THE ROLE OF THE HOUSING MARKET IN MONETARY TRANSMISSION[1]

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INTRODUCTION

Housing may be considered mundane, an ordinary part of a household's everyday life. However, it can also be a rather complex economic phenomenon, as dwellings can have several functions. Apart from being the traditional 'roof over one's head', a house can serve as a source of wealth accumulation, a valuable item for bequest motives, or a form of investment. Another distinctive characteristic of housing is its sizeable share in household wealth, implying its importance in the household's decision-making process. As a result, shocks to the housing market can have a significant impact on household behaviour, and on the economy as a whole.

The housing market is more complex than the consumption goods market in a number of ways. Not only are the standard economic agents present; other institutions, such as mortgage markets and governmental subsidy/tax regimes, also play a role. Due to the complex interactions among these agents, it is important for policymakers to understand the mechanisms that drive housing market dynamics.

Taking note of the aforementioned distinctive role of dwellings, we attempt to analyse the role of the housing market in the Hungarian monetary transmission, as part of the monetary transmission studies of the Magyar Nemzeti Bank. Section II provides stylised facts about the housing markets of developed countries and gives a brief description of the Hungarian housing market. Section 0 provides an overview of the theoretical background of transmission through the housing market. Section 0V presents the empirical estimates, for Hungary, of the effect of interest rates on the behaviour of the household sector. Section 0 discusses the expected effects of the single monetary policy of the eurozone on the Hungarian markets. Finally, Section VI presents the conclusions.

STYLIZED FACTS

HOUSING MARKETS IN DEVELOPED COUNTRIES

Mortgage regimes play an important role in determining the key indicators of housing markets in developed countries. Three different types of mortgage regimes, namely fixed callable, fixed non-callable and variable, can be found in developed countries. Most countries can be characterised by the dominance of a particular type that has, historically, become the most relevant.

Analysing the countries individually, Denmark and the US belong to the first group, which can be labelled as *fixed callable* mortgage markets. These highly efficient and mature financial markets are able to provide mortgage loans that have fixed interest rates for up to 10-15 years and have the flexibility needed for the early repayment of long mortgage loans. It is not surprising that very few countries belong to this group. Both the US and Denmark have above-average owner-occupation rates, as well as very high mortgage/GDP ratios, indicating the significant role of mortgages in the economy.

The second group consists of countries where the majority of the mortgage loans have *fixed interest rates*, but early repayment is constrained by high fees. Most of the continental European countries belong to this category, which can be further split into two subsets. The first subset is represented by Germany and the Netherlands, with both countries having a high level of mortgage loans. The historical commitment of policymakers to price stability in these countries has created a favourable environment for high turnover at low and fixed long-term interest rates. In other aspects, however, the two countries have some extreme features: the ratio of owner occupation is the lowest in Germany among all the countries in our survey, while the Netherlands has surprisingly high loan-to-value (LTV) ratios, on average exceeding 100% in the case of new mortgages[2].

In the second subset of countries with long fixed interest rates, the mortgage loans do not play an equally significant role in the economy. France and Italy belong to this group, with traditionally low mortgage debt/GDP ratios of 22% and 10%, respectively. The mortgage markets in the third set of countries are characterised by *variable interest rates*. The UK has been the most traditional example of variable-rate mortgages, with a high mortgage debt/GDP ratio (60%), close to those in the first group. Apart from the UK, the fast growing mortgage markets of Portugal and Spain are also dominated by variable rates. These eurozone members benefit from low interest rates, considering that, prior to the nominal convergence, the high interest rates generated liquidity constraints for the majority of households. In Portugal, the mortgage debt/GDP ratio was 47% in 2001, equal to that of Germany, whereas a decade earlier, it was comparable to that of Italy (12%).

It is worth noting the difference in household preferences between Portugal and Italy. While both countries had experienced significant liquidity constraints prior to eurozone membership, and now as euro area members face low and very similar interest rates and economic policy frameworks, households in these two countries responded entirely differently to the easing of liquidity constraints. In contrast to the situation in Portugal, families in Italy do not have a strong tendency to rely on the financial system to solve housing problems, as indicated by the country's permanently low mortgage debt/GDP ratio.

