Doctoral School of Economics and Business Informatics

THESIS SUMMARY

to the Ph.D. dissertation by

Zita Fellner

Hungarian household borrowing processes

Supervisor:

András Sugár PhD

associate professor

Budapest, 2022

Department of Statistics

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I. Research Background and Motivation

Economic role of borrowing

Retail borrowing processes are the subject of both macroeconomics and microeconomics. The macroeconomic importance of credit is given on the one hand by its contribution to economic growth, and on the other hand by its impact on financial stability.

(1) The connection with economic growth is created by the fact that the banking system and non-banking intermediaries are connected directly and indirectly through the asset markets to households, companies, the state, but also to the foreign economy (see, for example, Bernanke and Gertler 1989, Gilchrist et al. 2009, Claessens et al. 2012). These connections between the macroeconomy and the financial sector ensure that a stress situation or imbalance in one segment can spill to other sectors, causing a national or even international crisis from the sub-markets. Financial crises highlighted the role of lending and financial intermediaries in economic fluctuations (one of the first mentions of this is Fisher's 1933 work *The debt-deflation theory of great depressions* about the economic crisis of 1929). The

importance of lending to the private sector is also supported by the empirical observation that a higher degree of financial deepening – measured by the credit to GDP ratio – is the characteristic of the more developed economies. Although this is not necessarily a causal relationship, according to the literature, financial deepening in less developed economies contributes to a more efficient distribution of resources, while at the same time "too much finance" leads to inefficiency and thus has a negative effect on economic growth (Arcand and al. 2012, IMF 2015). Another relevant direction of research was whether, after a recession, growth is sacrificed in case of a creditless recovery (Calvo et al. 2006, Huntley 2008, Abiad et al. 2011).

(2) Meanwhile, the financial stability aspect draws attention to the fact that the expansion of lending can lead to the accumulation of risks, and if these risks materialize – even for reasons outside the financial system – they can lead to a recession with real economy consequences. Rapid credit growth over a short period of time carries the risk of financial crises, which is why, for example, credit dynamics is one of the early warning indicators (Hawkins and Klau 2002, Drehmann and Juselius 2013). Moreover, in order to identify market processes that threaten

financial stability, in addition to the micro-prudential supervision of the actors, the analysis of systemic risks is also necessary (macro-prudential supervision). In the procyclical credit market, the economic and business environment encourages intermediaries to take excessive risks. One example of this is the financing of customers with increasingly poor credit repayment ability at the mature stage of the credit cycle, which accumulates risks at the end of the cycle that, during the crisis episode, entail high social – and possibly economic – costs that are realized afterwards. Economic actors therefore have a kind of collective tendency to increase their risk exposures during booms (then systemic risk accumulates), but in times of crisis they become excessively risk-averse (then systemic risk materializes).

From a microeconomic point of view, borrowing is a means of consumption smoothing. In this context, Irving Fisher's consumption theory based on inter-temporal budget constraints (1930), Franco Modigliani's life cycle hypothesis (Ando and Modigliani, 1963) and Milton Friedman's permanent income hypothesis (1957) are relevant. Households strive to smooth the impact of income fluctuations in the long term by saving and borrowing, thus ensuring an optimal level of consumption for

themselves. However, if certain households are faced with liquidity constraints in certain periods, they are unable to achieve the level of consumption resulting from their rational decision: they only have limited or no borrowing options. If households consider that they may be in a liquidity-constrained situation in the future, this may also affect their behaviour in the non-constrained period (Romer 2012). The simple description of the decision of the households is further complicated by the fact that the "taste" of the household may change over time (for example, when the number of people in the household or the structure of the household changes); and high-value durable goods and assets, in addition to their own utility, can also serve as collateral for later borrowings, thus expanding the set of possibilities for a household.

Factors affecting liquidity constraints

The evolution of liquidity constraints is the result of a multifactorial process that changes dynamically over time. Therefore, it is not evident which households and in which periods face liquidity constraints. To identify potentially liquidity-constrained groups, we must take these factors into account:

(1) Legal/administrative constraints. After the 2008 crisis, debt cap rules were introduced in many economies, which set minimum entry requirements for households with credit demand. The introduction and calibration of these rules represent administrative constraints that are difficult to foresee for households.

