

Mortgage Products in Moscow: The results of Analysis

Background

The main purpose of this analysis is the development of the model for assessing the availability of mortgage products for various household types. In addition, the report assesses the availability of apartments on the existing market with account for equity financing, sale of the existing unit, and a home mortgage loan.

The main results are the assessment of the maximum mortgage market capacity and the potential demand for mortgages and the potential demand for housing. The maximum market capacity for mortgages is described as the volume of loans which may be extended to private individuals for the purchase of housing. This indicator reflects only the households' ability to obtain a mortgage loan, failing to capture their capacity to improve their living conditions. For example, many households have incomes sufficient for obtaining a mortgage loan (i.e. meet the paying capacity requirement) but their funds are not enough for improving their living conditions, i.e. for purchasing housing at market prices. The potential demand for housing and the potential demand for home mortgages take into account the households' actual ability to improve their living conditions. Here and later the households' real ability to improve their living conditions is understood as the ability to purchase a unit of the desired parameters (the so-called "target housing"). In the event a household intends to finance a portion of the cost of the new unit by selling the existing unit, it is assumed that the household will move into a new unit only if the move will result in an improvement (i.e. the cost of the new unit is at least 25 percent higher than the cost of the housing being sold).

Moscow housing market could be divided into 4 main categories of "target housing":

1. "expensive (elite) housing (50 percent of the offers). These units are priced at \$55 thousand or higher;
2. "inexpensive housing" priced at \$ 42 to \$ 55 thousand (15 percent of all units offered);
3. "cheap housing" at \$35 to \$ 42 thousand, constituting 10 percent of all units offered);
4. "low-quality housing" priced below \$35 thousand. These units, representing 10 percent of the cheapest housing, are not considered in this paper as in this case one can hardly speak about an "improvement".

Thus our model assesses the potential demand for housing and the corresponding demand for loans for three segments of the housing market.

The potential demand for housing and for home mortgages will typically exceed the current demand for housing and mortgages, because they fail to take into account the factors that affect a household's final decision to purchase a better unit, reflecting only its ability to do so.

As a practical matter, a household's inclination (or desire) to change residence or sell the existing apartment is hard to estimate. It depends on a variety of factors, such as household size, composition, personal preferences, theoretical ability to purchase a larger unit, and others.

Within the framework of our model, we classify all households into three groups:

Renters who do not own any housing and reside in leased premises (about 0.5 percent of all households in Moscow); Households-occupants of municipal units normally are eligible to privatize them. In fact, reportedly only a few households rent municipal units without privatization option, but this group of households is impossible to identify by using the

Moscow Statistics Committee database. Therefore, presumably all households occupying municipal units are treated as homeowners.

- Splitters, or complex households who will most likely want to improve their living conditions with the use of the proceeds from the sale of their existing unit or without such (i.e., to acquire a second apartment) (about 30 percent of all households). For example, a household consisting of parents with their son and his wife may want to split and acquire two apartments (one for the parents, and the other – for their son and his wife). This means that the household will look for a small apartment. Another possible behavior option for this household is to buy a larger unit partially financed by the proceeds from the sale of the existing unit.
- Movers interested in exchanging their unit for a bigger or a better quality unit with the sale of the existing unit (about 70 percent of all households).

The proposed model assumes that households will not improve their living conditions and demand new housing if the resultant improvement is insubstantial, i.e., the difference in the price of the existing and purchased units is less than 25 percent.

The maximum loan capacity and potential demand for housing and mortgages will be analyzed for two cases.

The first option (“new housing”) will estimate the potential demand of households interested in acquiring a new unit (without selling the existing one), i.e. renters and splitters. The model indicators will reveal opportunities for these households to improve their living conditions given a limited volume of savings and unavailability of equity (apartment) that can be contributed toward the price of a new unit.

The second option (“trade-up”) analyzes the opportunities of all households on the assumption that splitters will be able to finance a portion of the costs by selling the existing unit. In other words, we suppose that every household desiring to improve its living conditions which has its own housing will use the equity value of this housing to acquire a new unit.

Table 1 shows the incomes of the each of the 20%-groups of households. On the average, those households who have neither ability nor desire to sell their apartment, have lower incomes.

Table 1. Distribution of income by income groups

Group	All households		Renters and Splitters	
	Quantity of households	Income range	Quantity of households	Income range
1	20%	Up to \$123	20%	Up to \$111
2	20%	\$123 - \$195	20%	\$111 - \$152
3	20%	\$195 - \$363	20%	\$152 - \$205
4	20%	\$363 - \$876	20%	\$205 - \$415
5	20%	above \$876	20%	above \$415

The results of this research will be useful for various market players: ministry officials, mortgage legislators; banks; federal, regional and municipal mortgage agencies and housing funds; real estate brokers, builders, and other parties.

The proposed model and calculations are an important contribution to the efforts for designing residential mortgage lending systems in Russia, and home mortgage programs in selected regions and municipalities. The estimates derived from the proposed model will

enable mortgage specialists to estimate the required mortgage lending volumes for their programs, and the affordability of mortgage programs offered by these programs.

In addition, an important component of the model is its ability to compare various subsidy programs for the purchase of housing. The model compares two subsidizing approaches: down payment subsidies for a mortgage loan and interest rate subsidies to mortgage lenders. The efficiency of different subsidies may be compared. Experts designing programs of housing finance will have the data for tracking improvements in the affordability of housing and mortgage loans for various household categories, and the potential participation rates for low-income households. The calculations provided by the model will be useful for adjusting the program activities and parameters for targeting specified populations.

The model also allows for international comparisons of the mortgage programs in different countries, and for identifying development areas for residential mortgage programs.

The conclusions obtained on the basis of the proposed model will enable banks to assess the potential demand for their mortgage products and compare dissemination options for various products. The model may be also used to forecast the potential mortgage market capacity (which is important for banks designing their development strategies and areas for expanding their retail operations). In addition, estimates produced by this model will help banks to identify prospective users of their mortgage products, i.e. the type of households which may be ready to accept the terms offered by the bank's program. Banks will be able to structure their promotion campaigns accordingly, and to design advertising policies that are targeted to specified household types.

The model will also be of interest to the federal and regional mortgage agencies, and housing funds. These agencies and funds will be able to obtain data on the potential consumer demand in relation to the current prices on the housing market. An important aspect of the activities of such organizations is the ability to develop mortgage products and identify lending conditions which correspond to the effective demand. The model will help the mortgage agencies and housing funds to design effective marketing strategies for the development of residential mortgage lending.

The results of this research may be also useful for construction companies which build residential properties. The model provides estimates of effective demand for housing, including the price levels that households will find acceptable, as well as the potential demand at each segment of the housing market (low-priced, moderately-priced and expensive housing). The data may be used for designing business-plans for construction companies, for identifying priorities for construction projects, and for taking into account the interests and capability of households with respect to different types of housing, and for evaluating a potential market for the newly constructed housing.

Real estate brokers may find the estimates useful in selecting priority market segments for their activities, and identifying the household categories for specified types of housing. Real estate brokers will find it important to evaluate the effective demand (including the demand for mortgage loans) in different segments of the housing market. These are the factors which determine potential volume of activities and the marketing strategy of these companies.

The selection of Moscow as the main site for the evaluations was driven by several reasons:

1. The availability of many banks which originate residential mortgage loans and have accumulated some experience in this area.
2. The broad variety of mortgage products offered to the households; the broad use of "traditional" mortgage lending schemes; and the predominance of market-oriented lending models.

3. The big volume of residential mortgage lending as compared to other cities of Russia. According to the data of the RF Central Bank, loans originated in Moscow (city and oblast) constitute about 80 percent of all loans originated in Russia in 2001-2002.¹
4. The availability of active primary and secondary housing markets.
5. The availability of statistical data on the housing market and mortgage lending activities, household incomes, and household survey data.
6. The high demand for home mortgages among the residents, high income levels, and substantial household savings.
7. Taken together, these factors permit characterizing Moscow as a city with a developing residential mortgage market, and make it possible to construct a simulation model for assessing housing affordability and market demand for housing with respect to different mortgage instruments and subsidy programs.

The evaluation of housing affordability under various mortgage programs was made for the mortgage products which:

- are most typical for the Moscow's market for home mortgages;
- are offered by key market players, who are responsible for the greater portion of home mortgages originated to the households;
- differ in key program parameters; and
- are targeted to different consumer groups.

The mortgage products selected for the analysis were those offered by the key players on the residential mortgage market: Sberbank of Russia, DeltaCredit, and Raiffeisenbank. These banks issue about 90 percent of all mortgages in Moscow. It should be noted, however, that these banks focus on different household categories. The basic program of DeltaCredit is intended for middle-class borrowers. Raiffeisenbank gives preference to borrowers employed by their corporate clients (a letter of recommendation is required), or their own clients. Raiffeisenbank is oriented toward high-income households: the minimum loan is 25 thousand dollars, required downpayment is 30 percent of the cost of the new unit, and the interest rate is 12 percent annually.

When analyzing the affordability of the home mortgages offered by Sberbank of Russia, one should bear in mind that the bank is oriented toward a broad range of households. Therefore, the bank's mortgage program was used as the basis for evaluating the efficiency of downpayment subsidies for the purpose of expanding the range of households who can afford a mortgage loan.

In addition, we have analyzed the affordability of the mortgage products offered by the Agency for Housing Mortgage Lending (AHML), because this program enjoys governmental support and is oriented more toward the regional market, rather than the Moscow market – at this time AHML has cooperation agreements with over 50 regions.

The research also included the program of the Moscow Mortgage Agency (MIA), because this program is supported by the city authorities and affects the state of the local mortgage markets.

The evaluation also included some products offered by new market players who have announced large-scale plans for this activity and have adequate resources for pursuing it. These include the program of the National Mortgage Company (a company created by the National Reserve Bank), which is targeted to young people without adequate savings for the downpayment in case of a mortgage loan covering from 20 to 30 percent of apartment price.

¹ *Vestnik* of the Central Bank of Russia, No. 56 (708), October 15, 2003.

The mortgage product offered by the National Mortgage Company – *Molodezhny* – allows for a downpayment as low as 5 percent of the apartment price. The loan has two interest rates: one for the period until 25 percent of the price is paid (16 percent), and the other for the remaining life of the loan (13 percent annually in hard currency terms). The loan may be issued for the term of up to 10 years.

The affordability of mortgages for different income groups was evaluated with the use of various scenarios which combine mortgage lending and subsidizing (downpayment subsidies or interest rate subsidies).

Table 2. Key Program Parameters

	Delta	Raiffeizen	AHML ²	MIA	NMC	Sberbank with subsidy
	R001	R002	R003	R004	R005	R006
Interest rate, % per year	12	12	15	15	16	11
Loan term, years	10	10	20	10	10	15
Minimum amount of a loan, thou. \$	17	25	—	3	15	—
Maximum amount of a loan, thou. \$	200	400	—	150	200	—
Maximum Loan to value ratio, %	85	70	70	70	95	70
Maximum Payments to income ratio, %	40	30	30	40	35	30
A one-time payment collected by the bank for the execution of a loan transaction (underwriting, application, contracting procedures, etc.), \$	—	500	—	35	250	—
Money paid to an appraiser for assessment of the property value and issuance of an appraisal report, \$	100	100	100	100	115	100
Money paid to a real estate broker for services on property selection and execution of a contract for sale of it, % of unit value	5	5	5	5	5	5
Annual mortgage property insurance, title risk insurance and borrower's life and disability insurance payments, % of loan amount per year	1.65	1.65	1.65	1.65	1.32	1.65
A state tax paid for the notary certification of the mortgage agreement, % of unit value	1.5	1.5	1.5	1.5	1.5	1.5
A state tax paid for the state registration of the mortgage agreement, \$	10	10	10	10	20	10
Minimum borrower's age (at the date of application)	18	20	20	20	18	18
Maximum borrower's age (at the date of application)	50	50	55	50	30	55
Down payment subsidy, % of unit value	—	—	—	—	—	35 ³

Analysis of the Results

Our analysis will proceed as follows:

1. Assessing the maximum capacity of the mortgage market and analyzing the structure of the households which can afford a mortgage loan.

² The program issues ruble loans. However, for the purpose of comparison all indicators were calculated according to the exchange rate of 31.1025 rubles per 1 US dollar.

³ The subsidy covers 35 percent of the normative price of a standard apartment. The apartment size depends on the size of the household: 36 sq.m. for one person; 42 sq.m. for two persons, and 18 sq.m. of total floor space per person for a household of 3 or more persons. The price is taken as the average market price established by Gosstroï of Russia on a quarterly basis.

2. Assessing the potential demand for housing and for mortgage loans in Moscow with respect to the mortgage products reviewed. Analyzing the structure of the households which are able to purchase a unit and improve their living conditions.
3. Assessing the potential demand for housing and for mortgage loans at each of the three segments of the housing market: low-priced housing, modestly-priced housing, and median-priced housing.
4. Evaluating the efficiency of subsidies (if applicable).
5. Comparing the effect of the mortgage programs reviewed on the affordability of housing and the improvement of living conditions.

Overall housing affordability indicators for Moscow take into account both households which can take a home mortgage and households which cannot take a mortgage but may be still able to improve their living conditions because of substantial savings.

In the event a mortgage is not available, only 1.9 percent of tenants and splitters will be able to improve their living conditions (by exercising the “new purchase” option). Over 20 percent of the households will be able to improve their living conditions without taking a mortgage if they manage to sell their current unit (see Table 3). The structure of households which can improve their living conditions is given in Table 4.

These considerations should be taken into account when analyzing the impact of mortgage programs on the affordability of housing.

Table 3. Estimated Demand for Housing If Mortgage Is Not Available

	New purchase	Trade up
Share of households that can buy a unit, %	1.9	20.36
Median-priced unit	0.24	11.45
Modestly-priced unit	0.95	7.61
Low-priced unit	0.71	1.30
Share of low-income households that can buy a unit, %	0.00	0.00
Potential demand for housing, bln. \$	0.76	34.93

Table 4. Housing Affordability by Household Category

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	3.23	19.21
Individuals, % (all such households)	0.00	20.63
Other households, % (all such households)	1.15	21.09

1. The Mortgage Program of DeltaCredit Bank⁴

A. Maximum Market Capacity

Out of the total number of households acquiring a new unit (renters and splitters, representing 30.5 percent of all households) only 30 percent will be able to participate in the Delta Program. The maximum market for such loans is \$ 14 billion.

⁴ Hereinafter – the Delta Program

Households who will be able to take a mortgage constitute 25 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 40 billion.

Table 1.1. Maximum Capacity of the Mortgage Market⁵.

