Behavioural Finance and Consumer Loan Contracts*

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Due to the situation that has emerged in the wake of retail lending, particularly foreign currency lending, every circumstance that leads to excessive systemic risks must be taken into consideration, namely the absence of consumer self-control, under- and overreactions and the risks stemming from intertemporal retail consumer decisions. The authors attempt to make consumer decisions understandable by analysing biased intertemporal models. Based on the relevant literature, the authors use a behavioural science approach to shed light using on the underlying factors of action or passivity, the factors that introduce bias into consumer rationality and their potential management, in particular asset regulation and the fair bank acts, deeper and more comprehensive regulation of legal relationships, keeping in mind not only the key interest of consumer protection, but also the predictable and sustainable long-term functioning of financial institutions.

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1. Introduction

Consumers' consumption-related decisions are often made not on a rational basis but in a manner describable using intertemporal choice models, accompanied by under- and overreactions. The organisations offering products and services are often familiar with and even exploit these decision asymmetries. They develop products and offer services for consumers using this acquired knowledge. The protagonists of the system of financial intermediation play a particularly important role. These protagonists play a key role in making available the funding needed for consumption, thereby determining future consumption. This lends particular relevance to the investigation of this topic.

* The views expressed in this paper are those of the author(s) and do not necessarily reflect the offical view of the Magyar Nemzeti Bank.

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Corporations, but particularly and specifically financial institutions, enhance and catalyse the decision-making process based on their knowledge of the key drivers and motives of consumer behaviour in an effort to maximise profits in a shorter amount of time. This behaviour necessarily fosters a biased, non-rational decision-making process that focuses on short-term benefits and ignores the medium- and long-term drawbacks and negative consequences. (Paradoxically, the characteristics of such behaviour exhibited by the management and shareholders of financial institutions are identical to those of irrational consumer conduct.) This process is further reinforced by information asymmetry and consumer impatience. Thus from the perspective of our topic, it is necessary to first analyse biased intertemporal models which give us an understanding of consumer decisions. Understanding the identified causes and motives can bring us closer to resolving the issue. Using a behavioural science approach, we can gain an understanding of the underlying factors of action or passivity.

2. A history of intertemporal decisions and the discounted utility model

Intertemporal decisions were first modelled by *Fischer* (*1930*) in 1930, who found that a comparison of the current perceived utility at various points in time depends on the marginal rate of substitution for the various points in time. The marginal rate of substitution is determined by the time preference and declining marginal utility. The discounted utility model created by Paul Anthony Samuelson was a major step forward in this area; it spread quickly and became highly popular mainly thanks to its simplicity, which resides in its capacity to condense numerous heterogeneous and diverse (psychological) factors into a single parameter, the discount rate, and regarding this discount rate as constant. On this basis, the utilities emerging at different points in time became easily comparable. *Samuelson* (*1937:156*) wrote that "during any specified period of time, the individual behaves so as to maximize the sum of all future utilities, they being reduced to comparable magnitudes by suitable time discounting. The individual discounts future utilities and some simple regular fashion which is known to us." Therefore, the model must be associated with positive time discount rates, i.e. a more distant point in the future will always have a lower perceived utility and will therefore reinforce consumption that is closer to the present. The discounted utility model treats the discount factor exponentially, in other words the ratio of perceived utility linked to current and future consumption will change constantly per unit (of time). The discounted utility model is therefore characterised by a constant discount rate and a time-consistent preference (*Bölcskei 2009*).

2.1. Hyperbolic and quasi-hyperbolic models describing present-biased preferences

It is no coincidence that the set of criteria presented above was increasingly questioned and contested. The constant discount rate and the consistent preference over time appeared unrealistically regular, even norm-like, with respect to which empirical studies yielded results that called the model into question. However, numerous experiments conducted in the context of behavioural economics refuted the discounted utility model. As a result of these, it also became clear that the behaviour of participants can be better described using a different discounting model. Hyperbolic and quasi hyperbolic models that describe present-biased preferences emerged from further research.