(2) Banks' risk appetite. The rationality of the financial intermediation market makes lending procyclical. On the credit supply side, this sets slowly but constantly changing conditions for participation in the credit market: it is easier to get a loan at certain stages of the cycle, and more difficult at others.

(3) Individual life situation. The individual's opportunities also change with the development of his own life situation: he does not have access to financing, or not to the same extent, after an increase in income or a change of job as before.

In this multifactorial relationship system, some of the households eventually get a loan. However, the possibilities can fundamentally change even over a period of several years.

Research questions

Retail lending is a dynamically developing and at the same time under-researched segment of the economy, interwoven with economic policy and social science consequences. One of the goals of my thesis is therefore **the historical contextualization of retail lending processes from a macroeconomic point of view**. Banking system lending moves closely together with the fluctuations of the economy, so knowledge about the cyclical position, the developments of regulation, the state programs available through lending – which serve as a background for borrowing decisions and opportunities – is essential in order to interpret the results of an investigation based on statistical data adequately.

Another goal of my thesis is to explore the circumstances of borrowing and indebtedness. Through this, we can get an idea of the operation of liquidity constraints. Although data content does not allow the separation of demand and supply factors, the identification of potentially liquidity-constrained social groups

brings us closer to the discovery of the actually liquidity-constrained groups.

Detailed micro-level data on the expansive phase of the second domestic credit cycle, 2013-2017, are available. The research concerns the two most important credit products of the examined period, housing loans and personal loans. My research question can be summarized as (1) who, (2) when and (3) how much borrows.

1. The range of borrowers

What sociodemographic, income, labour market and indebtedness differences can be identified between borrowers and other employed people?

2. The timing of borrowing

How does the time of borrowing relate to the time of the change in the individual's income or labour market situation, and how do socio-demographic and indebtedness variables affect this?

I examined the effect of four events that, according to my preliminary hypothesis, could have a significant influence on

borrowing: (1) decrease in income; (2) increase in income; (3) change of workplace; (4) change of occupation. These can affect the borrowing through the bank's credit assessment and the individual's adaptation to the changed situation (i.e. from the point of view of both supply and demand).

3. Loan contract size

How do sociodemographic, income and indebtedness factors affect the contract size?

The question is interesting because the different contractual sizes of loans may also indicate a liquidity constraint: although the given individual is not forced out of the household credit market, the level of indebtedness is limited.

II. Methods and Data Used

For the purpose of the historical context, I used macro-level and aggregated data from publicly available datasets and statistical publications.

I worked with unique datasets for the empirical econometric analysis. One of the data sources is the data received from the Central Administration of National Pension Insurance, which contain the incomes of all Hungarian employees subject to taxation, separately from each contractual relationship. Based on these, personal monthly incomes can be calculated, and changes in workplace and occupation can be identified for each individual. In addition, the data also contains the basic sociodemographic characteristics of the individuals.

Another source of my data was the Central Credit Information System, which provided a broad overview of borrowing and outstanding debts. The databases obtained by merging the two sources are the most comprehensive of the analysis tools known so far, so that the borrowing processes of the population can be researched.

I answer the research questions with econometric methods, linear regression and linear probability model estimated by ordinary least squares, as well as logistic regression models estimated by maximum likelihood.

During the data analysis, I narrowed down the concept of borrowing to housing loans and personal loans, since these two loan products accounted for a significant part of the loan market in the period under review. In the research, I took into account all contracts issued by credit institutions between 2013-2017. There can be significant differences between the patterns of taking out different types of loans, which is why it is worth treating them separately.

(1) *Duration of decision.* The higher the debt's maturity, the longer the time that passes between the loan-taking decision and the spending of the loan (consumption or housing investment). This temporal differentiation is also due to banking activity: after submitting the loan application, in the case of housing loans, the handling of the various administrative burdens takes much more time (credit assessment, certificates, valuation) than in the case of

personal loans, which are at the customer's disposal within days or hours.

(2) *Different access to loan types.* Due to the debt cap rules, more conditions must be met for taking out a housing loan than in the case of an unsecured personal loans.