	New purchase	Trade up
Share of households that can afford a loan, %	31.28	25.72
Maximum loan capacity, bln. \$	13.83	39.69
Maximum demand for housing, bln. \$	19.37	170.85
Average loan size, thou. \$	50.79	54.20
Average LTV ratio, %	83.09	51.12

The allocation of mortgage loans among borrower income groups presented in Table 1.2 shows that in both cases a loan is affordable to high-income households (basically, 45 percent of the highest-income households). The Gini index, which reflects the disparity among households with different income levels with respect to the program reviewed, is rather high. The higher the value of the Gini index, the greater the estimated disparity. This means that the greater portion of the loans is used by a small group of high-income households, resulting in strong inequality.

Table 1.2. Participants of the Delta Program, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	272.26	732.23
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	4.13
3 group	39.19	125.82
4 group	107.26	286.70
5 group (Highest 20% of households)	125.82	315.58
Gini index	0.53	0.50
Total volume of loans, mln. \$	13.83	39.69
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	0.08
3 group	0.74	2.58
4 group	2.95	10.68
5 group (Highest 20% of households)	10.15	26.36
Gini index	0.67	0.64

If availability of mortgage loans is analyzed in terms of household income, a loan for the purchase of new housing will be available for about 30 percent of households with children and 60 percent of one-person households. The “trade-up” option increases the number of eligible households, while further increasing the percentage of low-income households which cannot take a mortgage, and thus the affordability indicators are lower.

⁵ The maximum loan capacity as well as the maximum demand for housing is determined according to the possibility of a household to apply for a loan regardless of its ability to buy a unit. These indicators count all households that can take a loan even if their money (savings plus loan) are not sufficient to buy any target unit.

Table 1.3. Affordability of Delta Mortgages, by Household Category

Share of households that can afford a loan	New purchase	Trade up
Households with kids, % (all such households)	29.68	34.45
Individuals, % (all such households)	60.00	15.25
Other households, % (all such households)	31.68	23.01

B. Potential Demand for Housing and Mortgage Loans. Housing Affordability

Under the Delta Program, only about 20 percent of the households may buy a new unit, and 33 percent will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (13 percent and 27 percent of all households, respectively). In case of a trade-up, the demand for low-priced units is low, because if the old unit is sold, the proceeds together with the loan will be enough to buy a more expensive unit.

In case of a “new purchase”, a loan is almost always necessary. Only 1.25 percent of home buyers make the purchase without taking a mortgage loan. In a “trade-up”, only 24 percent of the households will be unable to take a mortgage loan. While such households do not meet the lending standards, they typically have substantial savings for closing the transaction.

The potential demand for mortgages⁶ is \$ 11.5 billion and \$ 40 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated as \$ 14 billion and \$ 90 billion, respectively, or 72 percent and 50 percent of the maximum market capacity.

As noted above, this program is oriented toward moderate to medium income households. The eligibility limit for a household wishing to improve its living conditions through sale of the existing unit is \$ 700 per month, and a household wishing to purchase an additional unit will need an income of at least \$ 1,200 per month.

As of September 2003, total loans originated under the Delta Program amounted to \$ 73 million, or 0.2 percent of the potential demand for mortgage loans. The average loan size is \$ 36 thousand, which agrees with the estimated values (see Tables 1.7-1.9).

Table 1.4. Potential Demand for Housing in Moscow Under the Delta Program

	New purchase	Trade up
Share of households that can buy a unit, %	18.95	33.26
Median-priced unit	13.03	27.17
Modestly-priced unit	3.79	4.86
Low-priced unit	2.13	1.23
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	98.75	76.03
Potential demand for housing, bln. \$	13.90	89.86

⁶ Potential demand for housing and mortgages is the demand of households which can buy any target unit (low-priced, modestly-priced, or median-priced). In every case, these indicators are lower than the maximum lending capacity and the maximum demand for housing because some households are unable to buy any target unit.

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 1.1. 10 percent of the higher-income households account for over 50 percent of the potential demand, while over 40 percent of the households may not want or will not be able to take a mortgage. The Gini index reflecting this disparity (i.e., the uneven distribution of potential demand for mortgage loans) is fairly high.

Chart 1.1. Potential Demand for Mortgages in a Trade-Up

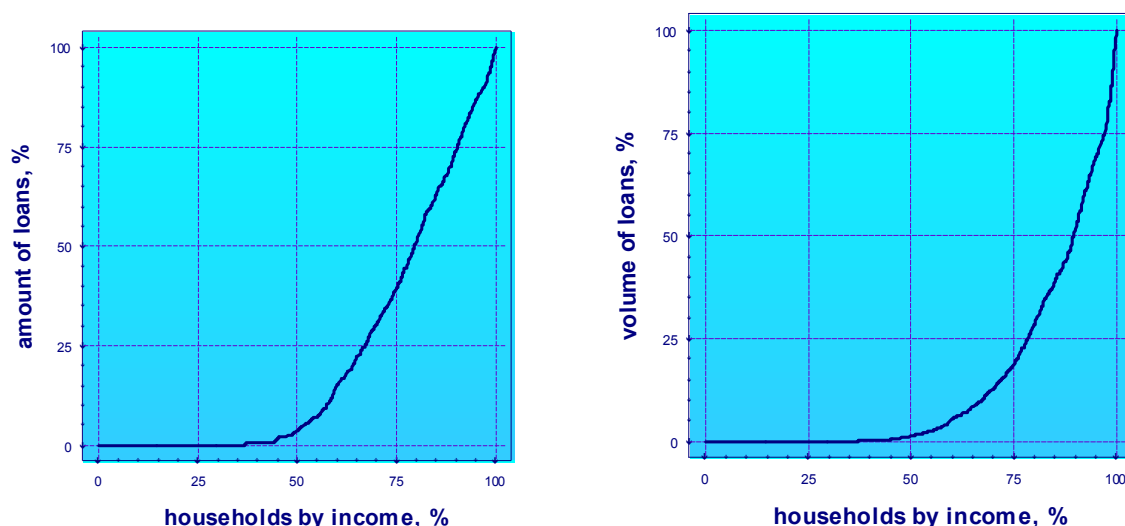


Table 1.5 shows the potential demand for Delta mortgages by income groups. Nearly every household eligible for a mortgage loan (see Table 1.2) will be able to improve its living conditions. In other words, mortgage loans under this program will be available, as a rule, only for households who are able to improve their living conditions with the help of the loan.

A comparison of the potential demand for mortgages among different income groups (Table 1.5) with the maximum market capacity of these groups (Table 1.2) reveals the following:

In case of a “new purchase”, 60 percent of eligible borrowers will be able to purchase a unit. They are represented mainly by households from the highest income group. For households in the third income group and most households in the fourth income group the maximum loan amount is insufficient for purchasing a unit.

In case of a “trade-up”, practically all (over 98 percent) eligible borrowers will be able to improve their living conditions.

Table 1.5. Potential Demand for Delta Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	162.95	719.85
1 group (lowest 20% of households)	0.00	0.00
2 group	0.00	4.13
3 group	0.00	123.76
4 group	37.13	282.58
5 group (highest 20% of households)	125.82	309.39
Gini index	0.70	0.38

Total volume of loans, mln. \$	11.48	39.39
1 group (lowest 20% of households)	0.00	0.00
2 group	0.00	0.08
3 group	0.00	2.53
4 group	1.33	10.59
5 group (highest 20% of households)	10.15	26.19
Gini index	0.75	0.64

Table 1.6 shows the affordability of a new unit for different types of household calculated as a percentage of the total households in a group considering this option for improving their living conditions.

Table 1.6. Affordability of Housing in Moscow for Different Households Under the Delta Program

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	17.42	36.33
Individuals, % (all such households)	60.00	28.25
Other households, % (all such households)	19.08	32.74

Tables 1.7 – 1.9 below give estimates for the potential demand for housing and mortgages for each of the three market segments of “target dwellings” reviewed (low-priced units, modestly-priced units, and median-priced units).

Table 1.7. Potential Demand for Median-Priced Units in Moscow Under the Delta Program

	New purchase	Trade up
Share of households that can buy a “median-priced” unit, %	13.03	27.17
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	88.00
Potential demand for “median-priced” units, bln. \$	11.59	81.72
Potential demand for mortgages, bln. \$	9.64	38.35
Average loan size, thou. \$	84.97	56.34
Average LTV ratio, %	83.20	50.90
Minimum household income, \$	1,898	694

Table 1.8. Potential Demand for Modestly-Priced Units in Moscow Under the Delta Program

	New purchase	Trade up
Share of households that can buy a “modestly-priced” unit, %	3.79	4.86
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	93.75	23.88
Potential demand for “modestly-priced” units, bln. \$	1.57	6.76
Potential demand for mortgages, bln. \$	1.22	0.84
Average loan size, thou. \$	39.50	25.57

Average LTV ratio, %	83.20	49.78
Minimum household income, \$	1,400	750

Table 1.9. Potential Demand for Low-Priced Units in Moscow Under the Delta Program

	New purchase	Trade up
Share of households that can buy a “low-priced” unit, %	2.13	1.23
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	17.65
Potential demand for “low-priced” units, bln. \$	0.74	1.38
Potential demand for mortgages, bln. \$	0.62	0.20
Average loan size, thou. \$	33.20	31.99
Average LTV ratio, %	82.75	83.13
Minimum household income, \$	1,271	1,201

The greater portion of the potential demand for housing is taken up by the market for median-priced units, because the gap between a low-priced and a median-priced unit is not big (about \$ 20 thousand), and households which are eligible for a mortgage (for \$ 15 thousand or higher) have sufficient savings and equity from the sale of the existing unit for buying a median priced unit.

2. The Mortgage Program of Raiffeizenbank

A. Maximum Market Capacity

Out of the total number of households acquiring a new unit (30.5 percent of all households), only 30 percent will be able to participate in the Delta Program. The maximum market for such loans is \$ 4 billion.

Households who will be able to take a mortgage constitute 25 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 23 billion.

Table 2.1. Maximum Capacity of the Mortgage Market

	New purchase	Trade up
Share of households that can afford a loan, %	10.43	15.00
Maximum loan capacity, bln. \$	4.16	23.43
Maximum demand for housing, bln. \$	10.30	155.47
Average loan size, thou. \$	45.80	54.87
Average LTV ratio, %	68.66	48.59

The allocation of mortgage loans among income groups (Table 2.2) shows that in both cases only high-income households (20 – 25 percent of households with the highest income) will be able to take a loan.

Table 2.2. Raiffeizenbank Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	90.75	426.96
1 group (lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	0.00
4 group	0.00	152.63
5 group (highest 20% of households)	90.75	274.33
Gini index	0.80	0.66
Total volume of loans, mln. \$	4.16	23.43
1 group (lowest 20% of household)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	0.00
4 group	0.00	5.23
5 group (highest 20% of households)	4.16	18.20
Gini index	0.80	0.71

If availability of mortgage loans is analyzed in terms of household income, a loan for the purchase of new housing will be available for about 10 percent of households with children and 60 percent of one-person households. The “trade-up” option has higher affordability indicators because household savings are the key factor in determining the loan size. For example, a household with an income of \$ 750 per month may expect a loan of \$ 14.4 thousand. The household will need at least \$ 6.2 thousand in savings, not taking into account transaction costs. However, if the has only 4 5.3 thousand (of which at least \$ 1 thousand will have to be paid for various fees if the loan gets approved, the household should expect a smaller loan (\$ 8.9 thousand). However, proceeds from the sale of the existing unit may give the household sufficient equity to take a \$ 14.4 thousand loan.

Table 2.3. Affordability of Raiffeizenbank Mortgages, by Household Category

Share of households that can afford a loan	New purchase	Trade up
Households with kids, % (all such households)	10.32	20.25
Individuals, % (all such households)	20.00	7.62
Other households, % (all such households)	10.31	13.72

B. Potential Demand for Housing and Mortgage Loans. Housing Affordability

Under the Raiffeizenbank Program, only about 10 percent of the households may buy a new unit, and 23 percent will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (5 percent and 18 percent of all households, respectively).

In case of a “new purchase”, a availability to take a loan is almost always necessary. Only 2 percent of home buyers make the purchase without taking a mortgage loan. In a “trade-up”, 36 percent of the households will be unable to take a mortgage loan. While such households do not meet the lending standards, they typically have substantial savings for closing the transaction.

The potential demand for mortgages is \$ 4 billion and \$ 23 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated as \$ 6 billion and \$ 62 billion, respectively, or 60 percent and 40 percent of the maximum market capacity.

As noted above, this program is oriented toward medium income households. The eligibility limit for a household wishing to improve its living conditions through sale of the existing unit is \$ 1,200 per month, and a household wishing to purchase an additional unit will need an income of \$ 2,000 per month.

As of September 2003, total loans originated under the Raiffeisenbank program amounted to \$ 20 million, or 0.1 percent of the potential demand for mortgage loans. The average loan size is \$ 44.4 thousand, which agrees with the estimated values (see Tables 2.7-2.9).

Table 2.4. Potential Demand for Housing in Moscow Under the Raiffeisenbank Program.

	New purchase	Trade up
Share of households that can buy a unit, %	10.66	23.48
Median-priced unit	5.21	18.19
Modestly-priced unit	2.61	4.06
Low-priced unit	2.84	1.23
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	97.77	63.89
Potential demand for housing, bln. \$	6.15	61.56
Potential demand for mortgages, bln. \$	4.16	23.43
Share of potential demand for housing in maximum capacity, %	59.71	39.60
Minimum household income, \$	2,055	1,201

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 2.1. 15 percent of the higher-income households account for over 50 percent of the potential demand, while over 60 percent of the households will not apply for a mortgage.

