THE EFFICIENCY ANALYSIS OF HOME LENDING MARKET IN HUNGARY BETWEEN 1992 AND 2000

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1. Aim of paper and preliminaries

This paper examines the system and operational characteristics of Hungarian home lending market between January of 1992 and December of 2000. The purpose is to collect the factors which determine the outstanding home loans and to get the answer, why the role of home lending decreased till the recent days (March of 2000)

I've chosen this theme for two reasons. In 1993 and in 1995 I spent two-two month practice at an English building society at the Yorkshire Building Society, where I got acquainted a well operating home lending system.

The second reason was, that in 1995 I considered to raise home loan, but in that time the interest rates jumped high and I found the home loans extremely expensive. I recognised the big differences between the English and Hungarian home lending system and began to search the reasons. While I wrote my university doctor dissertation about another retail banking topic (I worked on the special credit construction available for small enterprises), I have chosen another similar field - the home lending.

The efficiency analysis of home lending has been made to the period between January of 1992 and December of 2000. The statements of paper regard to this period. The tendencies for the future are only mentioned in this paper. Since the home lending market is one of the quickest changing fields of Hungarian economic life, some of the statements are true only in a particular period.

The explanation of the beginning in 1992 is the fact, that in the previous period the interests of home loans were heavily subsidized by the state. In 1991 the home loans of interest rate 3% were over and the loans got a variable rate following the financial market. 1992 is the first full year, which was free of big political changes and the market was dominated by loans with variable rate. The analysis is closed with data from December of 2000, which was the last full year before finishing this paper.
In point of analysis the examined period can be split in two not equal parts. Between January of 1992 and March of 2000 the amount of home loans adjusted by inflation decreased, from March of 2000 it has been increasing. I will show in my paper, that the change in tendency of real stock has happened together with other phenomena (decrease in real interest rate, more homogeneous market rates, increase in number of loan suppliers), which improved the efficiency of granting loans.

In my paper the home lending market were examined from the point of banks.

To apply the relative definition of efficiency\(^1\) on the theme of this paper, I think the home lending efficient, if the law of single price prevails, thus the cost of each loan product only differs due to the different level of undertaken risk and their flexibility.

In my paper the risk of home lending has got enhanced importance, as the factor influencing the price of loan product.

I think to understand the reason of home loan market efficiency could be useful, because a more effective system offers several advantages. According to my hypotheses, which were stated from Mayo-Angel’s\(^2\) and Bertrand’s\(^3\) paper, and tried to be proved by international comparison, if the role of lending is growing:

1. Increasing mobility of workforce
2. A new market opens for financial institutions, which offers nice profit for the firs comers.
3. The price of real estate increases and thereafter the national wealth.
4. The circumstances of homes improve.
5. The home lending would promote the people to be the owner of their flat. The people prefer to live their own flat, than to rent one.
6. The home loan would make easier for young’s to access new flat and encourage an increase in birth rate.
7. The efficient home lending would stimulates the economy, thus the efficiency would increase the revenue of state.
8. If the stock of home loans increase, the efficiency of monetary policy would also increase. The change in interest rate would directly influence

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\(^1\) About the concepts of efficiency see Tóth Á. [1999] Kisérlet a hatékonyság empirikus elemzésére MNB Füzetek 1999/2


the households' demand on goods, thus the gross national disposal income could be better regulated by interest rate

2. The applied method and its reasons

In my paper I'm going to examine the efficiency of home lending by the following point of view:
1. The analysis of efficiency has been made to the loan products and the whole home lending market as well. In case of loan products the methodology was worked out by me, in case of market I have applied the method published by Ábel-Polivka. In case of loan products I compared the cost and flexibility of loans. I examined the validity of single price. As the total loan fee indicator is not obligatory to calculate, I proposed how to calculate it in case of home loans. From the paper of Ábel-Polivka I have taken over the aspects of analysis. Among other I have examined, how to form the interest spread, how to prevail the law of single price, how to be the product multicoloured, etc.