The model was amended several times before in *1992 Loewenstein and Prelec* finally created generalised hyperbolic discounting, which was capable of addressing numerous earlier anomalies and offering a more general description of human behaviour. However, it was more difficult to apply in more complex models (*Neszveda – Dezső 2012*).

The main tenet of quasi hyperbolic discounting is associated with *Phelps and Pollak* (*1968*) In essence, the discount rate that can be assigned to periods is inconsistent when choosing between periods and associates a higher discount rate to short-term time preferences. In comparison, quasi hyperbolic discounting also describes behaviour that is inconsistent over time similarly to hyperbolic discounting, but the model is simpler and easier to manage compared to hyperbolic discounting models (*Nagy 2011*).

2.2. Significance and applicability of hyperbolic and quasi hyperbolic models

"The significance of hyperbolic and quasi hyperbolic models lies primarily in the fact that they allow us to describe and explain human behaviours that were formerly indescribable" (*Bölcskei 2009:1027*). As a result of present-biased preferences, perceived utility associated with current consumption is assigned a greater weight than perceived utility associated with future consumption. Exponential discounting applied in a neoclassical context results in greater utility of current consumption compared to the utility of consumption at any later point in time. However, delaying future consumption as much as possible decreases the associated utility not just exponentially, but to an even greater degree. With regard to this, the individual becomes interested in consuming comprehensively, even in excess of his current financial means, or more precisely, to maximise the associated perceived utility. However, the latter depends on numerous other factors, and thus developments in the marginal utility of consumption, the size of discount rates, the expected developments in future income and interest on credit jointly determine whether the individual borrows or not.

The hyperbolic discounted model has become a popular area of application for studies of self-control issues. Why are hyperbolic models well-suited for describing issues of self-control? Self-control is fundamentally assumed of consumers by traditional neoclassical economics based on rationality. Rational consumers are, for instance, capable of ranking things based on utility according to the *Neumann and Morgenstern* (1953) rationality system. The consumer therefore has adequate self-control, in other words, he will not make irrational decisions precisely because he can control himself. The problem with this is that in reality, consumers often make irrational decisions that traditional economics are unable to adequately explain.

The matter of self-control issues provides a tool for giving an approximation of reality. In the case of an individual with self-control issues, divergence from rationality can be explained with this factor. Several authors modelled this, for instance *Camerer et al. (1997)*, who concluded in their paper on New York taxi drivers that drivers often defined their operation and the duration of their work time based on heuristic decisions. The authors argue that adaptive models rooted in psychology have better forecasting capacities in cases where the area under review is shaped by human decisions. Accordingly, hyperbolic models are able to adequately handle the situation: if we are unable to keep the desires embodying preferences under control, preferences automatically shift in time towards the present, we want to fulfil them as soon as possible and live out our desires. The mathematical formalisation of behavioural finance, which we will not address here for the sake of brevity, is further hindered by the fact that decisions are not single-periodic, but rather multi-periodic and are strongly shaped by risk and uncertainty (*Merton 1969*).

Broadly speaking, present welfare utility based on hyperbolic models is always far higher than future utility and therefore sudden profit in the present is much more attractive and likewise, immediate expense is always more painful than future expense.

3. Application of behavioural economic findings and intertemporal models in the financial sector

Consumer loans in a “legally regulated” framework – including a legal framework for enforceability – originated in the early 20th century. As their national economic significance increased in the wake of their effect on consumption, their widespread dissemination became inevitable. This process entailed the emergence and excessive growth of inadequate lending practices that triggered adverse social consequences that far exceeded the earlier periods.

It should be taken into account that the present-future exchange also works “backwards”, in other words an individual can take out a loan to be able to consume

in excess of his current financial means by giving up future consumption as a result of an inconsistent present-biased time preference. Consumers' time inconsistent behaviour presented above is not a novelty in the realm of bank lending.

Credit cards, which are becoming increasingly popular and are being used by more and more consumers in Hungary, are a typical form of consumer credit and their emergence has been the subject of widespread research. The following section presents the main findings of this research.