Chart 2.1. Potential Demand for Mortgages in a Trade-Up

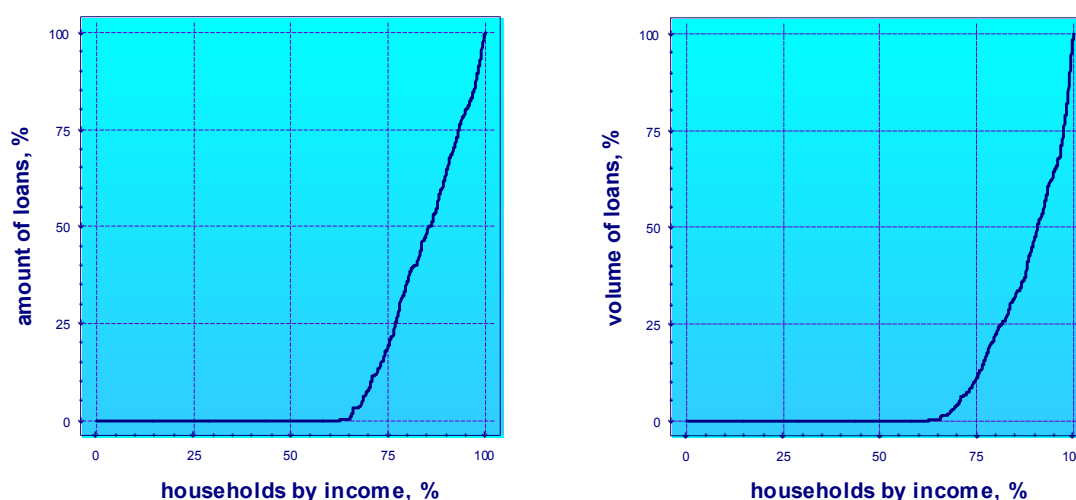


Table 2.5 shows the potential demand for Raiffeisenbank mortgages by income groups. Every household eligible for a mortgage loan (see Table 2.2) will be able to improve its living

conditions. In other words, mortgage loans under this program will be available, as a rule, only for households who are able to improve their living conditions with the help of the loan.

Table 2.5. Potential Demand for Raiffeizenbank Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	90.75	426.96
1 group (lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	0.00
4 group	0.00	152.63
5 group (highest 20% of households)	90.75	274.33
Gini index	0.78	0.42
Total volume of loans, mln. \$	4.16	23.43
1 group (lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	0.00
4 group	0.00	5.23
5 group (highest 20% of households)	4.16	18.20
Gini index	0.80	0.71

Table 2.6 shows the affordability of a new unit for different household groups calculated as a percentage of the total households in a group considering this option for improving their living conditions.

Table 2.6. Affordability of Housing in Moscow for Different Households Under the Raiffeizenbank Program.

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	10.32	22.55
Individuals, % (all such households)	20.00	22.42
Other households, % (all such households)	10.69	24.48

Tables 2.7 – 2.9 below give estimates for the potential demand for housing and mortgages for each of the three market segments reviewed (low-priced units, modestly-priced units, and median-priced units).

Table 2.7. Potential Demand for Median-Priced Units in Moscow Under the Raiffeizenbank Program

	New purchase	Trade up
Share of households that can buy a “median-priced” unit, %	5.21	18.19
Share of low-income households that can buy house, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	80.88
Potential demand for “median-priced” units, bln. \$	4.10	54.63
Potential demand for mortgages, bln. \$	2.82	23.19

Average loan size, thou. \$	62.08	55.39
Average LTV ratio, %	68.66	48.44
Minimum household income, \$	3,072	1,337

Table 2.8. Potential Demand for Modestly-Priced Units in Moscow Under the Raiffeizenbank Program

	New purchase	Trade up
Share of households that can buy a “modestly-priced” unit, %	2.61	4.06
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	90.91	3.57
Potential demand for “modestly-priced” units, bln. \$	1.05	5.54
Potential demand for mortgages, bln. \$	0.66	0.13
Average loan size, thou. \$	31.85	30.36
Average LTV ratio, %	68.66	68.66
Minimum household income, \$	2,391	1,265

Table 2.9. Potential Demand for Low-Priced Units in Moscow Under the Raiffeizenbank Program

Share of households that can buy a “low-priced” unit, %	2.84	1.23
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	11.76
Potential demand for “low-priced” units, bln. \$	0.99	1.39
Potential demand for mortgages, bln. \$	0.68	0.11
Average loan size, thou. \$	27.58	27.18
Average LTV ratio, %	68.66	68.66
Minimum household income, \$	2,055	1,201

The greater portion of the potential demand for housing is taken up by the market for median-priced units, because the gap between a low-priced and a median-priced unit is not big (about \$ 20 thousand), and households which are eligible for a mortgage (for \$ 25 thousand or higher) have sufficient savings and equity from the sale of the existing unit for buying a median priced unit.

3. The Mortgage Program of the Agency for Housing Mortgage Lending⁷

A. Maximum Market Capacity

Out of the total number of households acquiring a new unit (30.5 percent of all households), about 85 percent will be able to participate in the AHML Program. The maximum market for such loans is \$ 10.5 billion.

⁷ Hereinafter – AHML Program

Households who will be able to take a mortgage constitute 65 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 24 billion.

Table 3.1. Maximum Capacity of the Mortgage Market

	New purchase	Trade up
Share of households that can afford a loan, %	84.12	64.64
Maximum loan capacity, bln. \$	10.49	43.73
Maximum demand for housing, bln. \$	16.20	174.51
Average loan size, thou. \$	14.33	23.77
Average LTV ratio, %	68.66	33.52

The allocation of mortgage loans among borrower income groups presented in Table 3.2 shows that in both cases a loan is affordable to all income groups.

Table 3.2. AHML Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	732.23	1 839.85
1 group (lowest 20% of households)	140.26	330.02
2 group	146.45	360.96
3 group	148.51	396.02
4 group	144.38	371.27
5 group (highest 20% of households)	152.63	381.58
Gini index	0.01	0.02
Total volume of loans, mln. \$	10.49	43.73
1 group (lowest 20% of household)	0.48	1.54
2 group	0.80	2.73
3 group	1.17	4.93
4 group	2.02	10.22
5 group (highest 20% of households)	6.03	24.31
Gini index	0.47	0.48

From the viewpoint of access to mortgage by different household categories, practically all households with children will be able to obtain a loan.

Table 3.3. Affordability of AHML Mortgages, by Household Category

Share of households that can afford a loan	New purchase	Trade up
Households with kids, % (all such households)	84.52	92.48
Individuals, % (all such households)	60.00	30.49
Other households, % (all such households)	84.35	56.19

B. Potential Demand for Housing and Mortgage Loans. Housing Affordability

Under the AHML Program, about 15 percent of the households may buy a new unit, and 45 percent will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (6 percent and 33 percent of all households, respectively). In case of a trade-up, the demand for low-priced units is low, because

if the old unit is sold, the proceeds together with the loan will be enough to buy a more expensive unit.

In case of a “new purchase”, a loan is almost always necessary. Only 1.5 percent of home buyers make the purchase without taking a mortgage loan. In a “trade-up”, 12 percent of the households will be unable to take a mortgage loan. While such households do not meet the lending standards, they typically have substantial savings for closing the transaction.

The potential demand for mortgages is \$ 5.4 billion and \$ 40 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated at \$ 8 billion and \$ 107 billion, respectively, or 49 percent and 61 percent of the maximum market capacity.

The program is oriented toward moderate to medium income households. The eligibility limit for a household wishing to improve its living conditions through sale of the existing unit is \$ 350 per month, and a household wishing to purchase an additional unit will need an income of at least \$ 1,900 per month. Out of the total number of households purchasing housing, about 1,5% are low-income households⁸.

According to AHML, the program is focused at households with the average monthly income of \$ 300, which agrees with our estimates. As of September 2003, total loans originated under the AHML Program amounted to \$ 7.4 million, or 0.02 percent of the potential demand for mortgage loans. The average loan size is \$ 10 thousand, which agrees with the estimated values (see Tables 3.7-3.9).

Table 3.4. Potential Demand for Housing in Moscow Under the AHML Program

	New purchase	Trade up
Share of households that can buy a unit, %	14.45	46.66
Median-priced unit	5.92	33.04
Modestly-priced unit	5.45	11.59
Low-priced unit	3.08	2.03
Share of low-income households that can buy a unit, %	0.00	1.52
Share of households that can apply for mortgages, % of households that can buy a unit	98.36	88.51
Potential demand for housing, bln. \$	7.94	107.22
Potential demand for mortgages, bln. \$	5.39	39.49
Share of potential demand for housing in maximum capacity, %	49.03	61.44
Minimum household income, \$	1 907	350

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 3.1. 20 percent of the higher-income households account for over 50 percent of the potential demand, while over 30 percent of the households will not apply for a loan.

Chart 3.1. Potential Demand for Mortgages in a Trade-Up

⁸ Households in the lowest 30 percent of the income distribution

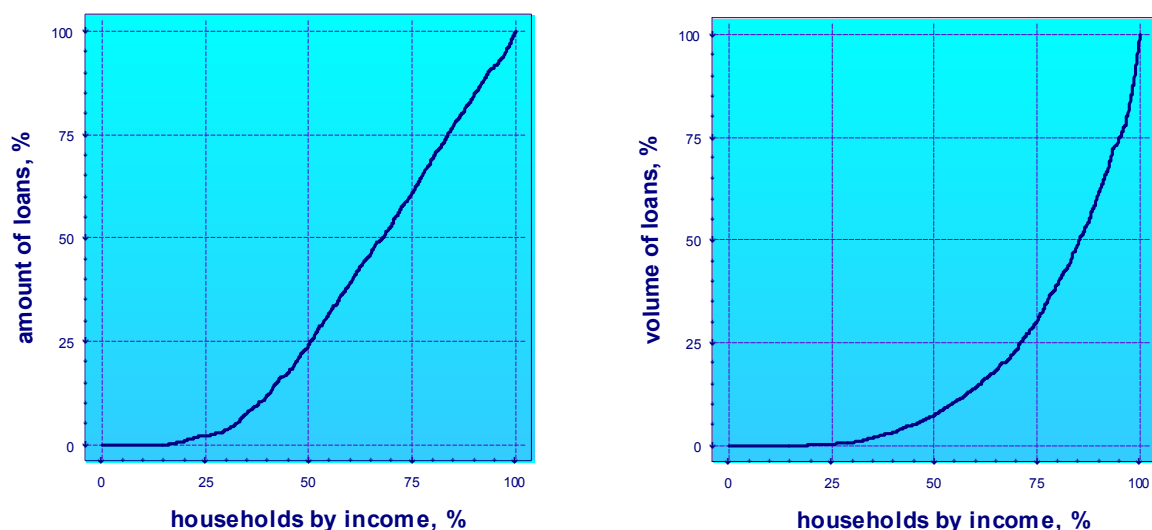


Table 3.5 shows the potential demand for AHML mortgages by income groups. In case of a “new purchase”, only 17 percent of eligible borrowers (see Table 3.2) will actually be able to purchase a unit. For a trade-up, this indicator is 64 percent. In other words, mortgages offered by this program are, as a rule, affordable, but the majority of eligible households will be unable to obtain a loan in the amount required to purchase a unit.

Table 3.5. Potential Demand for AHML Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	123.76	1 175.69
1 group (lowest 20% of households)	0.00	10.31
2 group	0.00	127.88
3 group	0.00	321.77
4 group	2.06	354.77
5 group (highest 20% of households)	121.69	360.96
Gini index	0.78	0.28
Total volume of loans, mln. \$	5.39	39.49
1 group (lowest 20% of household)	0.00	0.08
2 group	0.00	1.16
3 group	0.00	4.34
4 group	0.05	9.98
5 group (highest 20% of households)	5.33	23.94
Gini index	0.80	0.57

Table 3.6 shows the affordability of a new unit for different household groups calculated as a percentage of the total households in a group considering this option for improving their living conditions.

Table 3.6. Affordability of Housing in Moscow Under the AHML Program

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	12.26	53.03
Individuals, % (all such households)	20.00	31.84
Other households, % (all such households)	15.65	47.05

Tables 3.7 – 3.9 below give estimates for the potential demand for housing and mortgages for each of the three market segments reviewed (low-priced units, modestly-priced units, and median-priced units).

Table 3.7. Potential Demand for Median-Priced Units in Moscow Under the AHML Program

Share of households that can buy a “median-priced” unit, %	5.92	33.04
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	93.86
Potential demand for “median-priced” housing, bln. \$	4.67	88.96
Potential demand for mortgages, bln. \$	3.21	36.15
Average loan size, thou. \$	62.17	40.95
Average LTV ratio, %	68.66	42.57
Minimum household income, \$	3 005	462

Table 3.8. Potential Demand for Modestly-Priced Units in Moscow Under the AHML Program.

	New purchase	Trade up
Share of households that can buy a “modestly-priced” unit, %	5.45	11.59
Share of low-income households that can buy a unit, %	0.00	8.13
Share of households that can apply for mortgages, % of households that can buy a unit	95.65	78.13
Potential demand for “modestly-priced” housing, bln. \$	2.23	15.97
Potential demand for mortgages, bln. \$	1.47	3.03
Average loan size, thou. \$	32.31	11.77
Average LTV ratio, %	68.66	24.23
Minimum household income, \$	2 223	355

Table 3.9. Potential Demand for Low-Priced Units in Moscow Under the AHML Program

	New purchase	Trade up
Share of households that can buy a “low-priced” unit, %	3.08	2.03
Share of low-income households that can buy a unit, %	0.00	28.57
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	60.71
Potential demand for “low-priced” housing, bln. \$	1.04	2.29
Potential demand for mortgages, bln. \$	0.71	0.31
Average loan size, thou. \$	26.65	8.93
Average LTV ratio, %	68.66	22.56
Minimum household income, \$	1 907	350

A greater portion of the potential demand for housing goes to the “median-priced” and “modestly-priced” market segments, because the price gap between a “low-priced” and “modestly-priced” unit is small (about \$ 7 thousand) households who are able to improve their living conditions are most likely to be able to finance this gap and buy a more expensive unit. Low-income households mostly purchase “low-priced” and “modestly-priced” housing (30% and 8% of the total number of transactions, respectively).

4. The Mortgage Program of the Moscow Mortgage Agency⁹

A. Maximum Market Capacity

Out of the total number of households acquiring a new unit (30.5 percent of all households), about 60 percent will be able to participate in the MIA Program. The maximum market for such loans is \$ 8 billion.

Households who will be able to take a mortgage constitute 50 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 40 billion.

Table 4.1. Maximum Capacity of the Mortgage Market

	New purchase	Trade up
Share of households that can afford a loan, %	63.03	51.30
Maximum loan capacity, bln. \$	8.28	39.28
Maximum demand for housing, bln. \$	14.13	170.34
Average loan size, thou. \$	15.08	26.90
Average LTV ratio, %	68.66	35.95

The allocation of mortgage loans among borrower income groups presented in Table 4.2 shows that in both cases a loan is affordable to all income groups. In this respect, the MIA Program is very similar to the AHML Program.

Table 4.2. MIA Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	548.65	1 460.33
1 group (Lowest 20% of households)	90.75	255.76
2 group	119.63	290.83
3 group	115.51	317.64
4 group	105.19	292.89
5 group (Highest 20% of households)	117.57	303.20
Gini index	0.03	0.03
Total volume of loans, mln. \$	8.28	39.28
1 group (Lowest 20% of households)	0.35	1.46
2 group	0.66	2.54
3 group	0.92	4.46
4 group	1.49	9.14
5 group (Highest 20% of households)	4.86	21.69

⁹ Hereinafter – the MIA Program

Gini index	0.48	0.48
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From the viewpoint of access to mortgage by different household categories, practically all households with children will be able to obtain a loan.