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[2] The substantial incentives for mortgage payments in the tax regime provide an explanation for the extremely high LTV ratios in the Netherlands.

Short history of the Hungarian housing market

At the beginning of the transition in the early 1990s, there was no mortgage market to speak of in Hungary. Although there was a considerable amount of outstanding subsidised housing loans during the socialist regime, the government decided to abolish the subsidy on account of the rising budget deficit, which attended the collapse of the centrally planned economy.

In 2000, more than 10 years after the loan subsidies were abandoned in the last years of the socialist regime, the government introduced interest subsidies to long mortgage loans for new housing constructions. The main rationale for instituting the new housing policy measures was the fact that the number of new housing constructions had been declining throughout the '90s. This decline was, to a large extent, due to the lack of house financing: households could rely only on their savings to finance housing investment.

Early governmental measures promoting only new housing constructions facilitated the development of a mortgage regime similar to many EU countries, with the dominance of fixed non-callable mortgage loans. Although these measures did not have a major macroeconomic impact, they gave an impetus to the previously inert mortgage market. In 2000, the households' mortgage debt/GDP ratio started to post some growth. To further foster this growth, although to a smaller extent, the government extended the subsidy to buying existing dwellings as well. Meanwhile, macroeconomic conditions had also become favourable: the inflation rate dropped below the 7% target at end-2001, while the yield curve showed a steep negative slope, reflecting investors' confidence in the profitability of the convergence play strategy in the Hungarian government bond market. The new government measures, along with the favourable macroeconomic conditions, resulted in a gradual increase in mortgage loans, with a monthly average of HUF 15 bn of new loans granted in 2001. However, the outstanding stock by the end of the year still did not exceed 2% of GDP.

The year 2002 brought dramatic changes to the mortgage market. Government subsidies directly targeting households were increased significantly at the beginning of the year. Moreover, through subsidies linked to funding costs, bank margins climbed to 8%. Meanwhile, the subsidy scheme was exhibiting a rather unusual feature: the interest burden of households was not sensitive to market rates; all interest rate risk was with the central budget. The most general mortgage type was a 15-20 year loan, with the interest rate fixed for 5 years and a cap on interest paid by households at 6% for existing dwellings and even lower for new constructions. These rates were even significantly lower than benchmark government yields at that time.

The subsidy scheme was clearly not going to be sustainable. Under the scheme, even households that would otherwise not have considered taking out a mortgage loan in the near future, were applying for loans simply to take advantage of the

favourable conditions. This resulted in such a sudden and significant rise in mortgage loans that, by the middle of 2002, the mortgage market had started to post exponential growth. In the second half of the year, the volume of new loans originated in 2 months exceeded the total volume originated in the previous year. However, the government was slow to respond. It decided to cut the subsidies substantially only in December 2003, amidst serious concerns about the external and internal stability of the Hungarian economy.

The tightening measures primarily attempted to cut the budget expenditures on interest rate subsidies. Given the lower subsidies for the new loans, banks' profit margins declined, parallel with the significant increase in the interest burden of households. Furthermore, the changes to the subsidy scheme gave rise to two new features: mortgage rates became partly linked to market rates, and the difference between subsidies for new and existing housing widened from 1 to around 3 percentage points.

THE THEORETICAL FOUNDATIONS OF TRANSMISSION

This section discusses the three main theoretical channels through which the housing market and related economic forces influence the behaviour of households: (1) the interest rate channel; (2) the asset price and wealth effect; and (3) the credit channel.

INTEREST RATE CHANNEL

Monetary policy can have a direct impact on the behaviour of households through the interest rates on mortgage loans, providing a significant channel of monetary transmission. The shorter the interest rate period of a loan, the stronger the effect of the key interest rate on the mortgage rate. In case of variable rate mortgages, first, re-pricing occurs faster, and second, changes in the key interest rate have a stronger effect on short rates. Thus, variable rate mortgages provide a direct and efficient channel for monetary transmission.