Laibson – Repetto – Tobacman (*2003*) reported that the ratio of credit card debt in the United States is salient, suggesting that consumers borrow a lot at a high cost. This process already includes irrational elements in and of itself, as the cost of credit card debt is far higher than money market interest rates. The paper also highlighted that the ratio of long-term de facto illiquid savings is also high, which assumes a hyperbolic discounting preference and fundamentally calls into question the possibility of exponential discounting. Consumer naïveté is identified as a possible explanation in the paper. The case presented in the *Ausubel* (*1999*) paper, considered a novelty at the time, is now considered a classical example of consumer overreaction. According to the study, credit card applicants are unable to estimate the future balance of their credit card with any measure of accuracy and expect to borrow lower or far lower amounts. This is due to the fact that they are unable to accurately recognise credit offered at very low interest during the introductory period and by the time this preferential period expires, the consumer is faced with an excessive repayment at far higher interest. In this scenario, consumers underestimate the loan amount actually taken out in the future and simultaneously overreact to the preferential low interest rate intended as an introductory tool. Besides under and overreaction, *Ausubel* (*1999*) also emphasised the phenomenon of adverse selection whereby if the consumer took advantage of the credit conditions offered with the introductory period instalment, you will have greater propensity to take out a larger credit amount. This finding simultaneously signals the risk of such behaviour to the creditor, as these customers are far riskier. By and large, the findings of the study may indirectly point to the emergence of moral hazard. The lending financial corporation is aware that with preferential offers, they can attract a customer base comprising increasingly more and increasingly riskier consumers. This process may therefore result in the creation of a stock of bad quality debt.

In their study of classic purchase loans, *Stango and Zinman* (*2009*) identified as a fundamental issue the fact that consumers are unable to adequately evaluate the actual cost of offers due to their illiteracy. As they are unable to do this, lacking the intellectual faculties and financial literacy, they are more likely to accept offers that are more disadvantageous for them. The paper also revealed that adequate information of consumers did not change the situation, nor did market competition

resolve the issue. Although a stock comprising consumers who seek out a more expensive service is more profitable in the short run, it leads to the emergence of credit risk in the medium and long run.

Koltay and Vincze (*2009*) summed up the essence of this as follows: "The most common causes identified are usually non-exponential discounting, naïveté and excessive self-confidence, alongside cognitive flaws such as the incapacity to perform mathematical and financial calculations and errors in objectively defining the decision-making situation. Evidence of hyperbolic (non-exponential) discounting, naïveté and excessive self-confidence tend to be indirect, and these hypotheses taken together seem better suited for characterising behaviour than exponential discounting and the assumption of total rationality." (*Koltay – Vincze 2009:513*). Banks offer numerous products to their retail clientele that specifically take advantage of this present-biased time preference. The *Sebestyén et al (2011)* paper contests that dynamically time inconsistent preferences played a critical role in the emergence of the issue, but the authors concede that waived upfront fees and preferential initial period interests are common methods in Hungarian lending today. Today, consumer loans that do not have to be repaid during an initial grace period have also become widely familiar to and accepted by consumers. Such offers are particularly attractive during busy periods of buying, for example before holidays. Bank offers that propose the soonest possible utilisation of the loan amount instead or alongside preferential repayment or a grace period are also based on the characteristics of a present-biased time inconsistent positive time preference. Pre-paid deposit interest schemes, where the credit institution credited the interest on the deposit made by the customer at the time the deposit was made also took advantage of intertemporal decision-making bias, allowing the customer to get the interest at the beginning of deposit maturity, to use or consume it immediately, with the bank essentially having lent the deposit interest to the consumer.

Bank lending can easily lead (and has led) to consumer borrowing where the debtor's inconsistent time preference, optimistic and excessively self-confident estimation of his future financial situation spur him to borrow credit that he is later unable to repay. The information advantage of financial intermediaries also contributed to the emergence of this lending practice. It is actually more accurate and professional to refer to information asymmetry rather than an information advantage, as bank products and services almost always require special know-how that most customers fully lack or only partially possess. The latter scenario may unfortunately result in even more severe consequences in the absence of the right professional background knowledge and general professional know-how than a total lack of professional know-how.

