

Behavioural Finance: Providing a Helping Hand in Understanding Individuals Financial Behavioural

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Abstract Behavioural economics currently addresses the human insights that are missing from classic economic theory such as: heuristics, framing and market inefficiencies. As people are prone to economic decision-making errors it is imperative to pay attention and to examine cognitive, emotional and subjective factors that can influence the decision-making process. An area related to behavioural economics is that of behavioural finance which attempts to explain the set of psychological aspects and biases that affects financial decisions. The current research explores the influence context effects have on the economic decision making process in two different situations: crisis and no-crisis. A context effect is an aspect of cognitive psychology that describes the influence of environmental factors on one's perception of a stimulus and can have an important impact on our decisions. The paper finds that once the crisis has occurred, Romanians were influenced by the negative economic context, so a context effect could be observed. The financial decisions as regard to loans and deposits were also influenced by the interest rate level and earnings

Key words Behavioural finance, context effect, decision-making process, framing, borrowing, savings, economic crisis, interest rate, earnings

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1. Introduction

As rather the new kid on the block behavioural economics tries to explain why sometimes people make not so rational decisions.

Psychological factors, such as overconfidence, exaggerated optimism, emotions, intuition, how we perceive the present and the future, etc. influence the financial decision-making process. These influences and effects are studied and investigated by behavioural economics in order to generate conclusions about the implication of human psychology and social sciences in making financial decisions. In addition to research on decision making, renowned economists are interested in research findings supported by evidence and in obtaining experimental results. The inclusion of psychological factors in the field of economic research has open new research perspectives for economists. An increasing array of methods and tools provide a helping hand to behavioural economists in order to create and perform behavioural experiments, that provide additional support to the importance of subjectivity (as opposed to rationality) and the role played by psychology in decision making.

Predictably irrational behaviour is hard to pin down. Stepping in is behavioural economics, which was able to explain market irregularities that classic economic theory failed to explain.

Still it is useful to bear in mind that the different ways people depart rationality hardly can fit together in a simple theory. Reliable data can often provide a key to this issue. And what better setting can it be for testing a context effect, then an actual experiment with the framework provided by the crisis period vs. non-crisis period.

2. Literature review

In recent years three Nobel prizes in economics were awarded to behavior economists namely Thaler (2017), Schiller (2006) Kahneman (2002) therefore acknowledging the importance human behavior plays in economic decisions.

As pointed out by 2017 Nobel prize laureate Richard Thaler “in order to do good economics you have to keep in mind that people are human”. Humans act and behave different; they are a sum of traits whose behavior cannot be easily explained or predicted by a standard economic model. Humans are both emotional and rational. Moreover they are influenced by the economic and social context in which they live. Therefore all these aspects should be considered in the decision making process as the resulting decisions are not always well-thought-out and rational, they are sometimes taken in the spur of the moment.

To sum up behavior economics focuses on three areas: biases, heuristics and context effects.

Richard Thaler came up with the notion of mental accounting through which it can be explained how people mentally divide their income into categories with specific purposes leading to irrational allocation of resources. This concept constituted the basis of further research that showed that people preferred keeping savings for which they received a lower interest meanwhile running debts at higher interest rates or how individuals spend less when paying via cash than they do when they pay via credit/debit cards.

When it comes to heuristics it can be said that humans are creatures of comfort and when trying to make sense of things they rely on short cuts that can lead them astray. Tversky and Kahneman (1974) were able to identify three important heuristics namely: anchoring, availability and representativeness which basically explain how our behavior and decisions are influenced by irrelevant correlations, easily remembered events and stereo-types.

Humans are comfort creatures that enjoy little the changes. The status quo bias which is a preference for the current setting implies that most of us humans love familiarity and are risk adverse. Kahneman (1991) pointed out that humans perceive losses twice as severely as they do when it comes to gains. One of the theories of behavioural economics that has a particular impact on market research and on how we can take steps to alleviate how much they affect market research is the Framing and Context Effects theory. There are a number of findings in the behavioural economics literature demonstrating how various aspects of the decision context can significantly influence the financial decision.