Table 3.3. Affordability of MIA Mortgages, by Household Category

Share of households that can afford a loan	New purchase	Trade up
Households with kids, % (all such households)	72.26	83.51
Individuals, % (all such households)	60.00	20.18
Other households, % (all such households)	57.63	38.79

B. Potential Demand for Housing and Mortgage Loans, and Housing Affordability

Under the MIA Program, about 12 percent of the households may buy a new unit, and 43 percent will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (5 percent and 30 percent of all households, respectively). In case of a trade-up, the demand for low-priced units is low, because if the old unit is sold, the proceeds together with the loan will be enough to buy a more expensive unit.

In case of a “new purchase”, a loan is almost always necessary. Only 2 percent of home buyers make the purchase without taking a mortgage loan. In a “trade-up”, 19 percent of the households will be unable to take a mortgage loan. While such households do not meet the lending standards, they typically have substantial savings for closing the transaction.

The potential demand for mortgages is \$ 4.5 billion and \$ 35 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated at \$ 6.5 billion and \$ 100 billion, respectively, or 46 percent and 58 percent of the maximum market capacity.

Same as the AHML Program, the program is oriented toward moderate to medium income households. The eligibility limit for a household wishing to improve its living conditions through sale of the existing unit is \$ 290 per month, and a household wishing to purchase an additional unit will need an income of at least \$ 1,900 per month.

The program gives moderate-income households¹⁰ a chance to improve their living conditions. These households constitute about 1.74 percent of all households capable of improving their living conditions. For these households, an increase in the maximum share of loan payments in the household income (40 percent against the 30 percent in the AHML Program) is more important than the reduction of the loan term (10 years against the 20 years in the AHML Program).

According to MIA, as of September 2003, total volume of originated loans amounted to \$ 1.1 million, or less than 0,01 percent of the potential demand for mortgage loans.

¹⁰ Households in the 30 percent lowest-income group.

Table 4.4. Potential Demand for Housing in Moscow Under the MIA Program

	New purchase	Trade up
Share of households that can buy a unit, %	11.61	43.04
Median-priced unit	5.21	29.78
Modestly-priced unit	4.03	11.30
Low-priced unit	2.37	1.96
Share of low-income households that can buy a unit, %	0.00	1.74
Share of households that can apply for mortgages, % of households that can buy a unit	97.96	80.47
Potential demand for housing, bln. \$	6.57	99.21
Potential demand for mortgages, bln. \$	4.45	35.85
Share of potential demand for housing in maximum capacity, %	46.53	58.24
Minimum household income, \$	1 926	290

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 4.1. 10-20 percent of the higher-income households account for over 50 percent of the potential demand, while over 20 percent of the households will not apply for a loan.

Chart 4.1. Potential Demand for Mortgages in a Trade-Up

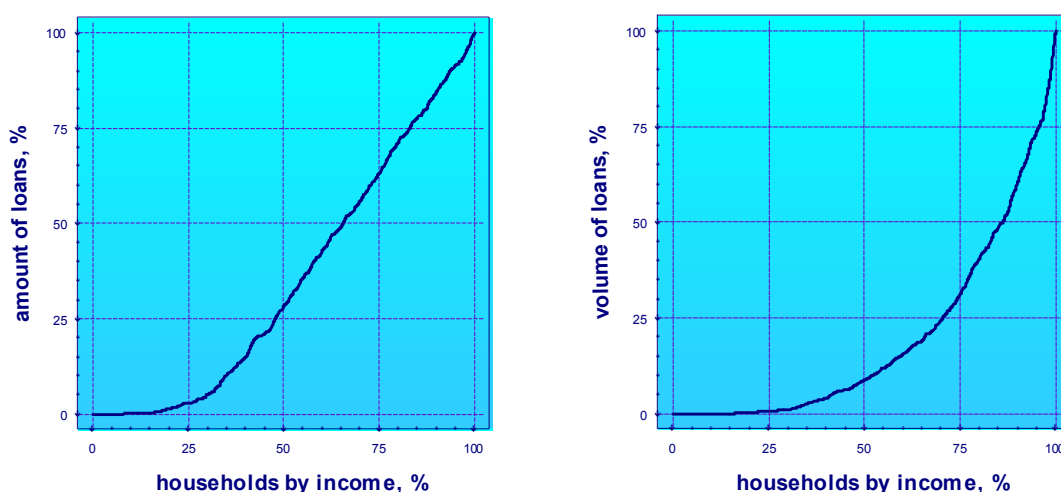


Table 4.5 shows the potential demand for MIA mortgages by income groups. In case of a “new purchase”, only 18 percent of eligible borrowers (see Table 3.2) will actually be able to purchase a unit. For a trade-up, this indicator is 68 percent. In other words, mortgages offered by this program are, as a rule, affordable, but the majority of eligible households will be unable to obtain a loan in the amount required to purchase a unit.

Table 4.5. Potential Demand for AHML Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	99.01	985.93

1 group (Lowest 20% of households)	0.00	14.44
2 group	0.00	132.01
3 group	0.00	274.33
4 group	2.06	282.58
5 group (Highest 20% of households)	96.94	282.58
Gini index	0.78	0.22
Total volume of loans, mln. \$	4.45	35.85
1 group (Lowest 20% of households)	0.00	0.11
2 group	0.00	1.32
3 group	0.00	4.12
4 group	0.05	8.98
5 group (Highest 20% of households)	4.40	21.32
Gini index	0.80	0.56

Table 4.6 shows the affordability of a new unit for different household groups calculated as a percentage of the total households in a group considering this option for improving their living conditions.

Table 4.6. Affordability of Housing in Moscow Under the MIA Program.

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	10.97	54.28
Individuals, % (all such households)	20.00	28.70
Other households, % (all such households)	11.83	39.82

Tables 4.7 – 4.9 below give estimates for the potential demand for housing and mortgages for each of the three market segments reviewed (low-priced units, modestly-priced units, and median-priced units).

As noted above, the MIA Program helps some households with moderate to low incomes to improve their living conditions. Such households typically show demand for modestly-priced and low-priced units.

Table 4.7. Potential Demand for Median-Priced Units in Moscow Under the MIA Program

	New purchase	Trade up
Share of households that can buy a “median-priced” unit, %	5.21	29.78
Share of low-income households that can buy a unit, %	0.00	0.49
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	88.32
Potential demand for “median-priced” housing, bln. \$	4.16	81.32
Potential demand for mortgages, bln. \$	2.86	33.01
Average loan size, thou. \$	62.97	44.09
Average LTV ratio, %	68.66	44.27
Minimum household income, \$	3 072	444

Table 4.8. Potential Demand for Modestly-Priced Units in Moscow Under the MIA Program

	New purchase	Trade up
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Share of households that can buy a “modestly-priced” unit, %	4.03	11.3
Share of low-income households that can buy a unit, %	0.00	10.90
Share of households that can apply for mortgages, % of households that can buy a unit	94.12	65.38
Potential demand for “modestly-priced” housing, bln. \$	1.61	15.69
Potential demand for mortgages, bln. \$	1.04	2.57
Average loan size, thou. \$	31.50	12.21
Average LTV ratio, %	68.66	24.87
Minimum household income, \$	2 223	335

Table 4.9. Potential Demand for Low-Priced Units in Moscow Under the MIA Program

	New purchase	Trade up
Share of households that can buy a “low-priced” unit %	2.37	1.96
Share of low-income households that can buy a unit, %	0.00	18.52
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	48.15
Potential demand for “low-priced” housing, bln. \$	0.80	2.20
Potential demand for mortgages, bln. \$	0.55	0.27
Average loan size, thou. \$	26.64	10.06
Average LTV ratio, %	68.66	25.52
Minimum household income, \$	1 926	290

A greater portion of the potential demand for housing goes to the “median-priced” and “modestly-priced” market segments, because the price gap between a “low-priced” and “modestly-priced” unit is small (about \$ 7 thousand) households who are able to improve their living conditions are most likely to be able to finance this gap and buy a more expensive unit.

5. The Mortgage Program of the National Mortgage Company¹¹

A. Maximum Market Capacity

This program is targeted to young people (aged 23 to 30). At least one person makes this category in 48 percent of the Moscow households. Thus the maximum participation rate possible is 48 percent, of which less than 10 percent may obtain a mortgage loan.

The factor curtailing the demand for mortgage loans in the high minimum loan (\$ 15 thousand). To be eligible for such loan, young people should have an income of at least \$ 750 per month.

Table 5.1. Household Structure in Moscow

Number of young members of the household	Percentage of total households
0	52
1	36
2	1.7

¹¹ Hereinafter – the NMC Program

3	0.3
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Out of the total number of households acquiring a new unit (77% percent of all relevant households, i.e., households which meet the program requirements), about 16 percent will be able to participate in the NMC Program. The maximum market for such loans is \$ 3 billion.

Households who will be able to take a mortgage constitute 8 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 5.5 billion.

Table 5.1. Maximum Capacity of the Mortgage Market

	New purchase	Trade up
Share of households that can afford a loan, %	15.79	8.31
Maximum loan capacity, bln. \$	3.11	5.51
Maximum capacity of demand for housing, bln. \$	9.35	138.93
Average loan size, thou. \$	47.16	48.54
Average LTV ratio, %	78.41	45.93

The allocation of mortgage loans among borrower income groups presented in Table 4.2 shows that in both cases a loan is affordable to households with high income levels.

Table 5.3. NMC Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	66.00	113.44
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	4.13	18.56
4 group	22.69	53.63
5 group (Highest 20% of households)	39.19	41.25
Gini index	0.61	0.48
Total volume of loans, mln. \$	3.11	5.51
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.07	0.33
4 group	0.48	1.93
5 group (Highest 20% of households)	2.56	3.25
Gini index	0.72	0.61

B. Potential Demand for Housing and Mortgage Loans. Housing Affordability

Under the NMC Program, new housing may be acquired by about 6 percent of all households in Moscow, of which only 80 percent will do it with the use of a mortgage loan. 22.4 percent of all households will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (4 percent and 14 percent of all households, respectively). In case of a trade-up, the demand for low-priced units is low,

because if the old unit is sold, the proceeds together with the loan will be enough to buy a more expensive unit.

The potential demand for mortgages is \$ 2.6 billion and \$ 5.5 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated at \$ 3.9 billion and \$ 43 billion, respectively, or 41 percent and 31 percent of the maximum market capacity.

The eligibility limit for a household wishing to improve its living conditions through sale of the existing unit is \$ 830 per month, and a household wishing to purchase an additional unit will need an income of over \$ 1,600 per month. These figures highlight the earlier conclusion is oriented exclusively toward young perspective people with high incomes.

According to NMC, as of September 2003, total volume of originated loans amounted to \$ 2 million, or 0.4 percent of the potential demand for mortgage loans. The average loan amount is \$ 40 thousand, which agrees with our estimates (see Tables 5.6-5.8).

Table 5.4. Potential Demand for Housing in Moscow Under the NMC Program

	New purchase	Trade up
Share of households that can buy a unit, % of all households	5.92	22.39
Median-priced unit	4.03	13.77
Modestly-priced unit	1.42	7.32
Low-priced unit	0.47	1.30
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	80.03	17.80
Potential demand for housing, bln. \$	3.86	43.18
Potential demand for mortgages, bln. \$	2.63	5.51
Share of potential demand for housing in maximum capacity, %	41.26	31.08
Minimum household income, \$	1 656	832

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 5.1. 15-20 percent of the higher-income households account for over 50 percent of the potential demand, while over 60 percent of the households will not apply for a loan.

Chart 4.1. Potential Demand for Mortgages in a Trade-Up

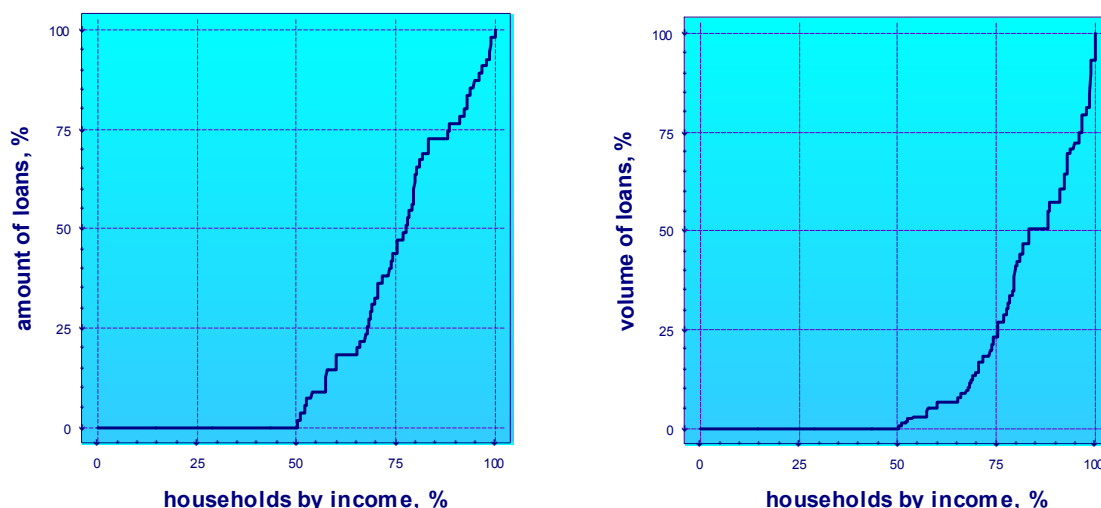


Table 5.5 shows the potential demand for NMC mortgages by income groups. All households eligible for a mortgage loan (see Table 5.3) will be able to improve their living conditions if they sell the exiting unit. If an additional unit is acquired, 60 percent of all borrowers will be able to close the transaction. In other words, under this program, mortgage loans can be obtained, as a rule, only by those households which have a housing unit and intend to sell it.

Table 5.5. Potential Demand for NMC Mortgages, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	41.25	113.44
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	18.56
4 group	2.06	53.63
5 group (Highest 20% of households)	39.19	41.25
Gini index	0.62	0.09
Total volume of loans, mln. \$	2.63	5.51
1 group (Lowest 20% of households)	0.00	0.00
2 group	0.00	0.00
3 group	0.00	0.33
4 group	0.07	1.93
5 group (Highest 20% households)	2.56	3.25
Gini index	0.79	0.61

Tables 5.6 – 5.8 below give estimates for the potential demand for housing and mortgages for each of the three market segments reviewed (low-priced units, modestly-priced units, and median-priced units). The figures are given as a percentage of the total households in Moscow.