In order to gain more comprehensive insight on the topic, the matter of consumer impatience should also be addressed. Consumer impatience emerges when consumers are compelled to forgo consumer goods and delay their purchases for a given period of time. "Once the reason for temporarily forgoing consumer goods is resolved, deferred consumption is compensated for, due to consumer impatience. In such scenarios, the marginal propensity to consume is much higher" (*Tóth – Árvai 2001:1024*).

Although these behavioural patterns are detrimental in and of themselves, they may cause substantial macroeconomic harm if they affect a large portion of society. "There is such a severe lack of financial literacy within society that it impedes recovery and consolidation during cyclical economic crises" (*Kovács 2015:87*).

In line with the one-off examples and the findings of the literature, the affected consumer decisions are shaped by behavioural economic drivers. In other words, the irrational causes of consumer decisions identified by behavioural economics are: present-biased positive (time) preference, excessive optimism, excessive self-confidence, information asymmetry and information processing shortcomings. The increasingly severe problem that emerges from this calls for an examination of the optimal potential solutions. Among the potential solutions, regulation is the one we consider most effective.

4. Emergence and escalation of the issue

Understanding the issue and the regulatory solution to it calls for an overview of the main features of foreign currency lending that emerged in Hungary and of the situation that preceded the introduction of the 2015 regulation which ultimately led to the adoption of the regulation.

"As a result of the excessive race for growth, the Hungarian banking system mobilised significant external funding, primarily through parent banks. The Hungarian banking system consequently became very reliant on short-term foreign currency liabilities even by international standards, the loan-to-deposit ratio spiked even by regional standards and departed from the 100% figure considered sound. This is how cheap external funding increased risk-taking and fuelled procyclical lending." (*Bethlendi 2015:21*)

In the context of foreign currency lending, a financial institution disburses the loan in the currency of its own country[1] and the debtor repays both the principal and interest to the bank in this same currency, but the loan amount is kept on record in a foreign currency, or is disbursed in a foreign currency (the disbursement currency

[1] I.e. where the branch office is located.

is the foreign currency) but is repaid in forint (the repayment currency is forint). Conversion is performed at the interest rate valid at the time of disbursement and repayment, as defined in the contract.

There were several fundamental issues with foreign currency lending, as loans were disbursed and repaid in forint but the loan was kept on record in a foreign currency, so the consumer in fact assumed the entire exchange rate risk. "Consumers who took out foreign currency loans assumed any potential exchange rate gain or loss. They obtained a right and an obligation on the foreign currency market, even if this was not their intention. Every forint by which the Swiss franc appreciated was their gain and every depreciation of the forint their loss. The latter could have been avoided with some sort of exchange rate insurance, but they did not buy foreign currency purchase rights or currency futures. If they had done the latter, they would precisely have lost the interest rate difference" (*Száz 2015:82*). In the majority of cases, this occurred for the long term; needless to say, it is impossible to model the exchange rate of currency pairs for this time horizon, in other words, foreign currency lending was in fact a product that could not be measured and as such, was extremely high risk.

The rational consumer expectation of Hungary joining the euro area and the adaptive exchange rate expectation that understandably developed in the population in the wake of the stable forint exchange rate when viewed from the time of contracting the loan, before the crisis, may have contributed to a portion of this borrowing (*Kolozsi – Banai – Vonnák 2015*). Oftentimes, customers who were not creditworthy for forint loans became creditworthy for lower-interest foreign currency loans, ignoring the exchange rate risk (*Bánfi 2013*). "A significant portion of Hungarian households contracting foreign currency loans was (would have been) uncreditworthy in the domestic currency, which is why they were not granted forint loans. Add to this the fact that there is of course no long-term banking solution that can make an uncreditworthy customer creditworthy, especially not by changing the currency of the loan" (*Lentner 2015:311*). Foreign currency lending spread because it could be accessed with lower repayment instalments compared to forint loans, but was also associated with an unmeasurable risk for the consumer as described above, which consumers most likely ignored, were unaware of and were incapable of understanding the root of the risk. This despite the fact that "contrary to households, the banking sector has a far bigger toolset for managing risks stemming from retail foreign currency loans" (*Kolozsi – Banai – Vonnák 2015:61*).