Kahneman and Tversky pointed out in Prospect Theory that the context and the architecture of things in which different choices are set forth influence individuals options of the aforementioned choices. Highlighting either the pros or cons aspects of the decision can change its attractiveness. These are the so called framing and context effects. Basically the way one puts forward certain questions, questioners can severely influence the respondents’ options and judgment therefore making wording and framing highly important.

3. Methodology of research

To find out whether the economic crisis has had a significant impact on the total volume of loans and the total volume of deposits statistical regression will be used as a method of analysis. The total volume of loans/deposits during the two economic contexts (crisis and non-crisis) will be used in order to create a meaningful analysis and to generate certain credible conclusions regarding the financial behaviour of the individuals in the two different economic contexts (crisis and non-crisis). Basically, the context is external and already given: the economic crisis that led to a very strong impact on several indicators (variables).

The aim of the research is to provide answers to the followings questions:

- 1) *Can an economic context influence individual financial choices? Or the impact on the volume variation was pure random?*
- 2) *How important is the role played by earnings and interest rate in the individuals choices regarding saving/borrowing?*

To find out if the economic crisis has had a significant impact on the total volume of loans and the total amount of deposits the statistical method ANOVA was used. This provided an answer to the question: Did the economic crisis impact the volume of loans/deposits taken or their variation was pure random?

The method employed (Analysis of variance); ANOVA is one of the most relevant statistical tools for survey data. The problem to be solved is reduced to the comparison of samples means of loans/deposits in the crisis versus non-crisis period, which show whether the variation was random or related to the economic context, respectively whether the crisis has had an impact.

The crisis period is defined as: December 2007 to June 2009 and the non-crisis period as: July 2009 to December 2014. This type of analysis involves, initially defining variables stating a null hypothesis (usually assumed true) and an alternative hypothesis.

The data set consist of the total loans/deposits volumes both in the crisis and non-crisis period. The crisis variable is a binary variable (dummy variable). This variable can take only two values, 1 if the event has taken place and 0 if the event had not taken place.

The assumptions:

In this case null hypothesis is H_0 : crisis has no impact, meaning that the variation of the dependent variable the volume of deposits/loans is random (loans and deposits have the same mean in both periods); the alternative hypothesis H_1 : crisis has had an impact on the dependent variable, loans/deposits have different mean value in the two periods. The calculated values (from the sample) of F statistic are checked against its critical values to see if the null hypothesis is rejected or if we fail to reject it;

If $F > F_{critic}$ than the null hypothesis is rejected (no impact of crisis is rejected) meaning crisis has had an impact;

If $F < F_{critic}$ the null is accepted, the differences are due to random sampling variation.

Table 1. Credits

Anova: Single Factor SUMMARY						
Groups	Count	Sum	Average	Variance		
Crisis value	17	1581197838	93011638	7,589E+13		
Non-crisis value	71	7058959376	99421963	1,2451E+14		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	5,64E+14	1	5,64E+14	4,88124587	0,029808	3,951882
Within Groups	9,93E+15	86	1,15E+14			
Total	1,05E+16	87				

Table 2. Deposits

Anova: Single Factor SUMMARY						
Groups	Count	Sum	Average	Variance		
Crisis value	18	1,44E+09	79985340	5,63E+13		
Non-crisis value	76	8,05E+09	1,06E+08	5,99E+14		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9,82765E+15	1	9,83E+15	19,69177	2,52E-05	3,944539
Within Groups	4,59148E+16	92	4,99E+14			
Total	5,57424E+16	93				

It can be seen that the crisis has had an impact on the evolution of loans and deposits.

In order to provide an answer to the second question regression analysis will be employed.

Using the ordinary least squares method of estimation, the influence of each independent variable on the choices of consumption/saving will be determined.