(3) *Different characteristics of loan types.* The decision to take out a loan is also influenced by the different contractual conditions of each type of loan. Housing loans are typically disbursed by banks with mortgage collateral, it can only be used for housing purposes, the contract sizes are higher, maturities are longer, interest rates are lower; while personal loans are unsecured with free use, but also with smaller contract sizes, shorter maturities and higher interest rates.

III. Results of the Dissertation

The aim of my thesis is to provide a comprehensive presentation of Hungarian household lending processes and access to credit through the analysis of macro-level and micro-level data. The aim of the macro-level analysis is the periodization of retail lending after the 1990 regime change by credit cycles and their stages. In the dimension of time, the classification systematizes the borrowing possibilities of the population, which also provides a framework for their appearance on the credit market. Micro-level data are available for only one phase of credit cycles following the regime change, the expansive phase of the second cycle. Thus, in the period between 2013 and 2017, I use them to examine the scope of potentially liquidity-constrained social segments.

Historical context – periodization of retail lending trends

- After the regime change, the first household credit cycle unfolded relatively late to the corporate credit market, starting in 2000. The expansive phase was accompanied

with interest-subsidized HUF loans, while the mature phase took place parallel to the rise of foreign currency loans. Then a rapid decline followed due to the 2008 financial crisis – in line with the procyclicality of financial intermediation –, and the recession period lasted until 2012.

- From 2013, the recovery and then the expansive phase of the second credit market cycle started. In this period, households make their borrowing decisions in a different regulatory and incentive environment: on the one hand, they have to comply with the debt cap rules since 2015 (which also contain a clause on interest payments from 2018), and on the other hand, the home-creation/family support system also encourages the population to participate in the credit market.

- From the second half of 2019, significant transformations took place in the retail credit market. First, prenatal baby support loans were introduced, which immediately rearranged the product structure. Then in 2020, the coronavirus epidemic and the isolation measures temporarily significantly transformed the size and

structure of the credit market. It is currently too early to state that the processes seen from 2019 represent the mature stage of the second cycle, as well as whether the coronavirus epidemic, the payment moratorium introduced in its wake, the return of inflation, interest rate increasing cycle started in mid-2021, or the unfolding energy crisis eventually have long-term effects on retail lending processes.

1. The range of borrowers

The first question was aimed at **who received a loan in the examined period according to demographic, income and occupational variables, i.e. what differences can be identified between borrowers and other employed persons**. For this purpose, I used regression methods to compare borrowers of the most numerous types of loans, housing loans and personal loans, with those who did not take out a loan in the given year. I present the differences between the groups in terms of socio-demographic, income, labour market and indebtedness.

- Based on my results, borrowing is less typical for women; this relationship also exists in the case of personal loans, which are smaller and shorter than housing loans, so taking them out is a less significant – and more often an individual, non-household-level – financial decision.

- If the individual received an allowance related to having a child in a given year, the probability of taking out a loan also decreased. Since this is more likely to be given to women, it provides a control for the drop-out in the labour market due to having children, confirming the partial effect of gender.

- It was observed that the probability of borrowing decreases with increasing age.

- Income and other existing debts have a positive effect on borrowing. While the former is intuitive, the latter requires explanation, although both reflect the same phenomenon: it proves the borrower's creditworthiness. Thus, we can say that the existence of other loans is a stronger indication that the prospective customer is

creditworthy than the lower burden capacity of income could hold back creditworthiness.

- The overall effect of changing workplace or occupation is negative on borrowing, just as – in accordance with credit assessment criteria – also reduces borrowing if the individual has been absent from the labour market for a while (unemployed or inactive).

- The particular interest of my research is that I also included the occupation of the individual in the models: I classified the employees into 42 groups defined by the Hungarian Central Statistical Office. The difference in status between borrowers of housing loans and personal loans was highlighted: while those employed in management-managerial and technical-informatics-science positions have the highest probability of taking out a housing loan, after controlling for the above factors, the personal loans are the lowest among these groups.

2. The timing of borrowing

My second question concerns **how the time of contracting a loan is related to the time of a significant change in the individual's income or labour market situation.**

- The relevance of the question is given by the striking observation that, according to the micro-level data, the mode of time between the last change in income and contracting is 1 month: for both product types examined, in about a quarter of the cases, the contract date followed the change by only one month, either in the case when this change was an increase or a decrease.