Unfortunately, no better example than foreign currency lending could be found to illustrate the behavioural economic issues, biased intertemporal decisions and undervaluation and overvaluation addressed in the previous section.

5. The Fair Bank Act

Act LXXVIII of 2014 on the amendment of Act CLXII of 2009 on Loans to Consumers and certain related acts (hereinafter: Fair Bank Act) created what was known as the fair banking system, which introduced transparent and understandable developments in consumer loan contract interest rates. The relevant stipulations defined in the statutes came into effect on 1 February 2015. "Legislators have extended the tasks of central banks worldwide. Central bank decision-makers themselves have reassessed the economic role of their institutions. In light of these changes, the economic responsibility of central banks can be interpreted as an obligation for central banks to be more attuned to the social impacts of economic processes." (*Lentner – Szegedi – Tatay 2015:39*)

According to the data of the Magyar Nemzeti Bank, "the volume of consumer loans peaked on 30 June 2010, representing an aggregate value in excess of HUF 8,647.9 billion. This figure then decreased continuously until 2014, but the volume of consumer loans still exceeded HUF 6,802 billion on 30 June 2014. Of this amount, forint consumer loans account for HUF 3,139.1 billion and foreign currency loans account for HUF 3,662.9 billion. Based on the foregoing, the legislator drafted a bill for the amendment of the Fair Bank Act in an effort to increase the level of consumer protection in the context of loan contract law."[2]

5.1. The main amendments

Act LXXVIII of 2014 on the amendment of Act CLXII of 2009 on Loans to Consumers and certain related acts addresses the following main issues:

5.1.1. Enhancing the efficiency of the information obligation before contract conclusion

The rational consumer framework not only means correctly interpreting information, but also requires having sufficient information for drawing correct conclusions (*Barberis – Thaler 2003*).

It is therefore paramount that customers be given accurate and sufficient information prior to concluding a loan contract. It is even a necessary condition that the contract text be disclosed earlier. The Nobel prize-winning work of *Daniel Kahneman and Amos Tversky* (*1974*) showed that in complex and risky decision situations, consumers often simplify the issue and make decisions based on earlier partial information, their subjective feelings, prejudices and rules of thumb instead of rational analysis.

[2] Statutory reasoning: Act LXXVIII of 2014 on the amendment of Act CLXII of 2009 on Loans to Consumers and certain related acts.

Thus, in order to allow consumers to make more effective and rational decisions, the act states that the creditor and the lending intermediary are required to provide information to consumers prior to contract conclusion. The should enable the consumer to assess whether the prospective loan is a good fit for his needs and financial ability. For instance, the publication online of loan contract templates by creditors is aimed at helping prospective borrowers make an informed decision.

This provision was badly needed because although there had been prior regulation against misleading consumers, the new regulation not only restricted misinformation but also addressed the conscious exploitation of the decision-making flaws and non-rational preferences of prospective borrowers.

5.1.2. Other regulations

The debt cap regulation came into effect on 1 January 2015 based on two main pillars. "The payment-to-income ratio (PTI) will limit the maximum initial debt-servicing burden as a percentage of customers' regular legal income, thereby moderating the accumulation of household debt. The loan-to-value ratio (LTV) will cap the maximum amount of secured household lending (e.g. mortgage loans) as a percentage of the value of collateral."[3]

For instance, the payment-to-income ratio can be calculated as follows:

Payment-to-income ratio = monthly debt service/certified net monthly income

This may clearly foster a reduction of the shadow economy, as borrowing in the future will only be possible taking into account declared legal income. In addition, short-term profitability may override long-term profitability on the creditor side in lending practice. In this scenario, competition emerges for the largest market share, which can be achieved amongst others by reaching increasingly risky borrowers. Internal bank debt cap rules may be loosened during this effort, which may warrant an externally defined debt cap that halts risk-increasing competition. Therefore, systemic regulation aimed at restricting excessive borrower indebtedness is capable of mitigating the emergence of systemic risks.