If, on the other hand, rates are fixed for longer periods (for instance, 5 years), then changes in the key interest rate would have only an indirect effect, in two stages. The first step involves the impact of changes in the key interest rate on the yield curve at maturities relevant for mortgage loans. It is important to note that, in general, the effect will be declining at longer maturities. The second step is related to the length of the period with a fixed rate. Market rates are relevant only at the beginning of a new interest rate period. Thus, while having an immediate impact on new loans, they exert only a gradual effect on the outstanding stock of existing loans.

Another feature that should be considered in the case of fixed loans is the possibility of early repayment. If debtors can refinance with low transaction costs (having callable loans), then the transmission mechanism becomes asymmetric. During periods of declining interest rates, debtors will take advantage of lower rates, reducing monthly instalments and/or increasing the amount of the loan. This is an

immediate reaction to lower rates. Increasing rates, on the other hand, do not imply any changes in the behaviour of households, as debtors keep servicing their loans with the original fixed rates. Monetary tightening has no immediate effect on household behaviour; its impact can be discerned only at the beginning of the new interest rate period, as discussed above.

ASSET PRICE AND WEALTH EFFECT

In theory the price of an asset is the net present value of future dividends (D) that it can earn, that is, $P_0 = \sum_{t=1}^{\infty} E[D_t]/(1+r)^t$. However, before we apply asset price theory to housing investment, we should re-examine the role of dwellings.

The determinants of house prices are examined in empirical literature as well (for instance, see Cho (1996), Mayer and Somerwille (1996)). Muellbauer and Murphy (1997) introduced the following equation for house prices:

$$P_t = g(H/POP, y, r, \Delta P/P, M, ...) \tag{1}$$

where *H*, *POP* , *y*, *r* and *M* denote demand for housing, population, average real income, interest rate, and a proxy for credit/mortgage rationing, respectively. Two points are worthy of note. First, Muellbauer and Murphy (1997) show a fairly stable house price-to- income ratio. Second, recall that return on housing investment (*R*) equals $R = (E[D_{t+1}] + E[\Delta P_{t+1}])/P_t$ in asset price theory, which suggests that this return could be related to returns from any other investment form.

In the case of consumption, the BoE model (2000) uses the modified version of the error correction consumption equation originally suggested by Hendry and Ungern Sternberg (1981). In the BoE model, households' wealth consists not only of net financial but also housing wealth. When house prices rise, total housing wealth does so too, which implies a positive adjustment to consumption through the error correction mechanism. Case et al (2001) and Girouard and Blöndal (2001) also found an empirically significant positive relationship between housing wealth and household expenditure. Based on this, the consumption function can be formed the following way:

$$\Delta c_t = \alpha_0 + \alpha_1 \left(c_{t-1} - \beta_1 y_{t-1} - \beta_2 w_{t-1}^f - \beta_2 w_{t-1}^h \right) + \alpha_2 \Delta c_{t-1} + \alpha_3 \Delta y_t + \varepsilon_t \tag{2}$$

where *c*, w^f and w^h denote consumption expenditure, financial and housing wealth, respectively.

In order to simulate the wealth effect on consumption in Hungary, we use the Hungarian Quarterly Projection Model (MNB (2004a)) in which the consumption function contains housing wealth, and the housing investment function is based on the aforementioned portfolio choice approach.

CREDIT CHANNEL

If mortgage repayment is tied to the value of the collateral, namely dwellings, changes in house prices alter the amount of monthly repayment by changing the risk premium. Increasing house prices reduce, while decreasing house prices increase, the risk premium. Thus, changes in house prices either increase or decrease the amount of monthly repayment, thereby influencing the ability to repay, and the possibility of default.

TRANSMISSION IN THE HUNGARIAN HOUSING MARKET

INTEREST RATE CHANNEL

We expect mortgage loans to have a weak direct impact on households' disposable income in Hungary, for two reasons. First, despite dynamic growth in recent years, the outstanding stock of mortgage loans is still low compared to that in developed countries. Second, the key interest rate affecting the yield curve has had only a minor impact on the interest burden of mortgage loans due to the features of the government subsidies effective until 2003. Apart from the government subsidies, the fixed non-callable mortgages dominating the Hungarian market result in a delayed effect of interest rate changes, similar to many eurozone countries.Our results show that a one-percentage-point change in the market rate induces a negligible change in the disposable income of the household sector and, thus, in aggregate consumption expenditure.