The assumptions are that loans/deposits are influenced by:

1) Net average earnings in the sense that a higher wage(income), on one hand will determine repayment on old loans and on the other hand will encourage contacting new loans;

2) The interest rate for new loans-will either deter or favour contracting new loans;

Therefore, these variables alongside the binary variable crisis will be used as explanatory variables in the model.

The model employed is the following:

$$\text{Loans/Deposits} = \beta_0 + \beta_1 \text{crisis} + \beta_2 \text{avgsalary} + \beta_3 \text{interestrates} + \zeta \quad (1)$$

The dependent variable of the model is the volume of loans/deposits and the independent variables are: average salary, interest rate and the dummy variable crisis (that takes the value zero meaning that the crisis did not happened or the value one meaning that the crisis has happened).

Running the regression, the following results were obtained:

For deposits:

$$\ln Y(\text{totaldepos}) = 5.75b_0 - 0.095\text{crisis}(\text{dummy}) + 1.76\ln_avgsalary + 0.027\ln_interestratenewdepos$$

Table 3. Regression statistics

Regression Statistics								
Multiple R	0.977938355							
R Square	0.956363426							
Adjusted R Square	0.954940495							
Standard Error	0.058913144							
Observations	96							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.753194249	0.329135261	17.4797262	5.46163E-31	5.099503225	6.406885	5.099503	6.406885
crisis	-0.095708519	0.019823425	-4.82805167	5.46654E-06	-0.13507955	-0.05634	-0.13508	-0.05634
LN_avgsalary	1.756135377	0.048793408	35.99124218	5.33137E-56	1.659227458	1.853043	1.659227	1.853043
ln_interest_rate	0.027669415	0.018194475	1.520759148	0.131749878	-0.008466383	0.063805	-0.00847	0.063805

For credits:

$$\ln Y(\text{totalloans}) = 12.31b_0 - 0.08\text{crisis}(\text{dummy}) + 0.91\ln_avgsalary + 0.24\ln_interestratenewcredits$$

Table 4. Regression statistics for credits

Regression Statistics								
Multiple R	0.853619							
R Square	0.728666							
Adjusted R Square	0.718858							
Standard Error	0.053041							
Observations	87							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	12.31573	0.507471996	24.26878758	1.89E-39	11.30639	13.32507	11.30639	13.32507
crisis	-0.08727	0.018590437	-4.69414701	1.04E-05	-0.12424	-0.05029	-0.12424	-0.05029
LN_avgsalary	0.910807	0.073671982	12.36300511	1.62E-20	0.764276	1.057338	0.764276	1.057338
ln_interest_rate	0.243061	0.030913087	7.862732726	1.22E-11	0.181576	0.304546	0.181576	0.304546

R² represents the goodness of fit of the model; basically R² is a statistical measure of how close the data is to the fitted regression line. It shows the percentage of explained variation out of total variation. In this case it shows how much of the variation in loans/deposits can be explained by the independent variables. In the two regression models R² takes the value 0, 95 for deposit dependent variable and the value 0, 72 for loans as dependant variable. Therefore it can be inferred that the independent variables leave a high exploratory power in the lending/saving decisions undertaken by the households.

Both t-stat and p-value show if the variables used are statistical significant. For low p-values (p ≤ 0,05 → 95% confidence interval) it can be inferred that there is a relationship between the independent variable and the dependent one and that the independent ones can be used to try to explain the variation in the dependent variable (their relationship is not likely to be the result of chance). This is the cause for all our independent variables in both regression models.

4. Results

4.1. Interpretation of independent variables

Earnings (Salary)

For a 1% increase in earnings it is expected that the volume of loans to increase by 0.91%; or for a 10% increase in earnings, it is expected that the volume of loans to increase by 0.91*10=9.1%

For a 1% increase in earnings it is expected that the volume of deposits to increase by 1.76%; or for a 10% increase in earnings, it is expected that the volume of deposits to increase by $1.76 \times 10 = 17.6\%$

As regard to earnings the increase in the average salary lead to an increase in both deposits and credits; as people earn more they are more likely to both spend and save more.