As noted above, the NMC Program is oriented toward higher-income households, and thus nearly all demand for housing and mortgages goes to the “median-priced” market segment.

Table 5.6. Potential Demand for Median-Priced Units in Moscow Under the NMC Program

	New purchase	Trade up
Share of households that can buy a “median-priced” unit, %	4.03	13.77
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	94.12	27.89
Potential demand for “median-priced” housing, bln. \$	3.08	31.62
Potential demand for mortgages, bln. \$	2.32	5.39
Average loan size, thou. \$	70.32	49.29
Average LTV ratio, %	78.42	45.74
Minimum household income, \$	2 238	832

Table 5.7. Potential Demand for Modestly-Priced Units in Moscow Under the NMC Program

	New purchase	Trade up
Share of households that can buy a “modestly-priced” unit, %	1.42	7.32
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	50.00	1.98
Potential demand for “modestly-priced” housing, bln. \$	0.62	10.09
Potential demand for mortgages, bln. \$	0.24	0.12
Average loan size, thou. \$	38.61	28.69
Average LTV ratio, %	78.56	56.57
Minimum household income, \$	1 796	864

Table 5.9. Potential Demand for Low-Priced Units in Moscow Under the NMC Program

	New purchase	Trade up
Share of households that can buy a “low-priced” unit, %	0.47	1.30
Share of low-income households that can buy a unit, %	0.00	0.00
Share of households that can apply for mortgages, % of households that can buy a unit	50.00	0.00
Potential demand for “low-priced” housing, bln. \$	0.16	1.47
Potential demand for mortgages, bln. \$	0.07	0.00
Average loan size, thou. \$	31.71	0.00
Average LTV ratio, %	77.90	0.00
Minimum household income, \$	1 656	1 201

A greater portion of the potential demand for housing goes to the “median-priced” and “modestly-priced” market segments, because the price gap between a “low-priced” and “modestly-priced” unit is small (about \$ 7 thousand) households who are able to improve their living conditions are most likely to be able to finance this gap and buy a more expensive unit.

6. The Mortgage Program of the Sberbank of Russia Coupled with a Subsidy program for Households on the Waiting List for Improving their Living Conditions¹²

In assessing the affordability of mortgage loans for housing purchase issued by Sberbank of Russia, one should bear in mind that these products were designed for a broad range of prospective borrowers. The reason the Sberbank Program was used as the basis for assessing the efficiency of downpayment subsidies in expanding the range of eligible borrowers.

We will consider the subsidies allocated to households on the waiting list for improving their living conditions. Pursuant to the Moscow City Law, *On Improving the Living Conditions of Moscow's Residents*, as of January 15, 2003, "citizens shall be recognized as needing an improvement of their living conditions, if they have resided in Moscow for the total of at least 10 years and occupy premises of the size less than that established for the registration on the waiting-list, regardless of the ownership form..."¹³

As reported by the Moscow City Department for Housing Policy and the Housing Stock, as of September 2003 the waiting list for municipal housing has over 190 thousand households (about 7 percent of all households).

Households recognized as needing to improve their living conditions have the right to a gratuitous subsidy, the size of which depends on the time of the registration and population category (see Table 6.1).

The available household survey data and statistics do not allow for a reliable estimate of the order of priority and time of the registration on the waiting list, we will assume that an eligible household may receive a subsidy in the amount of 30 percent of the normative apartment price.

In accordance with the effective procedure, the subsidy size is determined as a percentage of the normative price of the housing provided, which is determined as a multiple of an average market price of one square meter of total floor space in standard mass developments, and the total floor space of the premises provided on the basis of the social standard for the household of a given size. – 18 square meters per one person in a household of three or more persons.

The size of the subsidy is calculated on the basis of social standard: 33 square meters of total floor space for a single person, and 42 square meters of total floor space for a household of two.

Table 6.1. Determination of the Size of the Subsidy to Persons on the Waiting List (as a percentage of the normative apartment price)

Waiting-time on the list (years)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 or more
Citizens eligible for improving their living conditions under general terms	0	5	7	10	14	19	25	32	40	49	59	70	75	80	85	90
Citizens eligible for a priority provision with housing	10	15	25	35	45	60	75	90	90	90	90	90	90	90	90	90

The subsidy may be provided to specified population categories (people on the waiting list, young people) without any regard for the actual ability of the recipient to improve the living

¹² Hereinafter – the Sberbank Program

¹³ The normative size for registering a household on the waiting list is less than 10 square meters of total floor space per one household member for individual apartments, and less than 15 meters for rooms in communal apartments (Chapter 2 of the Moscow City Law, *On Improving...*

conditions with the use of the subsidy funds. The subsidy covers from 5 to 90 percent of apartment price, and the remainder should be provided by the recipient at the expense of personal savings or a mortgage loan. Thus the right to the subsidy remains unrealized if eligible recipients have no savings or income for qualifying for a mortgage loan. Therefore, it appears more reasonable to improve the efficiency of budget funds by introducing a differentiated approach to the assistance provided to citizens for the improvement of their living conditions. Low-income citizens may be classified into a group eligible for social housing, while citizens with adequate income for obtaining a mortgage loan for the required amount may be classified as eligible for a subsidy and having real capability for buying an apartment by attracting additional funds.

A. Maximum Market Capacity

Out of the total number of households, who are able to acquire a new unit (30.5 percent of all households), about 86 percent will be able to participate in the Sberbank Program. The maximum market for such loans is \$ 11.5 billion.

Households who will be able to take a mortgage constitute 67 percent of the total households wishing to improve their living conditions with the use of the “trade-up” option. The maximum market is \$ 50 billion.

Table 6.2. Maximum Capacity of the Mortgage Market

	New purchase	Trade up
Share of households that can afford a loan, %	86.02	66.88
Maximum loan capacity, bln. \$	11.54	51.54
Maximum demand for housing, bln. \$	18.38	183.70
Average loan size, thou. \$	15.41	27.07
Average LTV ratio, %	65.99	36.18

The allocation of mortgage loans among borrower income groups presented in Table 6.3 shows that in both cases a loan is affordable to all income groups. The Gini index for the disparity of different income groups from the viewpoint of loan availability is close to zero when calculated on the basis of the number of loans issued. This means that practically all households have equal access to the mortgage loans. At the same time, the size of the loan they may obtain depends on household income, and thus higher-income households can obtain a bigger loan. The Gini index calculated on the basis of loan volume is much higher, reflecting the disparity in the availability of same-size loans.

Table 6.3. Participants of the Sberbank Program, by Income Groups

	New purchase	Trade up
Total number of loans, thou.	748.73	1 903.79
1 group (Lowest 20% of households)	144.38	336.21
2 group	150.57	377.46
3 group	148.51	410.46
4 group	148.51	385.71
5 group (Highest 20% of households)	156.76	393.96
Gini index	0.01	0.03
Total volume of loans, mln. \$	11.54	51.54
1 group (Lowest 20% of household)	0.54	1.80
2 group	0.87	3.24

3 group	1.26	5.83
4 group	2.16	12.25
5 group (Highest 20% of households)	6.70	28.41
Gini index	0.47	0.48

If availability of mortgage loans is analyzed in terms of household categories, practically all households with children are eligible for the loan. The situation is worse for individual borrowers, (i.e., one-person households: only 30 to 60 percent will be able to obtain a loan (depending on the acquisition option).

Table 6.4. Affordability of Sberbank Mortgages, by Household Category

Share of households that can afford a loan	New purchase	Trade up
Households with kids, % (all such households)	85.81	94.15
Individuals, % (all such households)	60.00	30.49
Other households, % (all such households)	86.64	59.59

B. Potential Demand for Housing and Mortgage Loans, and Housing Affordability

Under the Sberbank Program, about 20 percent of the households may buy a new unit, and 52 percent will be able to improve their living conditions by moving to another unit. The strongest demand is observed on the market for median-priced housing (6.5 percent and 40 percent of all households, respectively). In case of a trade-up, the demand for low-priced units is low, because if the old unit is sold, the proceeds together with the loan will be enough to buy a more expensive unit.

The potential demand for mortgages is \$ 6.3 billion and \$ 47.6 billion for “new purchase” and “trade-up”, respectively.

The potential demand for housing is estimated at \$ 9.5 billion and \$ 122.5 billion, respectively, or 52 percent and 67 percent of the maximum capacity of the mortgage market.

Similar to the AHML and MIA programs, this program is targeted to low and moderate-income households. The minimum income required for an improvement of the living conditions is \$ 100 per month; and households who want an additional apartment will need an income of at least \$ 740 per month.

The program, same as the MIA and AHML Program, makes an improvement in the living conditions possible for low-income households¹⁴ but, unlike the MIA Program which is a for-profit project, the Sberbank Program provides for subsidies to selected population categories (households on the waiting list). Low-income households which may improve their living conditions constitute 3.7 percent of all households able to improve their living conditions. For such households, buying a new apartment without selling the existing one remains unaffordable.

Table 6.5. Potential Demand for Housing in Moscow Under the Sberbank Program

	New purchase	Trade up
Share of households that can buy a unit, %	16.59	51.88
Median-priced unit	6.40	38.33
Modestly-priced unit	5.92	11.45

¹⁴ Households from the 30 percent group of lowest-income households.

Low-priced unit	4.27	2.10
Share of low-income households that can buy a unit, %	0.00	3.70
Share of households that can apply for mortgages, % of households that can buy a unit	97.15	90.09
Potential demand for housing, bln. \$	9.59	122.65
Potential demand for mortgages, bln. \$	6.32	47.64
Share of potential demand for houses in maximum capacity, %	52.20	66.77
Minimum household income, \$	739	104

The inequality in the distribution of potential demand for mortgages among the households is demonstrated by Chart 6.1. 20-40 percent of the higher-income households account for over 50 percent of the potential demand, while over 10 percent of the households will not apply for a loan.

Chart 6.1. Potential Demand for Mortgages in a Trade-Up

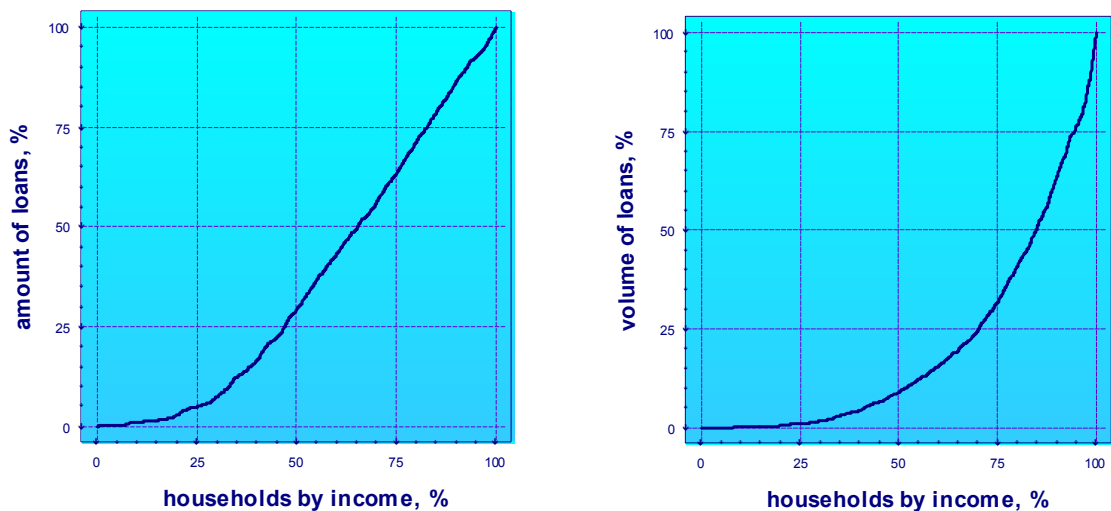


Table 6.6 shows the potential demand for Sberbank mortgages by income groups. In case of a “new purchase”, only 19 percent of eligible borrowers (see Table 6.3) will actually be able to purchase a unit. For a trade-up, this indicator is 70 percent. In other words, mortgages offered by this program are, as a rule, affordable, but the majority of eligible households will be unable to obtain a loan in the amount required to purchase a unit.

Table 6.6. Potential Demand for Sberbank Mortgages, By Income Groups

	New purchase	Trade up
Total number of loans, thou.	140.26	1 330.38
1 group (Lowest 20% of households)	0.00	39.19
2 group	0.00	179.45
3 group	8.25	354.77
4 group	8.25	375.39
5 group (Highest 20% of households)	123.76	381.58

Gini index	0.71	0.24
Total volume of loans, mln. \$	6.32	47.64
1 group (Lowest 20% of households)	0.00	0.26
2 group	0.00	1.81
3 group	0.14	5.34
4 group	0.22	12.09
5 group (Highest 20% of households)	5.96	28.14
Gini index	0.77	0.55

Table 6.7 shows the affordability of a new unit for different household groups calculated as a percentage of the total households in a group considering this option for improving their living conditions.

Table 6.7. Housing Affordability Under the Sberbank Program, by Household Category

Share of households that can afford a unit	New purchase	Trade up
Households with kids, % (all such households)	15.48	61.38
Individuals, % (all such households)	20.00	34.08
Other households, % (all such households)	17.18	51.03

Tables 6.8 – 6.10 below give estimates for the potential demand for housing and mortgages for each of the three market segments reviewed (low-priced units, modestly-priced units, and median-priced units).

As noted above, the Sberbank Program allows for an improvement in the living conditions of some low-income households. These households demand mainly “low-priced” or “modestly-priced” units.

Table 6.8. Potential Demand for Median-Priced Housing in Moscow Under the Sberbank Program

	New purchase	Trade up
Share of households that can buy a “median-priced” unit, %	6.4	38.33
Share of low-income households that can buy a unit, %	0.00	2.65
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	95.09
Potential demand for “median-priced” housing, bln. \$	5.72	104.50
Potential demand for mortgages, bln. \$	3.91	44.10
Average loan size, thou. \$	70.16	42.51
Average LTV ratio, %	68.26	43.81
Minimum household income, \$	1 578	246

Table 6.9. Potential Demand for Modestly-Priced Housing in Moscow Under the Sberbank Program

	New purchase	Trade up
Share of households that can buy “modestly-priced” house, %	5.92	11.45

Share of low-income households that can buy house, %	0.00	18.99
Share of households that can apply for mortgages, % of hh can buy house	92.00	77.85
Potential demand for “modestly-priced” houses, bln. \$	2.42	15.77
Potential demand for mortgages, bln. \$	1.50	3.07
Average loan size, thou. \$	31.72	12.08
Average LTV ratio, %	67.38	24.84
Minimum household income, \$	801	168

Table 6.10. Potential Demand for Low-Priced Housing in Moscow Under the Sberbank Program

	New purchase	Trade up
Share of households that can buy a “low-priced” unit, %	4.27	2.1
Share of low-income households that can buy a unit, %	0.00	24.14
Share of households that can apply for mortgages, % of households that can buy a unit	100.00	65.52
Potential demand for “low-priced” housing, bln. \$	1.45	2.38
Potential demand for mortgages, bln. \$	0.91	0.48
Average loan size, thou. \$	24.49	12.14
Average LTV ratio, %	62.75	30.45
Minimum household income, \$	739	104

A greater portion of the potential demand for housing goes to the “median-priced” and “modestly-priced” market segments, because the price gap between a “low-priced” and “modestly-priced” unit is small (about \$ 7 thousand) households who are able to improve their living conditions are most likely to be able to finance this gap and buy a more expensive unit.