2. After the diagnostic test I want to determine the macroeconomic factors which influence the amount of home loans based on a time series analysis worked out by Margit Zierman. Based on my hypothesis I create independent factors from the relevant macroeconomic variables, then I try to identify this factors. Then I fit a regression line with the help of independent factors to the actual figure of home loans and then I map the relationship between the home loans and the original variables.

3. Finally I present the potential economic and social consequences of an efficient home lending system using the statistical data of Hungary, the United States and the countries of European Union. I have striven to collect data of more and more countries to increase the reliability of my consequences.

In my research I used the data and statements of Maclennan, Bertrand, Mayo and OECD study. The method of analysis is the correlation and regression calculation.

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6 Ziermann M. [1995] Időssorok faktoranalízise Szigma 1995/3-4

4. After analyzing the countries’ home lending I turned to analyze the institutional background. One aspect was how closed the home lending is (if the given institution deals with other financial services besides home deposits and loans, or not), the second aspects focused on the liability side, where the sources of loans come from, from deposits or from securities. The institutions were compared on their way of risk management. In analysis publications of Lea, Éliás, Gellért were used.

5. A separate chapter was devoted to the regulational risk. In this I overviewed the Hungarian home policy in the given period, with special regard to the current regulation. I propose how to change the home policy.

In analysis I used publication of Dániel, Hegedüs, Tosics and KSH.

Finally in appendix I compared the English and Hungarian risk management inside of bank. On the basis of comparison I gave recommendation to improve the Hungarian banks’ practice. In my opinion the weak efficiency of home lending in the 90’s were caused by the high level of risk, which hindered the entry of banks into this market and blocked the competition. I will examine four sources of risk and their management. Political risk, interest rate risk, liquidity risk and credit risk. I show the reasons, which affect the efficiency of home lending.

3. The dissertation’s main scientific findings, results

I have stated that the home lending market in Hungary had got weak efficiency, but in 2000 the efficiency began to improve.

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12 Dániel Zs [1997] Lakástámogatás és társadalmi újraelosztás
15 Lakasviszonyok 99 I-II KSH Társadalomstatisztikai Füzetek 27-28
The efficiency analysis of the Hungarian home loan market stood in the focus of my paper. I stated that the home loan market is not efficient, but the efficiency began to improve in 2000. To examine the efficiency at level of bank product I have worked out a method, which presents the bank products in a co-ordination system. The X axis shows the cost of given product (in case of loan total loan fee indicator), the vertical axis represents the flexibility of product, which is determined by a score weighted by the importance of viewpoint. The market is efficient, if the products are on the way of a line with positive slope. The measurement of efficiency is the $R^2$ of regression line. This figure was 0.1 in case of loan product in December of 2000, thus the difference in cost does not explain the flexibility of loans – the single price law didn’t prevail.

Chart 1.
The flexibility-cost chart of Hungarian market rate home loans

[Diagram showing the flexibility-cost chart]

At the level of system the phenomena of weak efficiency of home loan market are the following:

1. The interest rate of market home loans compared with corporate loans was high and the rates were rigid, followed the changes of market yields with significant delay.
2. The volatility of loan rates were low, the rates lived separate life and remained the same in long run.

3. The gap among the interest rate of banks is high – the variance of interest rate of banks increases till February, 2000, than began to close.

4. The difference among other charges and fees were significant in 1999, then the charges are made more various.

5. The interest rates do not differentiate by the solvency of client. In 2000 the situation began to change.

6. Till 2000 the OTP has monopoly in the home lending.

7. The stock of home loans differently formed from the households’ investments and other loans. Especially interesting is the contrast with the personal loan. In 2000 a change happened, the stock of home loans began to raise. Against the fact that the stock of long run savings dynamically raised in recent years, the sources were not absorbed by home loans, but long term corporate loans and securities.

8. There are meaningful differences among the conditions of banks’ home loans. The constructions are announced with differing maturity, own sources and income to loan ratio. The unification of loan products has not happened. The quality variance of products is big.

9. The increase in households real income were not promptly followed by increase in stock of loans. The change happened in 2000.