5.1.3. Annual percentage rate cap

The "Loan contract terms and changes therein" subheading of Act LXXVIII of 2014 on the amendment of Act CLXII of 2009 on consumer credit and certain related acts was supplemented with the following passage: "The creditor (…) cannot extend credit to consumers with an annual percentage rate that exceeds the central bank base rate increased by 24 percentage points. In the case of credit card contracts, payment account credits, or pledged collateral credits, the annual percentage rate

[3] The payment-to-income ratio limitation acts as a debt cap to protect consumers. Magyar Nemzeti Bank press release, 27 August 2014.

may not exceed the central bank base rate increased by 39 percentage points." Borrowers often fail to rationally assess their future repayment capacity. The annual percentage rate cap is necessary if a portion of consumers overestimate their future income and would accept irrational credit fees given their current situation due to the behavioural asymmetries presented in the previous chapters. *Fischhoff – Slovic – Lichtenstein* (*1977*) confirmed this excessive self-confidence, concluding that consumer expectations in which they feel fully confident only materialise with an 80 per cent likelihood in reality. From the perspective of our topic, the excessive optimism linked to future increases in income prevailing in behavioural finance may lead to excessive indebtedness if the consumer takes on debt that is too high in reality.

6. Conclusions

The legislative intervention that aims to disrupt the basic principle of contractual freedom in the realm of private law in exceptional cases may offer a solution to the asymmetries presented in the models describing present-biased preferences. In such scenarios, the consumer has a high likelihood of finding himself in a situation where the contractual balance shifts to his detriment due to the inconsistent time preference, excessive self-confidence and optimistic estimates of the future. Although the reasoning of the regulation and the guiding legal practice primarily cite information asymmetry, it can legitimately be assumed that the identified causes can in and of themselves lead to contractual inequality. Our view is that the information asymmetry between the contracting parties further undermines the consumer's contractual position and the adequate information, professional know-how and experience cannot unequivocally neutralise a decision triggered by a biased time preference, as the latter is primarily psychologically-based and significantly decreases the likelihood of a more rational decision based on objective information.

For the sake of comprehensiveness, it should also be added that if banks offer products to retail customers that specifically take advantage of this present-biased time preference, it may further deteriorate the contractual balance. In our view, the present-biased time preference can even be regarded in and of itself as a circumstance that warrants legislative intervention in contractual freedom. We believe that the legislator offered adequate responses to the issues identified in the realm of behavioural economics, particularly the avoidance and prevention of intertemporal biased decision situations, the eradication of self-control issues, the management of information asymmetry, overreactions and consumer impatience. The statutory limitation of the rights of financial institutions in the interest of consumers (information obligation, the guaranteeing of broader contractual rights), the protection of consumers from themselves (debt cap regulations), the reduction

of information asymmetry (enhanced information obligation, the introduction of interest and interest margin indicators, the preliminary definition of the interest methodology of loans) are all steps that are geared towards reducing or remedying flawed (irrational) consumer decisions made as a result of the anomalies identified by behavioural economics.

In order to effectively address the identified issues, however, in addition to successful regulation, smoothly functioning supervision is also necessary to enforce the statutory requirements adopted in the interest of consumers. Significant trend-like changes have recently emerged in this domain. The fair bank legislative package, as it is commonly referred to, introduces a new regulatory framework that may be capable of managing the biased intertemporal decisions, consumer self-control issues and underreactions and overreactions that reflect consumer irrationality. The legislator recognised the social need that stems from the underlying inequalities and information asymmetry residing in consumer decisions. However, it is uncertain to what extent the legislator intends to intervene in the private law relationships of parties from a regulatory perspective. Too little intervention is incapable of curbing the potential adverse consequences of inequality between parties, while too much intervention could change the behaviour of economic agents to such an extent that it could distort market competition and excessively and unwarrantedly restrict economic development. But even well-crafted regulation and the effective enforcement of the law are unable to fully address the issue because as we have seen, the underlying factors of flawed irrational decisions are behavioural in nature, in other words consumer behaviour needs to be changed, or more specifically its motives and drivers. This underlying motivation and mentality can be shaped not with legal tools, but with education, training and information. Consequently, education and training tools must be adopted alongside the legal toolset, and only their concurrent application can yield a truly effective and comprehensive solution.

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