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THE INFLUENCE OF FRAMING EFFECTS ON THE BORROWER'S RISK PERCEPTION DURING A MORTGAGE DECISION

Rafaela Drumond Barbosa

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Ana Isabel de Sá

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Abstract

This research explored framing effects to understand the relation between how the information is carried to the borrower and the assumption of risk in mortgage decisions. In particular, the study explored if how and where the information is presented influenced the borrower judgment about choosing an adjustable or fixed rate mortgage loan. Starting from the European Standardized Information Sheet (ESIS) provided in any mortgage application, I applied an empirical methodology based on a survey to analyse the presence of *content* and *position* effects, consonant with the possible ways the information about interest rates can be presented in the ESIS. The objective was to verify if these manipulations in the information can affect the judgment of borrowers. The survey results showed that there was a significant difference in choices of similar individuals in different questionnaires frame, and that their preferences could be reversed according to the framing presented.

JEL-codes: C92, G01, G21, G41
Key-words: Household finance, Mortgage, Framing effects

Resumo

Esta pesquisa explorou o efeito framing para entender a relação entre como a informação é levada ao tomador de crédito e a assunção de risco na sua decisão de hipoteca. Em particular, o estudo explorou como e onde as informações são apresentadas influenciaram o julgamento do tomador de crédito sobre a escolha de um empréstimo hipotecário com taxa ajustável ou fixa. A partir da Ficha de Informação Normalizada Europeia (FINE) disponibilizada em qualquer aplicação hipotecária, apliquei uma metodologia empírica baseada num inquérito para analisar a presença de efeitos de conteúdo e posição, consoante as possíveis formas de apresentação das informações sobre taxas de juro na FINE. O objetivo foi verificar se essas manipulações nas informações podem afetar o julgamento dos tomadores de crédito. Os resultados da pesquisa mostraram que houve uma diferença significativa nas escolhas de indivíduos semelhantes em diferentes enquadramentos dos questionários, e que suas preferências puderam ser revertidas de acordo com o enquadramento apresentado.

Códigos-JEL: C92, G01, G21, G41

Palavras-chave: Finanças domésticas, hipotecas, framing effects

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Chapter 1. Introduction

This work is an empirical study that uses concepts of behavioural economics to understand whether manipulations in information impacts borrowers' perception about mortgage risks. The research was based on the theory of the Framing Effects, a concept proposed in the Prospective Theory, that addresses the possibility of influencing an individual response to a problem by only changing the way it is presented (Kahneman & Tversky, 1979).

To capture framing effects on the context of new mortgage loans, I applied a survey to test the impact that an information manipulation could have on borrowers' perception about risk, and consecutively, their choice of interest rate type associated to the mortgage contract. The information manipulation could have been done according to different perspectives, but for this study I focused on two: changing how the content is presented and changing where it is presented in the text.

These two types of manipulation are included in the concept of framing effects, as they are subtle changes on the way the information is presented. However, a distinction was made between them to make the analysis clearer. Therefore, the impact of how the content is presented was called *content effect* and the effect of where the information is presented was called *position effect*, for the intention of this research.

The mortgage market was chosen to evaluate these effects because the actual scenario of prevalent low interest rate can lead to risk-taking behaviour by borrowers (Zurbrügg, 2021), so they can choose a mortgage that they might not be able to afford in a scenario of an interest rate increase. For some years, the European Central Bank (ECB) has a concern regarding the sustainability of mortgage loans for households that have chosen adjustable-rate mortgages (ARM) (Official Journal, 2014).

If that is the case, an interest rate increase could lead to instalment changes for borrowers such that it would result in payment failure. In Swiss, for example, it was noticed that between 20% and 30% of recently granted loans could not be affordable if the interest rate raised to 3% (Zurbrügg, 2021). Having this in mind, it is important that borrowers are well informed about their contract terms and risks.

The European Parliament tried to reduce information asymmetry on the mortgage market by issuing a Directive with the purpose of including in only one document, all the information the credit taker must know before signing a mortgage contract. This Directive

created the European Standardized Information Sheet (ESIS)[1], as a transparency tool to help to decrease the risk-taking behaviour.

The ESIS contains relevant information about the mortgage contract, for example, the type of the interest rate - fixed (FRM) or adjustable (ARM) - the values of the instalments and so forth. This gives the borrower a better overview about their mortgage terms and the risks associated with it.

One of the features of ESIS is the repayment table, derived from the section 7 of the Directive, that informs how much the borrower will have to pay during the period of the loan, considering simulations of values that the interest rate can assume, including the highest value of index in the last 20 years (Official Journal, 2014). However, the ESIS is an extensive document, and the repayment table is presented in the end of the document, even though it addresses some relevant information for the evaluation of the loan.

The Directive explicitly informs its purpose of making the internal market more transparent, efficient, and sustainable while providing financial inclusion and borrowers protection (Official Journal, 2014). So, this research intends to check if, the way this information is presented on the ESIS influences the behaviour of these households, i.e., if their preferences on interest rate could be changed based on information manipulation (frame).

By linking the Directive´s goals to the economic theory, the main question of this research is: Considering the relevance of the information about interest rate and instalments (current and possible), does it influence the borrower's judgement about the mortgage choice and their choice of interest rate, if those pieces of information were presented in a different way?

The purpose of the research is to identify if a borrower perception about the risk associated with a mortgage contract can be affected by how (*content*) and where (*position*) the information about current and possible interest rate or instalments is presented in this contract. The objective of this research is to observe, by the optics of the framing effects, if households' perception is consonant with the risk of an interest rate increase and the impact it would have in their capacity of keeping the loan.