ASSET PRICE, WEALTH EFFECT AND CREDIT CHANNEL

In order to determine the wealth effect of monetary policy on housing investment and private consumption, we first have to estimate the relationship between the interest rate and house prices. Using the resulting price elasticity coefficient, we can then simulate the following: (1) the effect of interest rates on house prices, and thus on dwelling investment, and (2) the effect of altered housing wealth on consumption.

As previously discussed, house prices can be modelled within an error correction framework. Previous studies used simple time-series techniques. However, due to the short sample period, this is not feasible for Hungary. Instead of using aggregated time series we apply panel data where the cross-sectional variance comes from the geographic separation. The economic rationale for using national cross-sectional data lies in the fact that the mobility of Hungarian households between regions is very low. Thus, regional time series are not explanatory variables for each other.

Based on the estimation results, we are able to simulate the effect of the interest rate on relevant household variables, such as housing investment and consumption expenditure. We use, for the simulation, the Hungarian Quarterly Projection Model (MNB (2004a)) in which the consumption function contains housing wealth, and the

housing investment function is based on the aforementioned portfolio choice approach, and we extended the model with our new house price equations.

Table 1 Transmission through the wealth and credit channel

		House prices		Housing investment		Consumption	
long-run interest rate elasticity of house price		-0.012	-0.031	-0.012	-0.031	-0.012	-0.031
		min	max	min	max	min	max
1st year average		-0.60	-1.14	0.00	0.00	0.00	-0.01
2nd year average		-1.22	-2.89	-0.39	-0.56	-0.05	-0.11
3rd year average		-1.19	-3.07	-0.70	-1.13	-0.11	-0.26
4th year average		-1.19	-3.05	-0.70	-1.02	-0.14	-0.34
5th year average		-1.19	-3.05	-0.69	-0.88	-0.13	-0.35

* 1 percentage-point permanent increase in mortgage loan rate. Results are displayed as the percentage differences from baseline.

Table 1 shows the simulation results of a one percentage-point permanent increase in the mortgage loan rate. Evidently, house prices decrease by 1.2 and 3.1 percentage points. Declining house prices are only one source of decreasing housing wealth. Higher interest rates and lower house prices also discourage housing investment. According to the simulation, this effect could be around 1 percent. Lower house prices and dwelling investment alter the real wealth position of households, which should influence consumption decisions. Since a consumer loan secured by dwellings is not very common in Hungary, it is not surprising that declining housing wealth has a rather moderate effect on consumption. It should be noted that the changes in consumption expenditure shown above stem merely from the housing market; we ignore any other relationship between interest rate and consumption.

ON THE WAY TO THE EUROZONE

Understanding the main features of the transmission mechanism in the eurozone could help policymakers to facilitate the convergence of the Hungarian housing and mortgage markets to structures prevailing in the eurozone.

By and large, there is a sizeable outstanding stock of mortgage loans and the mortgage debt/GDP ratio has been growing steadily in the eurozone, not least due to the effects of the convergence of nominal yields. However, the transmission effect of

residential mortgage loans is rather limited, as the bulk of the loans in the biggest countries are made up of long, non-callable loans. Mortgage markets are liberalised, as reflected in the growing heterogeneity of the new contracts across countries. However, on an aggregate level, the competitiveness of the eurozone mortgage market is well behind that of the UK market, where households have a better opportunity for housing equity withdrawal and can thus significantly ease liquidity constraints to smooth consumption.

FUTURE DYNAMICS OF HUNGARIAN MORTGAGE MARKET

As we look forward to the adoption of the euro, it is logical to assess the future of the Hungarian mortgage market in light of the experiences of current eurozone members. We have seen in section II that Portugal and Italy are the two extremes in terms of mortgage market developments. Portugal is the typical example of a liquidity-constrained market where demand for mortgage loans grew extremely fast, alongside interest rate convergence. In Italy, on the other hand, there was a rather moderate increase in demand during the years of convergence.

However, apart from the foregoing, another factor should be considered in studying a small open economy using its national currency, such as Hungary. Since a significant part of the transmission mechanism through the housing market is related to the indebtedness of the household sector, the net financing position of the household sector also needs to be taken into account. In other words, apart from structural features, the sustainability of the net position of the domestic sectors, as reflected in the current account, can also influence the speed of adjustment in the run-up to euro adoption.