B. Efficiency of the Subsidy Program

Out of the 20 percent of the households which are able to purchase a new unit do it with the help of the subsidies, and the demand for these subsidies is estimated at \$ 590 million (2 percent of the total Moscow budget for 2003, and 25 percent of the total expenditures on construction¹⁵).

The demand for subsidies in “trade-up” deals is \$ 1.56 billion (67 percent of the total construction budget, 5.3 percent of the total city budget), and these subsidies will serve 7.5 percent of all home buyers.

As repeatedly stressed above, because of the negligible difference between “modestly-priced” and “median-priced” units, the demand strongly favors the median-priced market segment (over 50 percent of the subsidies will be used for acquiring a “median-priced” unit).

The subsidy program promotes better access to housing and improvements in the living conditions: the subsidy gives the opportunity for improving their living conditions to 1.2-2 percent of the households. In case of a trade-up, 65 percent of the subsidy users have low incomes, representing the group of the poorest households. Only fairly well-to-do households can use the subsidy to purchase a new unit.

The subsidy can be used to acquire a higher-priced unit by 0.24 percent and 1.23 percent of households in new purchases and trade-ups, respectively. This means that these households can buy a unit (for example, a low-priced one) that improves their living conditions, but the availability of the subsidy gives them the opportunity to buy a higher-priced unit (for example, in

¹⁵ See the Moscow City Law as of December 18, 2002, *On the Moscow City Budget for 2003*, (No. 63, as amended September 22, 2003).

the “median-priced” group). With respect to a trade-up, 18 percent of such households have low-incomes, and belong to the low-income category.

Table 6.11. The Impact of the Subsidy Program on the Potential Demand for Housing and Housing Affordability

	New purchase	Trade up
Potential demand for subsidies, bln. \$ (PV)	0.59	1.56
Median-priced unit	0.34	1.18
Modestly-priced unit	0.08	0.28
Low-priced unit	0.17	0.11
Share of households that can receive subsidy, % of households that can buy a unit	22.85	7.54
An increase in access to housing ¹⁶ , % points	1.90	1.45
An increase in access for low-income households to housing, % points	0.00	0.94
An increase in access for low-income households to housing, % of total increase	0.00	65.00
An increase in affordability of housing ¹⁷ , % points	0.24	1.23
An increase in affordability for low-income households, % points	0.00	0.22
An increase in affordability for low-income households, % of total increase in affordability	0.00	17.65

Chart 6.2 reflects the uneven distribution of demand among different income groups. As the eligibility was determined on the basis of living conditions, rather than household income, the subsidy was provided to both low-income and higher-income households.

¹⁶ Access to housing is defined as the ability of a household to purchase any of the target units. So, an increase in access to housing means that some households that were unable to buy any target unit before have the opportunity to do it now.

¹⁷ An increase in affordability means that some households that were previously able to buy some target units can buy a more expensive target unit (for example, if previously a household was able to buy a low-priced unit and now it can purchase a modestly-priced unit, it amounts to an increase in the affordability of housing).

Chart 6.2. Potential Demand for Subsidies in a Trade-Up

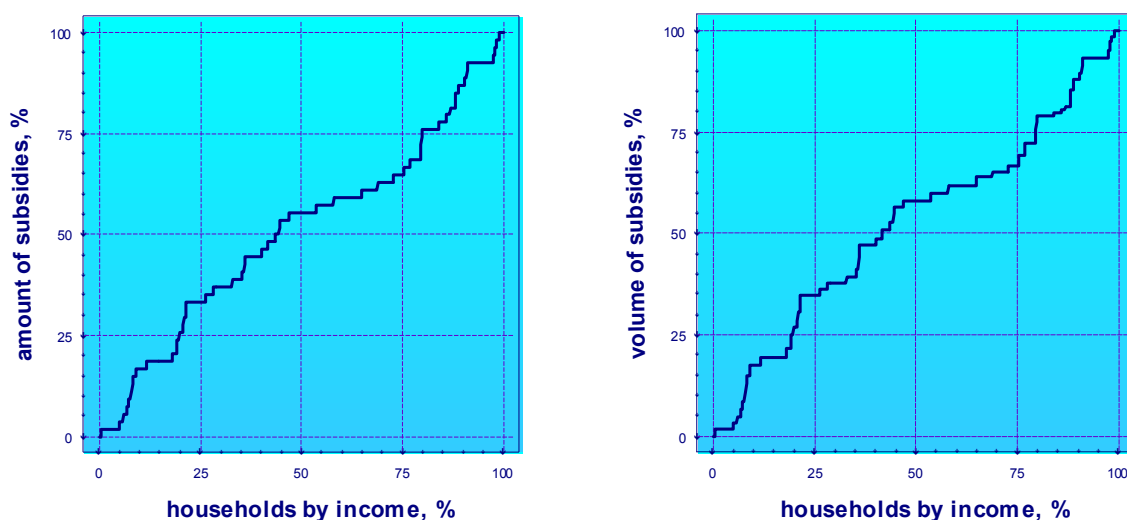


Table 6.12. Potential Demand for Subsidies, by Income Groups

	New purchase	Trade up
Total volume of subsidies, mln. \$	589.51	1 564.91
1 group (Lowest 20% of household)	0.00	419.05
2 group	0.00	319.61
3 group	163.36	227.28
4 group	92.33	269.89
5 group (Highest 20% of households)	333.82	329.08

Table 6.13 gives data on the demand for subsidies among different population groups calculated as a percentage of households in each group.

Table 6.13. Housing Affordability under the Sberbank Program, by Household Category

Share of households that receive subsidy	New purchase	Trade up
Households with kids, % (all such households)	7.10	6.68
Individuals, % (all such households)	0.00	1.79
Other households, % (all such households)	4.20	4.72

7. Comparative Impact of the Mortgage Programs Reviewed on the Affordability of Housing and the Improvement of Living Conditions

As a reference point, we will compare the programs to the situation when no mortgage programs are in place. Despite the rapid development of the mortgage industry (according to the Central Bank of Russia, the volume of loan originations in Moscow in 2002 increased by two times as compared to 2001)¹⁸, the volume of mortgage lending in Russia amounts to a mere 0.5 percent of

¹⁸ *Vestnik* of the Central Bank of Russia, No.56 (708), October 15, 2003.

total lending (0.01 percent of GDP). Therefore, mortgage lending is a virgin land, and any product may be regarded as an innovation targeted to the still uncaptured audiences.

Comparing the maximum market capacity of different mortgage programs (see Table 7.1), one should note that the Raffeißenbank Program concentrates on a fairly narrow group of higher-income households. The AHML and MIA programs are targeted to the broadest population group. The differences in the estimates are caused by the different lending terms: the AHML Program issues loans for the maximum of 20 years, the MIA Program for 10 years, but the relatively shorter loan terms under the latter program are offset by the higher monthly payment to income ratio.

The Delta program is targeted to middle-class borrowers.

Table 7.1. Maximum Mortgage Market Capacity of Different Mortgage Programs

	Delta		Raffeißen		AHML		MIA	
	New	Trade-up	New	Trade-up	New	Trade-up	New	Trade-up
Share of households that can afford a loan, %	31.28	25.72	10.43	15.00	84.12	64.64	63.03	51.30
Households with kids, % (all such households)	29.68	34.45	10.32	20.25	84.52	92.48	72.26	83.51
Individuals, % (all such households)	60.00	15.25	20.00	7.62	60.00	30.49	60.00	20.18
Other households, % (all such households)	31.68	23.01	10.31	13.72	84.35	56.19	57.63	38.79
Maximum loan capacity, bln. \$	13.83	39.69	4.16	23.43	10.49	43.73	8.28	39.28
Maximum capacity of demand for housing, bln. \$	19.37	170.85	10.30	155.47	16.20	174.51	14.13	170.34
Average loan size, thou. \$	50.79	54.20	45.80	54.87	14.33	23.77	15.08	26.90
Gini index of volume of loans distribution	0.67	0.64	0.80	0.71	0.47	0.48	0.48	0.48
of number of loans distribution	0.53	0.50	0.80	0.66	0.01	0.02	0.03	0.03

Our analysis of the estimated demand for housing and mortgage loans supports the classification of the mortgage products discussed above (see Table 7.2). The greatest increase in the number of potential new purchases and trade-ups is observed for the “mass” mortgage programs of AHML and MIA (46 and 43 percent, respectively, in case of trade-up).

The Delta Program is more effective and affordable for selected household categories which are interested in buying and additional apartment (i.e., tenants and splitters). As shown in Table 7.3, about 17 percent of such households will be able to purchase an apartment by participating in the Delta Program, while the AHML Program can serve only 12.5 percent. The Delta Program has the advantage of lower interest rates and higher payment to income ratios, which make borrowers eligible for a bigger loan. Low-income households, also targeted by the AHML Program, are unable to accumulate enough funds (over \$ 35 thousand) to buy a unit, and such households are unlikely to qualify for a Delta mortgage because the minimum loan size is \$ 17 thousand.

“Median-priced” units account for a greater share of housing demand because of the insubstantial differences in the current prices. The gap between a “median-priced” and “low-priced” housing is a mere \$ 20 thousand. As a result, in cases when a mortgage is available (for the average amount of at least \$ 10 thousand), coupled with personal savings in the amount of about \$ 5 thousand, a household is able to opt straight for a “median-priced” or “modestly-priced” unit.

Table 7.2. Potential Demand for Housing and Mortgages Under Various Mortgage Programs

	Delta		Raffeizen		AHML		MIA	
	New	Trade-up	New	Trade-up	New	Trade-up	New	Trade-up
Share of households that can buy house, %	18.95	33.26	10.66	23.48	14.45	46.66	11.61	43.04
Median-priced house	13.03	27.17	5.21	18.19	5.92	33.04	5.21	29.78
Modestly-priced house	3.79	4.86	2.61	4.06	5.45	11.59	4.03	11.30
Low-priced house	2.13	1.23	2.84	1.23	3.08	2.03	2.37	1.96
Households with kids, % (all such households)	17.42	36.33	10.32	22.55	12.26	53.03	10.97	54.28
Individuals, % (all such households)	60.00	28.25	20.00	22.42	20.00	31.84	20.00	28.70
Other households, % (all such households)	19.08	32.74	10.69	24.48	15.65	47.05	11.83	39.82
Share of low-income households that can buy dwelling, %	0.00	0.00	0.00	0.00	0.00	1.52	0.00	1.74
Share of households that can apply for mortgages, % of the households that can buy a unit	98.75	76.03	97.77	63.89	98.36	88.51	97.96	80.47
Potential demand for housing, bln. \$	13.90	89.86	6.15	61.56	7.94	107.22	6.57	99.21
Potential demand for mortgages, bln. \$	11.48	39.39	4.16	23.43	5.39	39.49	4.45	35.85
Share of potential demand for housing in maximum capacity, %	71.75	52.60	59.71	39.60	49.03	61.44	46.53	58.24
Minimum household income, \$	1 271	694	2 055	1 201	1 907	350	1 926	290

Table 7.3. Increases in Potential Demand for Housing and Mortgages Under Various Mortgage Programs

	No credits		Delta		Raffeizen		AHML		MIA	
	New	Trade-up	New	Trade-up	New	Trade-up	New	Trade-up	New	Trade-up
Share of households that can buy a unit, %	1.90	20.36	+17.05	+12.90	+8.76	+3.12	+12.55	+26.30	+9.71	+22.68
Households with kids, % (all such households)	3.23	19.21	+14.19	+17.12	+7.09	+3.34	+9.03	+33.82	+7.74	+35.07
Individuals, % (all such households)	0.00	20.63	+60.00	+7.62	+20.00	+1.79	+20.00	+11.21	+20.00	+8.07
Other households, % (all such households)	1.15	21.09	+17.93	+11.65	+9.54	+3.39	+14.50	+25.96	+10.68	+18.73
Median-priced unit	0.24	11.45	+12.79	+15.72	+4.97	+6.74	+5.68	+21.59	+4.97	+18.33
Modestly-priced unit	0.95	7.61	+2.84	-2.75	+1.66	-3.55	+4.50	+3.98	+3.08	+3.69
Low-priced unit	0.71	1.30	+1.42	-0.07	+2.13	-0.07	+2.37	+0.73	+1.66	+0.66
Potential demand for housing, bln. \$	0.76	34.93	+13.13	+54.94	+5.39	+26.63	+7.18	+72.29	+5.81	+64.28

8. Simulations for the Impact of Different Subsidies on Housing Affordability and Potential Demand for Housing and Mortgages

An important factor in improving housing affordability is the availability of subsidies supporting the mortgage lending system, structured to expand the group of households which are able to improve their living conditions.

One of the pressing problems in the state policies for housing finance is the optimization of state support for home buyers. The tasks that need to be addressed include the improvement of the mechanisms of state support to selected individuals at the expense of the budget funds.

In the past years, a multitude of various programs, at the federal and regional levels have been developed, which in one way or another envisage the improvement of the citizens' living conditions as the prime or subordinate task.

The currently implemented programs of state support to selected population categories in the solution of their housing problems have substantial differences and provide for different implementation mechanisms (gratuitous subsidies, interest rate subsidies, personal income tax benefits, and others).

In this context, a comparison of various subsidy programs and their efficiency, as well as the selection of the most effective options become an important aspect of the state housing policies.

This research analyzes two main approaches to the structuring of housing subsidies – the subsidizing of downpayment for the purchase of housing with the use of a mortgage loan, and the subsidizing of interest rates under mortgages issued by banks on market terms (that is, compensating the bank for the difference between the subsidized interest rate granted to the borrower and the market interest rate).

The analysis was based on the following assumptions.