The interest rate

For a 1% increase in interest rates we expect the volume of loans to increase by 0.24%; or for an increase of 10% interest rate we expect the volume of loans to grow by $0.24 \times 10 = 2.4\%$.

This impact is interesting; theoretically it is expected that as interest increases the volume of loans to fall; but here the population did not behave so rational. A significant number of people do not to know exactly how much they pay when it comes to fees, interest or how many items will change during the maturation of the banking product. Another explanation is that job losses under the influence of an unstable economic environment, has produced the following effect: a part of the population had lost their jobs or had their income reduced so they were forced to continue to borrow at a higher cost to be able to pay other existing liabilities (refinancing constraints) or for basic living necessities.

For a 1% increase in interest rates we expect the volume of deposits to increase by 0.27%; or for an increase of 10% interest rate we expect the volume of loans to grow by $0.27 \times 10 = 2.7\%$.

This impact is to be expected; higher interest rates increase the propensity to save for individuals as they get a better return for their money.

Economic crisis

If we move from non-crisis to crisis the crisis impact on the volume percentage of the loans is $100 \times (\exp(-0.08727) - 1) = -8.36\%$.

Or perfectly correct, the estimated values: $100 [\exp(-c^* - 1/2v^*(c^*)) - 1]$; where $v^*(c^*)$ is the estimate of variant c^* -ie, the square of the standard error= $100 (\exp(-0.08727 - 1/2 * (0.018590437)^2) - 1) = -8.37\%$.

If we move from crisis to non-crisis; crisis impact on the volume percentage of the deposits is $100 \times [\exp(-0.095708) - 1] = -9.12\%$.

Or perfectly correct the estimated values: $100 [\exp(-c^* - 1/2v^*(c^*)) - 1]$, where $v^*(c^*)$ is the estimation variance c^* - i.e. the standard error square $c^* = 100 [(\exp(-0.095708 - 1/2 * (0.019823425)^2) - 1)] = -9.14\%$.

Basically, the difference in the volume of deposits and loans between the crisis and non-crisis period can be observed as this qualitative variable shows how different the crisis period is from the base group of non-crisis period. Therefore, it can be stated that this shows the impact of the crisis. Other things being equal the volume of both loans and deposits was reduced in the crisis period.

So, the phenomenon of economic crisis by inducing insecurity for the future determined people to take fewer loans. Also, the individuals were not able to save more probably due to income decrease and increase in livelihood spending.

5. Conclusions

In the ANOVA analysis, F statistic tests show joint significance of the independent variables. As it can be seen $F > F_{critic}$ in both the deposits and loans in the analysis, therefore we can reject the null hypothesis that loans and deposits have the same average in both periods (crisis and non-crisis). It is concluded that indeed the economic crisis has had a significant impact on the evolution of two variables leading to different behaviours in the two contexts.

The analysis based on regression between the loans/deposits to households and the relevant macroeconomic variables: salary income, interest rate and economic crisis, it is found that the greatest impact on the dependent variable, it is given by earnings and the phenomenon of crisis which had a rather significant negative impact. As regard to interest rates their increase lead to an increase in both deposits and counter intuitively to an increase in loans. This can be explained by refinancing constraints therefore the context induced a different behaviour for individuals.

The economic crisis, the job loss perspective, the interest rate evolution and the negative impact on the standard of living may cause many to be extremely cautious in borrowing because of fear that they can

no repay the loan; moreover, it can be that individuals are not able to save as much as in non-crisis periods due to different constraints. Therefore, it can be stated that fear and uncertainty induced by a negative economic context can have an impact on individual choices as regard to saving and borrowing.

Borrowing and saving decisions are complex, based on a series of plans, motivations, beliefs about the future, but the decisions are influenced by the context and are prone to a dose of overconfidence and other forms of irrationality, therefore, choices do not always materialize into something profitable.

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