FX loans became increasingly popular in 2004 among households facing the higher forint mortgage rates. The strong mortgage demand suggests that Hungarian households were willing to pay a high price, namely the imminent exchange risk, to loosen liquidity constraint. The growing popularity of FX mortgage loans provides an additional transmission channel on the one hand, as high domestic rates rather shift mortgage demand to FX loans, and leads to the build up of the non-hedged FX position of households, raising stability-related concerns, on the other.

Although it is still quite early, just a few years after the start of mortgage lending, to forecast the mortgage/GDP level which could be considered as the long-run equilibrium for Hungary after euro adoption, the popularity of FX loans points toward high equilibrium mortgage levels. Considering that Hungarian households have gotten so easily used to the wide range of mortgage products, encouraging them to take on significant exchange rate risk to improve access to mortgage loans, Hungary will likely not follow the moderate path observed in Italy. Rather, mortgage developments in Hungary will, more likely, mirror the dynamics observed in Portugal, where mortgage loans rose to almost 50% of GDP in less than ten years.

CONCLUSIONS

Based on the international experiences and the evolution of the Hungarian mortgage and housing markets, the following conclusions can be drawn regarding the monetary transmission mechanism.

- While monetary policy has a quite significant effect on consumption, it exerts a rather limited impact on housing investment and house prices in Hungary.
- The transmission through the interest rate channel is negligible at the macroeconomic level, for two major reasons. First, notwithstanding its exponential growth in the last years, the ratio of mortgage indebtedness to GDP in Hungary (8%) is still low compared to those in developed countries (40-60%). Second, the Hungarian mortgage market is dominated by long, non-callable loans, which creates a weak and delayed link between key policy interest rate and mortgage rates.
- The wealth and credit channel could be discerned in the Hungarian data, with theoretically consistent parameters, although transmission effects on house prices, housing investment and consumption are rather limited.
- A further transmission channel related to house equity withdrawal, the 'borrow more' effect, has had a significant impact on household consumption in recent years.

There are various factors determining the future dynamics of mortgage markets until and after the adoption of the euro. During the convergence process, the sustainability of the net saving position of the domestic sectors can constrain the growth of household indebtedness. Recent experience shows that high domestic mortgage rates shift demand towards FX loans, rather than decrease the overall demand for mortgages.

It could take decades after euro adoption to reach the equilibrium mortgage debt/GDP level. Given the fast growing loan demand of households, particularly the popularity of FX loans, the possible dynamics in the Hungarian market might mirror those of Portugal, where the mortgage debt/GDP ratio increased from 10% to almost 50% in less than a decade.

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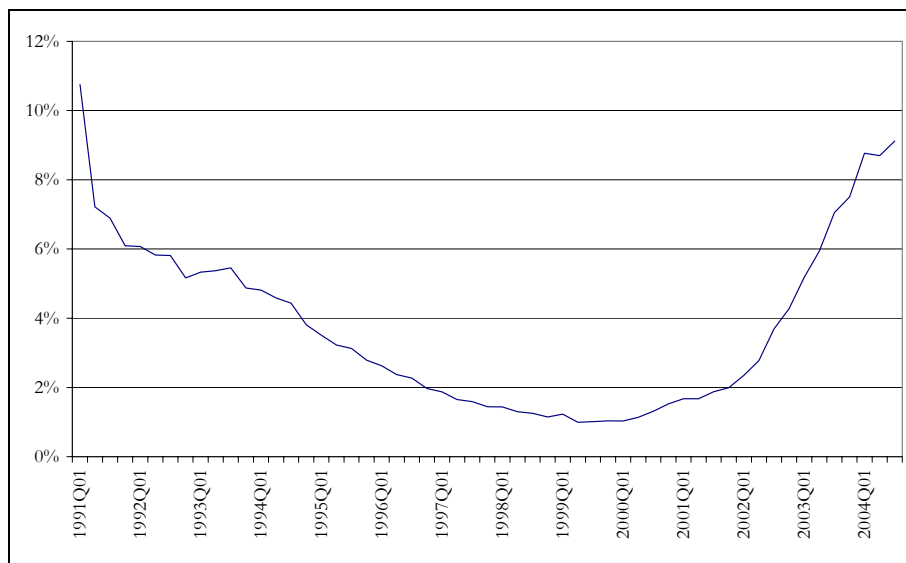Zsoldos, I (1997)   'Savings and Portfolio Decisions of Hungarian Households, 1980-1996' Working Paper No.1997/4, MNB