1. The subsidy is made available for mortgage loans which meet the AHML standards.
2. The rate of discount for future payments under a subsidized loan and for the value of subsidy funds is based on the longest-term fixed-coupon government bonds in rubles. At present these are the federal bonds (OFZ, issue # SU28005RMFS) issued on September 27, 2002 with the maturity date on June 2, 2009 and the interest rate of 10 percent annually.

8.1. Subsidizing Mortgage Interest Rates Regardless of Household Income

Let us examine the efficiency and feasibility of a flat interest rate subsidy currently used in Hungary.

One specific feature of this subsidy is that it is available for any household. The amount of the subsidy is determined by the following factors:

1. A “justified” cost of servicing a mortgage loan, as determined by the state, or, in other words, what the borrower should pay for the loan. In Hungary the “justified” rate established by the legislation equals 5-6 percent annually.
2. Actual cost of attracted resources for the banks’ mortgage lending programs. As a rule, the cost of resources is determined by the interest rates on the mortgage bonds issued by the banks, or the interest rate on government securities.

Thus the amount of subsidy does not depend on a household’s income or any other characteristics.

Banks originating government-subsidized mortgages enjoy the following benefits: the government compensates them for the difference between a market interest rate (the current rate in Hungary is 14 percent annually) and a “justified” interest rate paid by the borrower, that is, the subsidy equals 8 percent. Taking into account that the cost of resources for the banks is 9 percent (the interest rate on mortgage bonds), banks earn a margin of 6 percent, on average.

Upon any increases in the cost of resources, the amount of subsidy also increases accordingly, so that the banks are guaranteed their 6 percent. The Hungarian government has taken certain steps for avoiding excessive budget spending on the subsidies in case of increases in the cost of resources, and limiting access to subsidies for the richest households. At present, the subsidy may not exceed 10 percent, and a subsidized loan may not be issued for more than 15 million forints (\$91.7 thou. dollars)¹⁹.

This program has a major impact on the fiscal system. According to the forecast of the Metropolitan Research Institute, with the current subsidy conditions remaining unchanged, the total volume of subsidies will reach 2.5 - 3.5 percent of GDP by 2010. Over 75 percent of these funds will be required for subsidizing the loans issued in 2002 – 2004. This creates the dangerous possibility for the program to be curtailed in the future. The current housing policy exhibits an openly regressive character, as the bulk of all budget and off-budget subsidies has

¹⁹ Calculated to guarantee the same purchasing power, i.e. the availability to buy the same share of median-priced dwelling.

gone to mortgage borrowers with a higher than the average income, that is, to those who could have received a mortgage loan without the subsidy. The dramatic decrease in population savings may produce macroeconomic problems in the future. Forecasts say that the fiscal system may also face serious consequences. The financial consequences of the program may be worse if no decreases occur in the inflation rate.

Let us now assess the consequences of implementing a similar program in Moscow. Assuming a “justified” interest rate of 6 percent, the required subsidy will equal 9 percent (= 15 percent – 6 percent). No subsidy will be provided for loans exceeding \$ 91.7 thousand. The resulting benefits for the households are so high that even medium income households will prefer a loan that carries a subsidy.

The results presented in Table 8.1.1 indicate that the subsidy has no effect on the affordability of housing for households with limited funds (tenants, splitters). These households would benefit more from a one-time subsidy.

For households with substantial means for the purchase of housing (under the trade-up option), an interest rate subsidy will enable some of them to improve their living conditions by buying a higher-priced unit. Out of the 12 percent of the households which improved their living conditions thanks to the subsidy, about 60 percent represent low-income households, while 6 percent of the households will be able to use the subsidy for acquiring a higher-priced (or better-quality) unit than the one that would have been available without the subsidy.

Table 8.1.1. Increases in the Potential Demand for Housing and Mortgages as a Result of a Subsidy Program

	New purchase	Trade up
Potential demand for subsidies, bln. \$ (PV)	2,12	24,27
Median-priced unit	1,29	22,53
Modestly-priced unit	0,53	1,53
Low-priced unit	0,31	0,21
Share of households that can receive a subsidy, % of households that can buy a unit	100,00	100,00
An increase in access to housing, % points	0,00	11,96
An increase in access for low-income households to housing, % points	0,00	7,17
An increase in access to housing for low-income households, % of total increase	0,00	60,00
An increase in housing affordability, % points	0,00	5,65
An increase in affordability for low-income households, % points	0,00	0,58
An increase in affordability for low-income households, % of total increase in affordability	0,00	10,26

Potential expenditures on interest rate subsidies for tenants and splitters (under the “new purchase” option) are estimated at \$ 2,12 billion in base-year prices. Noteworthy, the subsidies will also be available for a small number of higher-income households which could afford a better-quality unit without the subsidy funds (see Table 8.1.2).

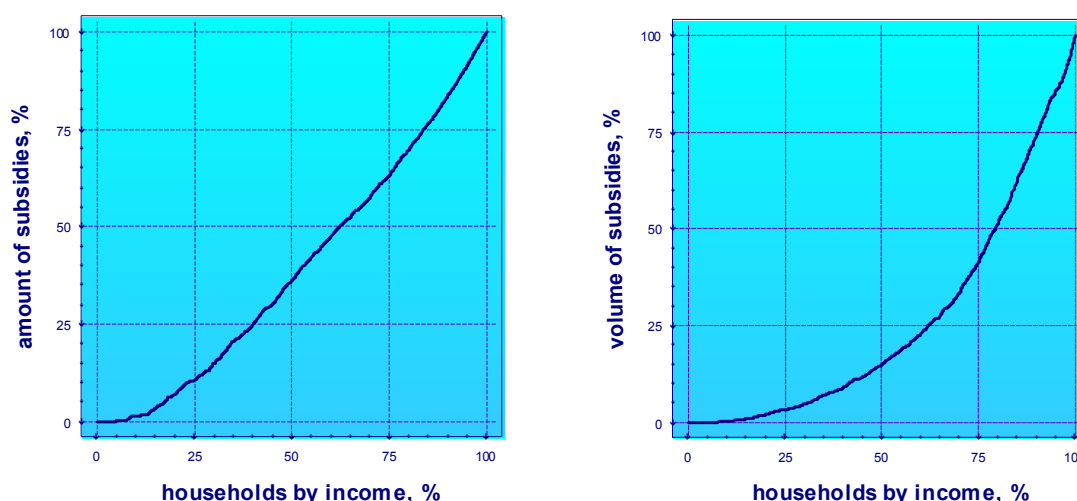
In case of a trade-up, total expenditures for the subsidy program equal \$ 24,3 billion in base-year prices, boosting a potential demand for mortgages by \$ 19.5 billion. The potential demand for housing will grow by \$ 33.4 billion, of which \$ 13.9 billion come in household savings. While the subsidies are available to all households, their main users will be higher-income households

(see Table 8.1.2 and Chart 8.1.1). State expenditures will amount, on the average, to 40 percent of the total volume of issued loans.

Table 8.1.2. Potential Demand for Subsidies, by Income Groups

	New purchase	Trade up
Total volume of subsidies, mln. \$	2 123,93	24 273,14
1 group (Lowest 20% of households)	0,00	485,71
2 group	0,00	1 656,49
3 group	0,00	3 371,79
4 group	0,00	6 942,16
5 group (Highest 20% of households)	2 123,93	11 816,99

Chart 8.1.1. Potential Demand for Subsidies in a Trade-Up



Therefore, the subsidy does not have any substantial effect on the affordability of housing for households which do not intend to sell the existing units. The main subsidy users will be higher-income households. On the average, in order to increase lending volumes by \$ 1 million, the state will have to spend \$ 1.23 million in interest rate subsidies.

8.2. Subsidizing Interest Rate Subsidies with Regard to Household Income

Let us consider a model example of a subsidy tied to adjusted per capita income²⁰. Assuming a maximum interest rate subsidy of 7 percentage points, the subsidy for a particular household will be calculated as follows:

Table 8.2.1. Interest Rate Subsidy Size

Adjusted per capita monthly income, \$	Share of households, %	Subsidy, % points
under 95	10.0	9
95 – 160	21.4	7

²⁰ Adjusted per capita income is discussed in details in Appendix 4

160 – 220	13.9	6
220 – 285	8.6	5
285 – 350	5.1	5
350 – 415	3.4	4
415 – 480	3.8	3
480 – 540	2.6	2
540 – 575	1.1	1
575 and higher	30	0

The subsidy is not granted to the most rich 30% of households; the poorest 10% of households receive the maximum subsidy – 9 percentage points, and another 20% of households receive a subsidy in the amount of 8 percentage points.

The impact of this subsidizing scenario on the affordability of housing is exhibited in Table 8.2.2. The subsidy will help only households which intend to sell the existing unit (the “trade-up” option). Out of the 10.3 percent of the households which improved their living conditions thanks to the subsidy, about 63 percent represent low-income households, while 3.6 percent of the households will be able to use the subsidy for acquiring a higher-priced (or better-quality) unit than the one that would have been available without the subsidy.

For households buying a new unit (without selling the existing one), that is, for tenants and splitters, the availability of a subsidy has little effect on their ability to improve their living conditions. Out of the 14 percent of households which are able to improve their living conditions, only 1.5 percent will be eligible for a subsidy.

Table 8.2.2. Increases in Potential Demand for Housing and Mortgages as a Result of the Subsidy Program

	New purchase	Trade up
Potential demand for subsidies, bln. \$ (PV)	“a”	3.89
Median-priced unit	“a”	2.63
Modestly-priced unit	“a”	1.11
Low-priced unit	“a”	0.15
Share of households that can receive subsidy, % of households that can buy a unit	1.66	56.62
An increase in access to housing, % points	“a”	10.29
An increase in access to housing for low-income households, % points	“a”	6.45
An increase in access to housing for low-income households, % of total increase	“a”	62.68
An increase in affordability of housing, % points	“a”	3.62
An increase in affordability for low-income households, % points	“a”	0.58
An increase in affordability for low-income households, % of total increase in affordability	“a”	16.00

“a” – less than 0.01

Potential expenditures on interest rate subsidies for tenants and splitters (under the “new purchase” option) are estimated at \$ 2 million in base-year prices. Noteworthy, the subsidies will be available for a small number of higher-income households (See Table 8.2.3).

In case of a trade-up, total expenditures for the subsidy program equal \$ 3.9 billion in base-year prices, boosting a potential demand for mortgages by \$ 6.2 billion. The potential demand for housing will grow by \$ 19.18 billion, of which \$ 9 billion come in household savings. The

subsidies will be available to over 55 percent of the households wishing to improve their living conditions with the main users being the moderate-income households (see Table 8.2.3 and Chart 8.2.1).

On the average, in order to increase lending volumes by \$ 1 million, the state will have to spend \$ 0.63 million in interest rate subsidies.

Table 8.2.3. Potential Demand for Subsidies, by Income Groups

	New purchase	Trade up
Total volume of subsidies, mln. \$	2.36	3 892.91
1 group (Lowest 20% of households)	0.00	392.25
2 group	0.00	1 201.93
3 group	0.00	1 756.47
4 group	2.36	542.26
5 group (Highest 20% of households)	0.00	0.00

Chart 8.2.1. Potential Demand for Subsidies in a Trade-Up

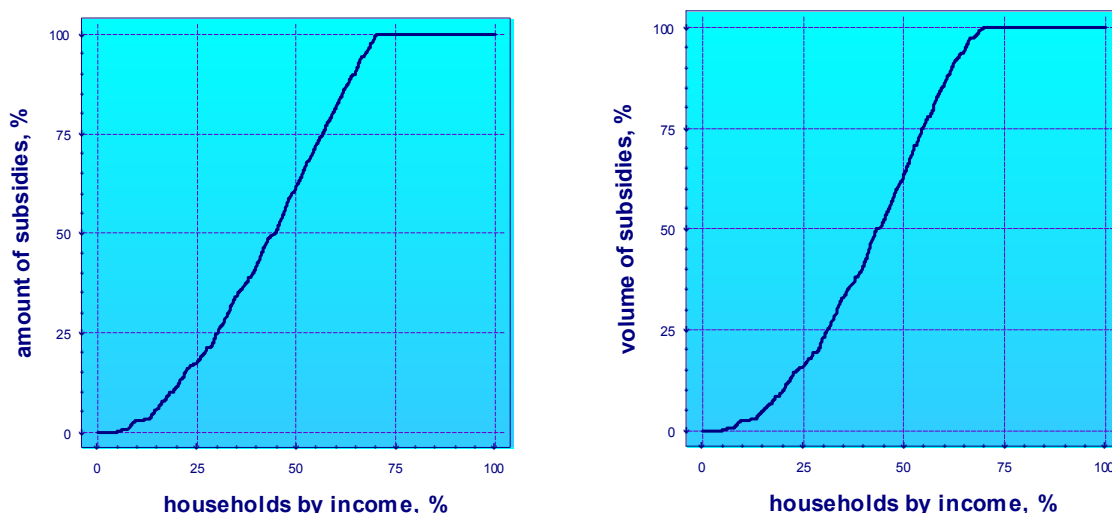


Table 8.2.4 shows the structure of the households which improve their living conditions with the use of the subsidy. Practically no subsidies are granted for the purchase of a new unit because in this case the subsidy size is insufficient for achieving an improvement. In case of a trade-up, about 50 percent of households with children will be able to improve their living conditions by getting the subsidy.

Table 8.2.4. Housing Affordability, by Household Category

Share of households that receives subsidy	New purchase	Trade up
Households with kids, % (all such households)	0.65	50.94
Individuals, % (all such households)	0.00	2.24
Other households, % (all such households)	0.38	35.99

Therefore, the subsidy has little effect on the affordability of housing, particularly for households which do not intend to sell the existing unit.

For the purpose of comparison, let us consider a program with lower subsidies. The maximum subsidy is 7 percentage points; the subsidy size for a particular household is tied to the adjusted per capita income and is calculated in the following manner:

Table 8.2.5. The Interest Rate Subsidy Size

Adjusted per capita monthly income, \$	Share of households, %	Subsidy size, % points
under 115	16.2	7
115 – 195	23.8	6
195 – 275	12.0	5
275 – 360	7.8	4
360 – 440	4.3	3
440 – 520	3.8	2
520 – 575	2.1	1
575 and higher	30.0	0

As before, the most affluent households (30%) do not receive the subsidy; 16% - the poorest households – receive maximum subsidy of 7 percentage points, while about 25 % of households receive 6 percentage points.

The impact of this subsidy scenario on the affordability of housing is exhibited in Table 8.2.6. As compared to the previous scenario, the subsidy will help only 7.8 percent of the households which intend to sell the existing unit (the “trade-up” option). Out of these, the same 50 percent represent low-income households. Compared to the previous scenario (see Table 8.2.2), there is a slightly lower share of households which will be able to use the subsidy for acquiring a higher-priced (or better-quality) unit than the one that would have been available without the subsidy.