10. The home loans were exclusively issued with fix rate till 1999, so the interest rate risk didn’t bear by banks. The turn happened only in 2000, when the constructions with 5 year interest period appeared.

The factors influencing the magnitude of home loans are determined by the followings:

1. The first determinant of home loans is at first the real interest rate, not the nominal one.

2. The household’s wages is the second variable. The real income has got more explanation value than the nominal one.

3. The level of inflation is the third one. The high inflation suppresses the stock of loan, the decrease in inflation results an increase in stock of loan. This is shown by the unsuccessfulness of nominal factor model and the relative success of real factor one.

4. The home prices are influences the incomes. There is no detectable connection with the loan stock.

5. I cannot prove if the home lending influences the economic cycle. There is no detectable linkage between stock of loan and the industrial output and between stock of loan and number of home building.
I have made a factor analysis to explore the effect of a wider range of macroeconomic variables to the size of home loans. I determined the following factors:

1. Factor - **Stock and income figures** - The first factor contains the stock of loans and investments besides the long term credit rates (with which correlates negatively) and the unemployment. The factor is very compact, since it has got a correlation over 90% with the majority of variables. In my opinion the values belonged to first factors show high value, because the inflation affects them. It is not surprise, that it has got the strongest linkage with the inflation (disregard to stock of foreign currency deposits).

2. Factor - **Market rates** - The second factor correlates strongly with various market rates. The only exception is the long term credit rates, which is put to the first factor thanks to the very strong negative correlation. The leading indicator of second factor is the short term deposit rate, whose correlation is the strongest with the second factor.

3. Factor - **Flat building and home loans** - The third factors contains the variables, which do not fit to the former two factor. The number of flat building belongs to here, which is the leading indicator of this factor. The factors shows weak correlation with the home loans, but this connection seems to be rather random.
From the data you can see, what variables determine the factors. The first factor depends mainly on inflation, the second one depends on short term deposit rate and the third one depends on the flat building.

After calculating the regression, the equation of regression line looks like the following:

\[ \text{LAKAS}_H = 155.6 - 21.04 \times \text{fakt1} - 10.5 \times \text{fakt2} \]

The model must not be used for forecasting due to the poor result of Durbin-Watson test.

From the nominal model, the following finding can be deduced.

1. The increase in households' loan was much lower than the increase in financial wealth, which proves the low efficiency of home lending.
2. The increase in home loans followed the increase in real wages with significant delay, which supports the assumptions that the home loans were expensive for private persons in 1998-99.
3. The increase of inflation decreased the size of home loans, because it increased the nominal rates, which deterred the buyers to raise loans.
4. There is a negative linkage between the yields and size of loans.
5. I cannot prove that the home loans affect the economic climate. There are no significant connection between home loans and industrial output, unemployment and home buildings.

In case of real model clarified from inflation I got the following factors and regression line:

1. Factor - Households’ savings (explained 43.5% from total variance)
2. Factor - Incomes (explained 30%)
3. Factor - Yields (explained 14%)
4. Factor - It hasn’t got interpretable sense (explained 7%)

\[ \text{Lakhit} = 69.546 - 25.959 \times f1 + 22.496 \times f2 + -8.04 \times f3 + 9.974 \times f4 \]

The result of Durbin-Watson test (0.752) didn’t show random residuals.

I compare some characteristics of European and Hungarian home financing. In case of cross country comparison the correlation and regression calculation have not got the traps, which exist in the time series. In my examination I see some characteristics of home lending in some countries. The countries of European Union, Switzerland, the United States and Hungary were involved into analysis. Due to the comparison I worked not with the absolute amount of home loans but with the loan stock to GDP. In case of Hungary I worked the data from 1999, in case of the other countries data from mainly 1997 were used.
I stated that the Hungarian banks burden the risk of deal to their customer. Comparing with the international average they lend with short maturity, with low loan to value and with variable interest rate. The real interest rate of loan is extremely high in international standards. In 2000 some progress can be detected. The home lending encourage the mobility of population. The high transaction costs (taxes, and charges) hinder the home lending. The larger the home lending to GDP is, the longer the maturity of loan and the higher the loan to value ratio. There is no detectable linkage between the ratio of fixed loan and the mortgage loan to GDP. In my analysis the home lending does not promote the increase in owned flat. does not increase the threat of property price bubble and does not stimulate the increase in home building and does not stipulate the economy. The home lending is developed in countries, where the sources of lending are acquired by issuing securities or special institutions serve the clients.
I have separated 4 groups of institutions:
1. Market dominated by commercial banks and lending co-operatives
2. Market dominated by mortgage banks
3. Market dominated by special institutions (building societies, building cooperatives)