- In the case of an increase in income, this indicates impatience and a definite time preference: as soon as it becomes possible to realize the loan purpose by taking out a loan, the customers make this decision.

- In the case of a decrease in income, the same indicates the existence of moral hazard: this group of debtors appears with their credit demand in the banking system even before the lower income level would already

become evident during the credit assessment. At the same time, it can also represent the motive of fear of the restrictiveness of liquidity constraints in the future: since the limits are more likely to become effective with a permanently lower income level, the individual prefers to schedule the realization of the loan purpose for an earlier date.

- In the case of a decrease or increase in income, the time gap between the contract and the change in the income is shorter for women, younger people, people with higher incomes and those with other debts.

- Ceteris paribus, the time gaps between changing workplace or occupation and contracting a loan increase with higher income, and after changing jobs, men undertake debt service more quickly.

3. Loan contract size

Finally, the third question focused on the **factors explaining the heterogeneity of the contract sizes.**

- Based on my results, in the examined period, the gender of the borrower had a significant effect on the size of the borrowed amount: ceteris paribus, women received an average of HUF 675,000 less housing loans and HUF 52,000 less personal loans from credit institutions. For the significance of this, it is worth considering that the average housing loan amount was HUF 6 million, and the average personal loan amount was HUF 877,000.

- With regard to age, a quadratic relationship has been proven: while the equation explaining the range of borrowers shows the lower participation of older people in the credit market, in terms of contract sizes, both younger and older people may face liquidity constraints. The age where contract size is the maximum is 35 years for housing loans and 41 years for personal loans.

- The effect of income is intuitive, people with higher incomes take out larger loans. The negative effect of other existing debts supports the fact that the income of those who already have debts has less burden capacity – even though their existence had a positive effect on the fact of borrowing.

- In terms of occupational groups, the largest amount of credit went to managers of economic organizations and units supporting economic activity, as well as to health care workers with a higher degree of education. Those with lower incomes, employed in the primary sector or in the industrial and service sectors that do not require professional qualifications include those who, although they are creditworthy, the total amount of credit awarded may fall short of the level at which they could reach the optimal level of consumption.

IV. Practical Relevance

The analysed data comes from only one stage of the credit cycle (in earlier periods, such as during the 2008 crisis, there was no such detailed provision of data for credit contracts). Thus, it is definitely **worth investigating the evolution of access in those stages of the credit cycle where borrowing opportunities are narrowing**. Nevertheless, based on my research, **access to loans is unequal from many sociodemographic, income and labour market aspects**. Based on the available data, it is difficult to distinguish whether these groups (women, older people, people with lower incomes, workplace or occupation changers) are less present on the retail credit market for demand or supply reasons. However, the result, according to which **these groups are potentially liquidity-constrained**, is worth considering when creating economic policy (credit) programs that target these groups – or which, even in the absence of targeting, the decision-maker thinks are accessible to them as well.

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VI. List of Publications

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Other Publications

10. **MNB Trends in Lending** November 2016, March 2017, May 2017, August 2017, November 2017, August 2018, March 2019, September 2019, March 2020, March 2021, September 2021, March 2022

11. **MNB Housing market report** October 2016, May 2017, November 2017, May 2018, November 2018, May 2019, November 2019, June 2020

12. **Consumer loans in a new role – What explains the rise in personal loans?** Portfolio.hu (3 April 2019) (co-author: Marosi Anna)

13. **Variable interest rates: the problem that won't solve itself.** Portfolio.hu (3 July 2019) (co-author: Dancsik Bálint, El-Meouch Nedim Márton, Marosi Anna)

14. **The first year of prenatal baby support loans: who takes them out and what do they spend on?** Portfolio.hu (23 July 2020) (co-author: Marosi Anna)

15. **Recent MNB survey: the prenatal baby support loans provided substantial help.** Infostart.hu (9 October 2020) (co-author: Marosi Anna)

16. **Covid increased the use of digital banking solutions**. vg.hu (18 November 2021) (co-author: Marosi Anna)

17. **Who and why use cryptocurrency in Hungary?** napi.hu (25 March 2022) (co-author: Marosi Anna)