For households buying a new unit (without selling the existing one), that is, for tenants and splitters, the availability of a subsidy has next to no effect on their ability to improve their living conditions. Out of the 15 percent of households which are able to improve their living conditions, only 10 percent will be eligible for a subsidy.

Table 8.2.6. Increases in Potential Demand for Housing and Mortgages as a Result of the Subsidy Program

	New purchase	Trade up
Potential demand for subsidies, bln. \$ (PV)	"a"	2.65
Median-priced unit	"a"	1.73
Modestly-priced unit	"a"	0.82
Low-priced unit	"a"	0.10
Share of households that can receive subsidy, % of hh can buy house	1.66	54.58
An increase in access to housing, % points	"a"	7.75
An increase in access to housing for low-income households, % points	"a"	4.06
An increase in to housing access for low-income households, % of total increase	"a"	52.34
An increase in affordability of housing, % points	"a"	2.68
An increase in affordability for low-income households, % points	"a"	0.51

An increase in affordability for low-income households, % of total increase in affordability	"a"	18.92
"a" – less than 0,01		

Under this scenario, potential expenditures on interest rate subsidies for renters and splitters (under the "new purchase" option) are estimated at \$ 2.4 million in base-year prices. Noteworthy, the subsidies will be available for a small number of higher-income households (see Table 8.2.7).

In case of a trade-up, total expenditures for the subsidy program equal \$ 2.65 billion in base-year prices, boosting a potential demand for mortgages by \$ 4.5 billion. The potential demand for housing will grow by \$ 14.4 billion, of which \$ 7.25 billion come in household savings. Same as in the previous scenario, the subsidies will be available to 55 percent of the households wishing to improve their living conditions with the main users being the moderate-income households (see Table 8.2.7).

On the average, in order to increase lending volumes by \$ 1 million, the state will have to spend \$ 0.59 million in interest rate subsidies.

Table 8.2.7. Potential Demand for Subsidies, by Income Groups

	New purchase	Trade up
Total volume of subsidies, mln. \$	2.36	2 654.77
1 group (Lowest 20% of households)	0.00	198.21
2 group	0.00	788.50
3 group	0.00	1 265.44
4 group	2.36	402.62
5 group (Highest 20% of households)	0.00	0.00

Therefore, the second scenario allows for the improvement of living conditions for a lower number of households (-2.54 percent of all households), but costs less (- \$ 1.24 billion).

Overall, neither scenario for an interest rate subsidy program may be regarded as an effective instrument for improving access to housing for low-income households, because a greater portion of the subsidies will go to medium and moderate-income households.

A comparison of the efficiency of interest rate subsidies and downpayment subsidies follows.

8.3. Downpayment Subsidy

Let us consider a downpayment subsidy equivalent to the cost of the interest rate subsidy discussed above. We take the interest rate subsidy described in Table 8.2.1, under which lower income households receive large subsidies per dollar borrowed. Let us consider the down payment subsidy provided to a household in amount equal to the present value of the interest rate subsidy. For estimating the interest rate subsidy let us use the model shown in Fig. 8.2.1. From this is evident that the both models suggest spending a similar amount on subsidizing each household, but for a specific household one type of subsidy may appear more preferable than the other due to the housing affordability factor.

Let us analyze the option of payment of a non-repayable subsidy equal to the present value of the interest rate subsidy to 70 percent of eligible households.

Households willing to acquire a unit without selling the old one (the "new purchase" option) would benefit most (see Table 8.3.1): 3 percent of the households would be able to improve their living conditions. The subsidy would go to almost 20 percent of all households who are able to

acquire a unit. The cost of the subsidy program would also increase from the \$2.3 million in case of interest rate subsidies to \$120 million for one-time downpayment subsidies, indicative of an increase in housing affordability. No interest rate subsidy is provided to households who are unable to acquire a unit.

A greater portion of the subsidies would be provided for the purchase of “low-priced” units (worth \$35-42 thousand).

In case of a “trade-up” the housing affordability would also grow, though to a lesser extent: the share of households able to improve their living conditions would grow by 0.5 percent points. The total cost of such subsidy program amounts to \$ 3.94 billion, or \$50 million more than for an interest rate subsidy program.

Table 8.3.1. Increases in the Potential Demand for Housing and Mortgages Caused by a Subsidy Program

	New purchase	Trade up
Potential demand for subsidies, bln. \$ (PV)	0.12	3.94
Median-priced unit	0.00	2.67
Modestly-priced unit	0.01	1.12
Low-priced unit	0.11	0.15
Share of households that can receive a subsidy, % of households that can buy a unit	17.80	56.94
An increase in access to housing, % points	2.84	10.72
An increase in access to housing for low-income households, % points	”a”	6.74
An increase in access to housing for low-income households, % of total increase	”a”	62.84
An increase in affordability of housing, % points	”a”	3.70
An increase in affordability for low-income households, % points	”a”	0.58
An increase in affordability for low-income households, % of total increase in affordability	”a”	15.69

”a” – less than 0,01

For trade-ups, the demand for subsidy-supported mortgage loans will increase by \$ 2.2 billion, or \$ 4 billion less than in case of an interest rate subsidy, i.e. provision of downpayment subsidies results in the reduction in the volume of loans granted. This is explained by the fact that in case of downpayment subsidy, the borrower has to pay a higher interest rate on the loan than in the case of interest rate subsidy, and the loan amount which the borrower could have obtained based on his income and savings is thus reduced. When housing is purchased with simultaneous sale of the existing housing unit, income is the main factor limiting the loan amount. Therefore, with a higher interest rate, the borrower can be eligible for a smaller loan, even when downpayment subsidy is granted. Thus, downpayment subsidy, which implies a higher interest rate than the interest-rate subsidy, compensates the borrower for the reduction of the loan amount. On the average, in order to increase the volume of loans granted by \$ 1 million, the government should spend \$1.8 million for subsidies

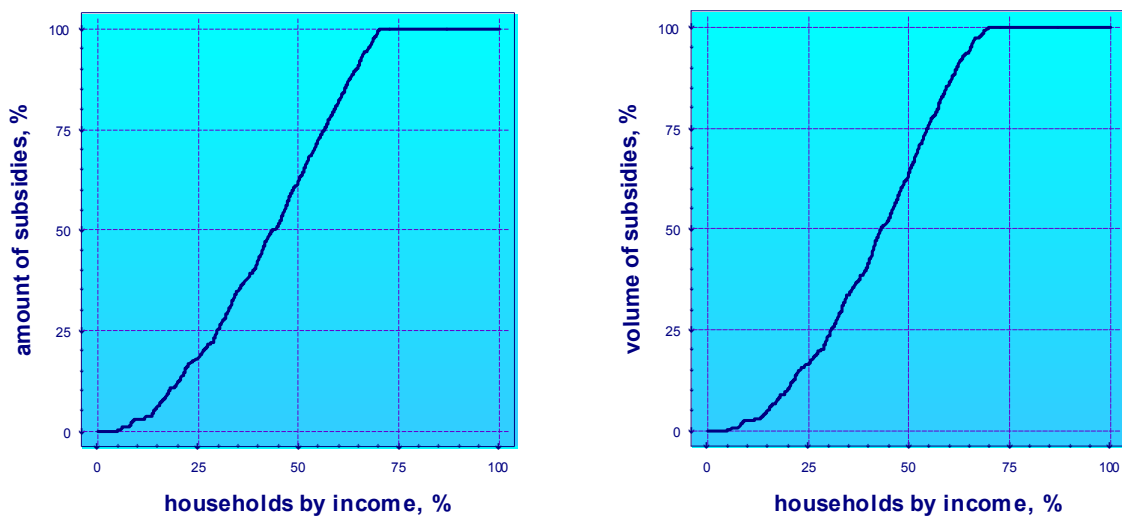
For tenants and splitters, the “ousting effect” does not work because for these households the unavailability of personal savings acts as a limiting factor. As a result, a one-time subsidy gives these households the opportunity to improve their living conditions. The potential demand for mortgages will increase by \$ 660 million.

Table 8.3.2 below shows a potential demand for subsidies. Same as for an interest rate subsidy, a greater portion of the loans will go to moderate-income households.

Table 8.3.2. Potential Demand for Housing, by Income Groups

	New purchase	Trade up
Total volume of subsidies, mln. \$	120.03	3 937.13
1 group (Lowest 20% of household)	0.00	412.13
2 group	0.00	1 226.27
3 group	0.00	1 756.47
4 group	120.03	542.26
5 group (highest 20% of households)	0.00	0.00

Chart 8.3.1. Potential Demand for Subsidies Under a Trade-Up Option



Thus a one-time subsidy seems to be a slightly more effective option from the viewpoint of improving housing affordability as compared to an interest rate subsidy. A one-time subsidy should be more effective for households with limited savings (such as tenants). The proposed ways of housing purchase subsidizing do not enable moderate-income households to improve their living conditions, as the subsidies granted are not sufficient for purchasing the housing. Generally, households with medium income participate in these programs.

Of special note are the risks associated with interest rate subsidies. One should also stress the inefficiency of the approach according to which the budgets are burdened with the task of subsidizing mortgage rates. The budgets are thus forced to assume the uncharacteristic function of compensating the difference between a market interest rate (which the banks establish according to their own criteria), and a discounted interest rate. As home mortgages are typically long-term, the substantial market changes in unstable economies may result in higher interest rates, and, accordingly, a higher budget burden. Most importantly, the funds allocated for the housing program may turn out to be insufficient (as is actually observed in practice). The funds that may be required for the subsidy programs are difficult to estimate in view of their strong dependence on the trends on the credit and financial markets. As a result, there is a strong likelihood of the budget subsidies eating up a substantial portion of the budget, which will create a budget obligations crisis.

The downpayment subsidies for mortgage borrowers or home buyers, if carefully structured to ensure targeted use of the funds and transparent cash flows, appear to be a more stable and

forecastable way of assisting households in the improvement of their living conditions from the viewpoint of the budgetary process. Apart from the unforecastable values, the targeted use of the interest rate subsidy funds is hard to control. If banks are allowed to issue subsidized loans, it will be difficult to prevent lending to well-to-do-borrowers, whose paying capacity makes is sufficient for a market loan, as opposed to low-income households.

The Impact of Housing Prices on Housing Affordability and Potential Demand for Mortgages

When assessing the affordability of various mortgage products and the potential demand for housing, changes in the market prices for housing are an important factor. As confirmed by the experience of most countries working on their mortgage lending programs, increases in the volume of retail loans and the corresponding increases in the volume of housing supply drive up the prices for housing. This, in turn, reduces housing affordability. This trend is typically observed for a short term, as with time the higher prices on the housing market boost investment in housing construction and the supply of new housing, which result in a gradual decrease of housing prices.

To adapt estimates of housing affordability and potential demand for mortgages produced with the use of our model to potential changes on the housing market, we provide additional calculations which assume that the prices will grow. While the resultant model is not a dynamic model, it allows for simulating various market development scenarios.

Let us analyze the consequences of a 20-percent price increase on the assumption that the price curve did not change, i.e. the prices of both the median and low-priced housing increased by 20 percent.

The results, summarized in Table 9.1, speak of a low sensitivity of housing affordability to market prices. A 20-percent increase resulted in the decrease of the share of households who could afford a new unit by 1-3.5 percentage points, with a 1.5-2.5 percentage point decrease in case of a trade-up.

The strongest impact was observed for median-priced units. After the price increase, households who had been able to acquire a median-priced unit could buy only a modestly or low-priced one. As one result, the demand for such housing grew.

As regards the mortgage lending programs in Moscow, potential demand for mortgages targeted on high-income households (Delta and Raffeizenbank) decreased less than for the more popular programs of AHML and MIA. Higher prices make housing unaffordable primarily for households with modest incomes who constitute a substantial percentage of AHML and MIA clients.

Almost no changes occurred in the affordability of housing for young households participating in the NMC program. The reason may lie in the fairly high eligibility requirements, as a result of which potential borrowers could still acquire a unit, albeit a cheaper one (that is, the demand shifted toward modestly-priced housing). Housing affordability also decreased among the households who prior to the price increase were able to acquire a unit without a loan (0.7-2.1 percent of such households become unable to improve their living conditions).

Table 9.1. The Impact of Housing Prices on Housing Affordability and Potential Demand for Mortgages

	No credit		Delta		Raffeizen		AHML		MIA		NMC	
	New	Trade-up	New	Trade-up	New	Trade-up	Trade-up	Trade-up	New	Trade-up	New	Trade-up
Share of households that can buy a unit, %	-0.72	-2.10	-3.31	-1.74	-3.08	-1.59	-4.27	-2.96	-3.55	-2.69	-0.70	-2.10
Median-priced unit	-0.24	-6.09	-2.84	-4.56	-1.42	-2.32	-1.42	-7.82	-1.18	-7.32	-1.66	-5.36

Modestly-priced unit	-0.24	+0.87	+0.24	+1.66	-0.95	-0.65	-3.32	+0.37	-2.61	0.00	+1.19	+0.43
Low-priced unit	-0.24	+3.12	-0.71	+1.16	-0.71	+1.38	+0.47	+4.49	+0.24	+4.63	-0.23	+2.83
Households with kids, % (all such households)	-1.29	-1.05	-3.87	-0.84	-1.93	-0.21	-2.58	-2.72	-1.94	-2.51	-0.65	-1.05
Individuals, % (all such households)	0.00	-4.93	0.00	-4.93	-20.00	-4.48	-20.00	-4.49	-20.00	-4.48	0.00	-4.93
Other households, % (all such households)	-0.39	-1.92	-3.05	-1.32	-3.44	-1.62	-4.96	-2.65	-4.20	-2.21	-0.77	-1.92
Potential demand for housing, bln. \$	-0.24	-2.44	-1.18	-2.00	-1.08	-1.83	-1.48	-3.44	-1.24	-3.08	-0.25	-2.44
Potential demand for mortgages, bln. \$	0.00	0.00	-0.98	-0.34	-0.74	-0.11	-1.02	-0.52	-0.85	-0.40	-0.13	0.00

Table 9.1 shows that higher housing prices had less effect on the affordability of housing under the Delta and Raffeizenbank programs as compared to the no-credit option. This means that availability of a mortgage loan acts as a cushion against the negative impacts of price increases. A deeper decrease in the affordability of housing under the AHML and MIA programs is explained by the fact that these programs provided low-priced housing for households with modest incomes. When the prices for housing grew higher, these households found themselves unable to acquire a unit, because a cheaper unit could not be regarded as an improvement while there was money for a higher-priced one.