I stated, that the home lending is most developed, where the liabilities of lending are raised through issuing securities or special financial institutions grant the loans.

One type of special credit institution of home lending is the contractual institution, which deals exclusively with home lending. Its closed form as building society was introduced in Hungary. I see the advantages and disadvantages of building societies compared with commercial banks in the followings:

**Advantages:**
1. The risk management of home lending is the best compared with other structures.
2. It means calculable burden for the client in the saving and in the repayment period as well.
3. The state subsidy can be required for renovations and maintenance.
4. It excites the own sources and supports afterwards.
5. The state subsidy is more calculable.
The weaknesses of construction:
1. Long presaving period.
2. Limited contractual amount and it is uncertain at the grant of loan, how much it is worth.
3. It is rigid, the interest of individuals does not be considered.

The advantages and disadvantages of mortgage banks and the securization are the followings:

Advantages, opportunities:
1. It manages the interest and liquidity risk.
2. It stimulates the development of capital markets.
3. It makes possible wide product range and operates a system which meets the needs of individuals.
4. Promptly available loans, no presaving period.

Disadvantages, threats:
1. The credit risk is not managed and the credit risk affects directly the capital market.
2. It might encourage the moral hazard, if the loans has state guarantee.
3. The management of prepayments is problematical in the system. The prepayments could make the buying of mortgage bonds risky and uncertain.
4. The pricing of mortgage bonds requires good skill.

I see the tendencies of Hungarian economic policy in 90’s in the followings:
1. The circle of subsidized were widened.
2. The principle to support everybody began to dominate instead of the policy to supports the poor.
3. The policy is in growing part building on the applicants’ own sources.
4. The home building remained the main target of subsidies, but the renovation and maintenance were also getting to be supported.
5. The size of state subsidy in percentage of GDP decreased in the examined period.
6. Inside of direct subsidies the subsidy through the bank sector began to increase after an interim fall in the middle of 90’s.

Since the second half of 90’s the factors responsible for inefficiency began to weaken. In 2000 an increase of efficiency can be detected. This finding supports the fact, that the regression curve determined by the factors calculated from the data of 90’s cannot describe the process of 2000.
4. Notices how to use the findings of the paper

On grounds of my findings I make the following suggestions for the economic actors. These are the followings:

For the government:
1. In connection with the state subsidies:
   a) It has to be avoided to decrease the interest rate of loans below the deposit rates. The low rate of loan raises further the credit risk and the size of subsidized will be greater than purposed.
   b) Near the home building the renovation and maintenance need to support regarding to the fact, that there is qualitative lack of home rather than quantitative and structural one in Hungary.
2. In connection with the mortgage execution:
   a) To cancel the upper limit (5 year) of call option in case of mortgage.
   b) To decrease the cost of execution through change of law on execution. The executor cannot account cost without invoice, furthermore the charges independent from success of collection must be cancelled.
   c) The execution must happen on vacant flat, so the subject of auction must be without any burden.
   d) The obliged of mortgage should be the current owner of property (Danish example)
3. In connection with the building societies:
   a) To index the upper limit of subsidy with the consumer price index. The percentage size of subsidy should be determined to reach the current yield of state securities.
   b) The changes should regard only to the new contracts.
   c) The presaving period should not be decreased due to the unfavourable effect on credit risk.
   d) To cancel the maximum loan size of 50% in contractual sum, that the banks can offer more various products. The general and individual value indicators mean satisfied obstacle.
   e) The employers could make contract without calling the beneficiary.
4. In connection with mortgage bonds:
   a) To increase the investment limit in case of investment funds, insurance companies and pension funds. Currently at insurance company the limit is 30% of investment, at obligatory pension fund it is 30%, at investment funds is 25%. Due to low risk exposure I should consider to classify the mortgage bonds issued to finance the home loans with state subsidy as state securities.
   b) The mortgage bonds should be accepted by MNB as collateral of open market operations.
5. In connection with total loan fee indicator (THM) of home loan:
   a) The total loan fee indicator (further THM) is the internal rate of return, which ensures, that the capital and other fees equal to the amount of loan which is decreased the fees and terms payable by customer at granting. With equation:
   \[
   \sum_{i=1}^{n} \frac{A_k}{(1 + r)^i} = \sum_{j=1}^{m} \frac{B_j}{(1 + r)^j} \]
   b) In calculation of THM the payment obligations must not be taken into account, which came from the neglecting of contract obligation, or they are not the income of credit institution (registration fee, solicitor fee, property appraisal fee, etc). Similarly the fees and costs must also not be taken into account which are caused by the contract modification required by the customer.
   c) The credit institution can not charge other costs and fees besides of fees taken into account in THM calculation in case of performance by contract.
   d) The following way of calculation must be used to determine the THM.
      i) if the annual fees are vary over time, but their size can not be determined in time of calculation, the last known fees must be consider as unchanged fee;
      ii) if the contract prescribes a period for payback, than the starting time must be consider, if the granting is linked to period, then the starting time of period must be consider as the day of granting;
      iii) if the interest rate used by bank can vary by credit risk, than the rate available for customer with lowest risk (prime rate) must be consider;
      iv) if the fees and costs has got a minimum and/or maximum limit, than a loan facility of 3 million forint with 10 years term must be supposed and the fees must be determined.

For commercial banks:
1. In connection with management of credit risk
   a) To employ computer based multivariable statistic analysis (discriminance analysis) to explore the credit risk.
   b) To use the gross annual income instead of monthly ordinary income by determining the upper limit of loan

17 A_i: sum of loan number i, reduced with the cost paid for financial institution related to raising loan,
    B_j: sum of instalment number j, increased with the cost paid for financial institution related to raising loan,
    n: number of home grant,
    m: number of instalments,
    ti: time of loan grant number i,
    tj: time of instalment number j,
    r: hundredth of total loan fee indicator.
c) To get independent specialist to appraise the property  
d) To examine not only the applicant’s income and bank connections, but also to pick information about the stability of his/her position (residency, stability of job, convicted or not, etc.)  
e) To enclose a notary closure to the loan contract.  
f) To get information from land registry about the registrations in case of default.

2. In connection with market risk management  
a) To hedge the interest rate risk with future selling of T-bills, swap deals on the money market)  
b) To issue security to finance home loans  

3. In connection with loan products  
a) To use more flexible repayment schedules (naturally in case of proper debtor qualification).  
b) To introduce endowment mortgage loan with a strategic partner insurance company  
c) To offer loans with variable and fixed rate as well. The size of variable interest should be made dependent from a well tracing money or capital market rate. The yield should be the function of liabilities with proper maturity  
d) To employ low interest rate and gain profit on other charges and fees.

The research is worth implementing in two ways. Firstly the international comparison could be enhanced, or expanding to the East-Middle European countries. The International Mortgage Association has got a data base for it, which isn’t cost free. It is worth testing in data of more countries, if the mortgage lending encourages to increase of owned flat, to make the population more mobile, to stimulate the economy. It would be especially interesting to compare the data of two country group – East-Middle European countries and the EU and USA – by cluster analysis.  
The second direction, which I should have liked originally to deal with, is to work out a professional system of credit judgment supported by computer. I should have liked to make the discriminance analysis known at the Yorkshire Building Society with the data base of a Hungarian bank. Unfortunately, the OTP hasn’t got a full scale data base about the debtors, the FHB data base is only partly filled, the other banks lent too few loan, that I can’t get reliable result. However there would be big need to make such system, because the banks are forced to standardize the credit judgment due to operating reason.
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