Figure 1. Debt servicing to disposable income (1995=100)
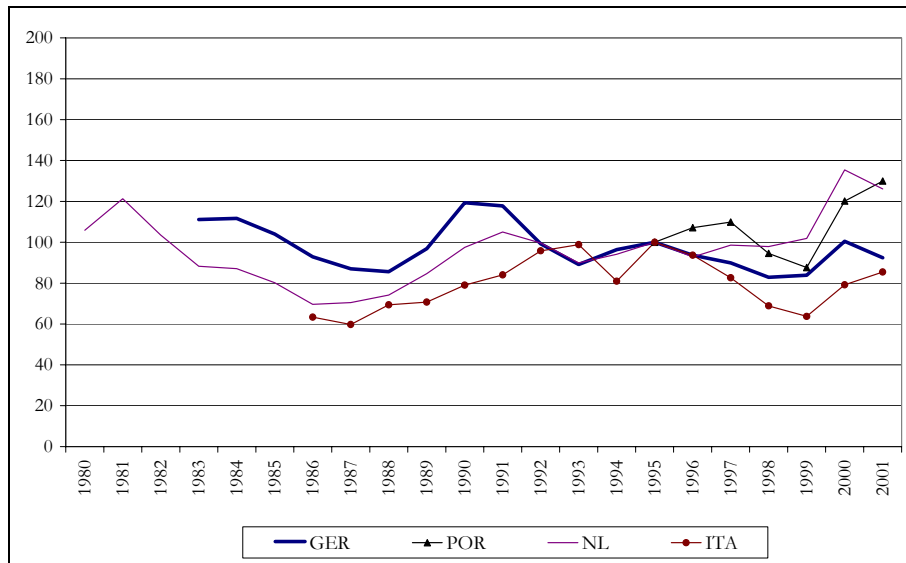
Source: ECB

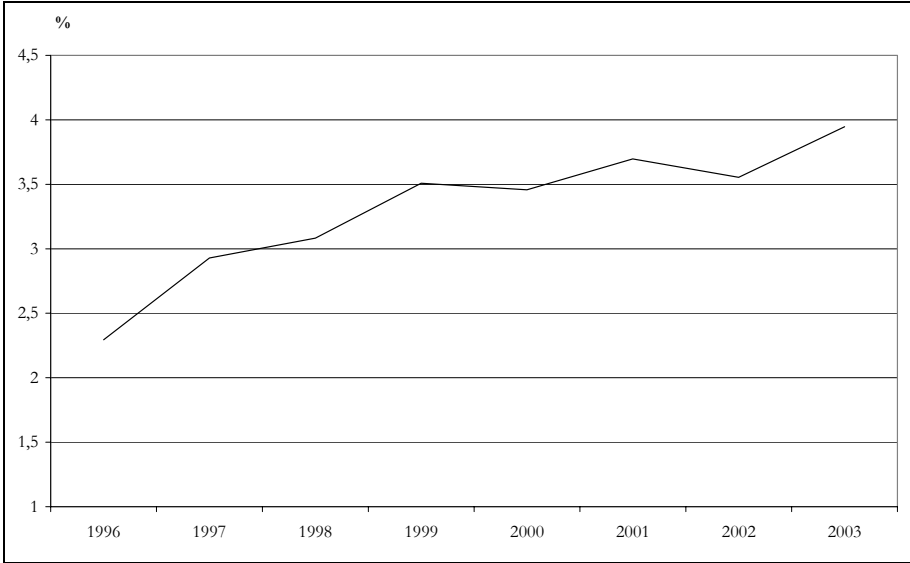## Figure 2. Mortgage/GDP in Hungary

Source: MNB

Figure 3. Housing transaction/housing stock *in Hungary*

Source: Ministry of Finance