bln USD in Budapest and 40,2 bln USD in Moscow.

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

[13] 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.

Table 13 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
Demand analyze				
Potential demand 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 the Subsidy B program 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 (in Budapest), and 53,5 percent (in Moscow) are eligible for the subsidy.   The Subsidy B program is more efficient because it increases affordability relative to the present value of the subsidy. With a subsidy of only 13-15 % of that of the Subsidy Program A, the increase in affordability (to compare to the baseline version) is more than half of the Subsidy A's effect. The Subsidy Program C seems to be even more efficient.

Table 14 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
Demand analyse				
Potential demand 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

We can measure the relative efficiency through an indicator, which compares the result of the subsidy program to the present value of the costs. Both in Budapest and in Moscow, the subsidy Program C is the most efficient, the next one is the Subsidy Program B and the last one is the Subsidy Program A.

The simple reason why the Subsidy 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 subsidy to the households who have already reached their loan capacity. The issue here is what are the constraints to increased affordability. Program A and Program B can not help the households who are facing "downpayment-constraints". Here Program C becomes more efficient, because it will give cash subsidy to the households with low savings.

Program A increased the affordability by 7 percentage points for the share of households who can afford median priced units increased--from 47 % to 54 % in Budapest. In Moscow, the effect of Program A is more significant as it increased the share of the households who can afford the median priced unit from 40 % to 49 %. In Budapest, Program B, however, is more efficient: the share of households who can afford median-priced houses would increase more than twice than in Program A. In Program C the difference is four times. In Moscow, the efficiency gap is bigger among the programs, because Program A is very inefficient. The reason for this is the huge income inequalities in Moscow. (See Figure 5.)

If we measure the effects of the programs on the demand for housing and for loans, we have basically the same conclusion. However, there is an important difference: Program C increases housing demand more than Program A or Program B, but less the demand for loans. This is because the subsidy is an upfront subsidy. In the Hungarian political discussion, the bank lobby was much more interested in the interest rate subsidy than in moving towards a cash-based subsidy. Their argument was that housing demand would change as interest rates go down, but they did not take into consideration the lack of savings as the main constraint on increasing loans.

Figure 15 The effects of the subsidy programs on the demand for housing and loans (as relative to 100 USD subsidy)
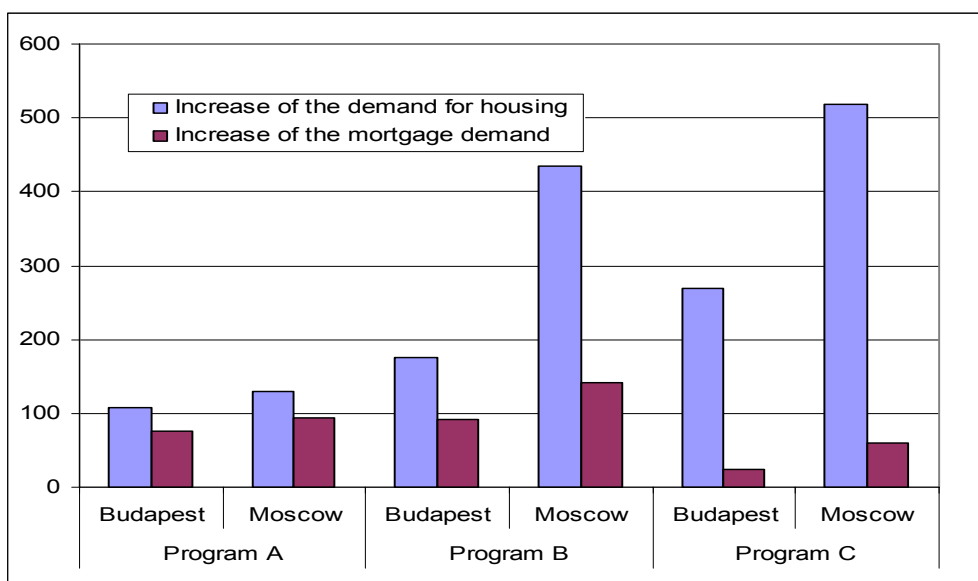
The equity issue is very important as well. Programs B and C have the same effect, because they are means-tested schemes. The difference is huge between their effects and those of Program A, but even Program C will not result in a progressive distribution of the subsidy. In the case of Budapest, as a consequence of means testing the subsidy, the first three income quintiles have the same chance to get the subsidy; and there is no difference between them. We could expect that lower income groups will have more subsidies according to the program rules. But this is not the case because among the low-income groups the share of households who cannot afford the median priced house – even with the subsidy – is higher than among the higher income groups. The 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).

Figure 16 Allocation of the subsidies among the income quintiles
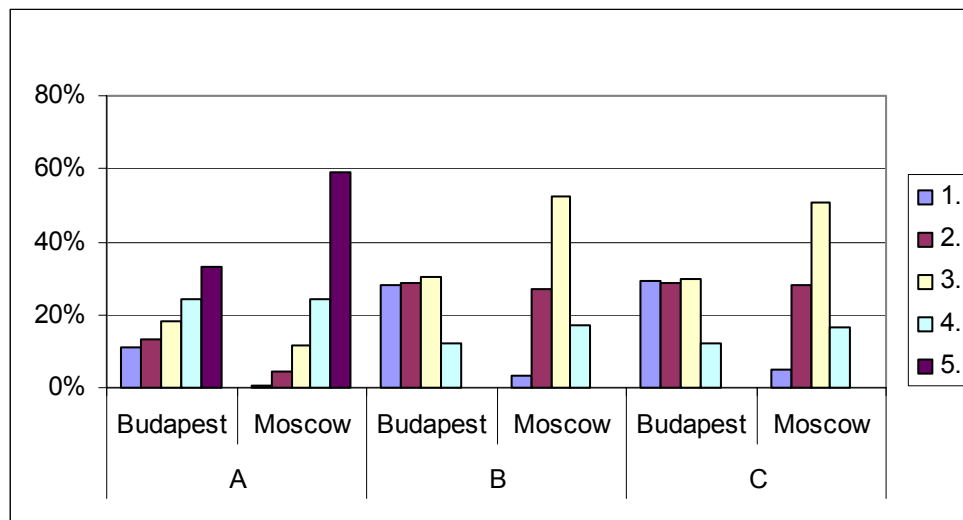
Conclusion: housing policy recommendation

This analysis explores the potential effects of mortgage characteristics on potential housing and loan demand. The research has produced insights into the problems housing policy makers face when they want to increase the role of the mortgage system. 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. Consequently, for example, we will not know the supply side effect of the housing units "sold" on the market as a result of the new mortgage products. It is clear that the increased demand for housing will result in an increase in the volume of trade-ups involving existing units. The question is what will be the price effect of this demand. It depends on several factors we could not and did not want to include in the model.

The policy advice based on our research on the superior way to support long-term borrowing is to select Program C. The Hungarian subsidy program (Program A) gave a 9 % (flat) interest rate subsidy, which helped the trade-ups and first time buyers (with high family savings). Moreover, it gave incentives for household 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. Program B would have had better results in terms of the equity issue, but from an efficiency perspective, Program C is better in these two diverse housing markets.

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