The motivation for this research is the necessity to better understand the household behaviour during the weighty decision of purchasing a house. Also, this analysis contributes

[1] Issued by the European Parliament and the Council in 2014, the Directive 2014/17/EU created the European Standardized Information Sheet (ESIS).

to a better assessment of ESIS and its goals, by understanding if this tool corroborates to make the contract more transparent, with its current format.

To answer the research question, I used a survey that contains questionnaires with information set in different frames. This survey was formulated to reproduce, in a simplified way, the decision of choosing a mortgage loan. The respondents of this survey were workers from University of Porto (teaching and non-teaching staff), through a form that was sent by e-mail.

After the analysis of the survey results, it was possible to verify the influence of *content* and *position* in borrowers' decision. This result was also a theoretical exercise about how much this information is promoting a beneficial impact on the internal market, following the Directive establishment.

This study contributes to two areas of research: mortgage market and behavioural economics. On the mortgage market side, it provides a better understanding about the influence of information provision on the household behaviour. At the same time, it establishes an overview about the efficiency of the content of ESIS, as a tool to reduce information asymmetry. On the behavioural economics side, the empirical research is the main tool to understand how people act in specific circumstances, so it was a useful application of the framing effects theory.

The content of next sections occurs as follow: chapter 2 provides the literature review about behavioural economics, then, about mortgage market. Chapter 3 addresses the methodology of the research. Chapter 4 presents the results, and, in the end, chapter 5 presents the conclusion.

Chapter 2. Literature review

This chapter was divided into three subsections of literature review: behavioural economics, mortgage, and the literature that relates these two topics.

2.1 Behavioral Economics

2.1.1 Prospect theory

The Prospect Theory (PT) addresses how people make decisions, independently of being motivated by a rational behaviour or not. This theory is considered a dominant alternative for Expected Utility Theory (EUT) (Abellan-Perpinan et al., 2009).

On one hand, the EUT states that a person behaves according to their expected utility (Abdellaoui et al., 2008). This builds the idea that individuals are rational and before making a choice, they consider all aspects of a decision, and its probable outcomes. It also states that people would always make the same decision in identical contexts of choice (Blavatskyy, 2007).

According to EUT, a person maximizes utility at a decreasing rate, meaning that marginal utility of an additional unit is always smaller than the previous one (Varian, 2014). This can be displayed graphically in a concave curve (Bernoulli, 1954). In this theory, the risk attitudes are modelled through the point of view of the observer (Wakker & Zank, 2002) and follow stablished axioms that categorize the functioning of the expected utility theory (Von Neumann & Morgenstern, 1947), that are: completeness, transitivity, continuity, monotonicity, substitution and independence of irrelevant alternatives.

These axioms describe the expected behaviour of the households. However, it is proved that people often violate them, involuntarily. For that reason, the EUT was not fully capable to reflect people´s behaviour (Kalinowski, 2020).

According to the Prospect Theory, people overweight outcomes that are considered certain and discard common components of different alternatives. The function of this theory is graphically represented for a curve that is concave for gains and convex for losses, another aspect is that this curve is steeper for the losses, representing the loss aversion (Kahneman & Tversky, 1979). The process of a decision occurs in two parts: first a person simplifies and makes a restructuration of the problem in order to display the options (focusing on the aspects that differentiates them), then, she evaluates this edited alternative to make her decision (Tversky & Kahneman, 1985).

These stages make an individual susceptible to bias on their understanding, as this way of evaluation can lead to inconsistencies (Abdellaoui et al., 2008). In a further development of this theory, Tversky and Kahneman (1992) proposed the Cumulative Prospect Theory (CPT) and added other treatments for gains or losses, where they included the concept of weighting gains and losses. Thus, instead of evaluating them separately, it is observed in a cumulative way (Tversky & Kahneman, 1992).

Another important concept is the choice architecture. This addresses the context in which an information is presented and how to organize it in order to improve people's decision-making (Thaler & Sunstein, 2008). There are several ways of doing this, since caring about the content of the message or how this content is presented (Johnson et al., 2012).

A clever way of influence people is by using the Nudge. For it, it is necessary to make subtle changes in a context to influence people to go for a specific outcome, without forcing them to it (Thaler & Sunstein, 2008). Another instrument is the default of a choice, because when there is a default option, it tends to be more chosen as it is automatic (Madrian & Shea, 2001).

This is part of the limited rationality concept, that says that people do not act as the traditional economic theory proposed, that is by considering all the information available and potential outcomes before deciding, otherwise, they make simplifications in the way they think, therefore, their behaviour become less rational (Simon, 1957).

2.1.2 Framing Effect

The Framing Effect theory considers that a person's behaviour in a choice context depends on the information they receive. Also, how this information is presented influences the choice (Kahneman & Tversky, 1979). Framing is a way to put information in a context so the receiver of the message can evaluate it (Hallahan, 1999). Prior work that studied this phenomenon described that it could happen in three different ways, as result of the process where people structure a situation before deciding (Tversky & Kahneman, 1980).

One of them is the Framing of Contingency, that describes the influence of the certainty on the choice, by showing that a certain option could be an attractive choice but when the probability of occurrence associated to it decreases, this option becomes less attractive (Tversky & Kahneman, 1980).

Another one is the Framing of Acts, which is the most related to the risk aversion or risk seeking concepts, as it uses the certainty of winning or losing to infer probable

behaviours, where it was demonstrated that a person would prefer a sure gain to a bigger value gain with less probability of occurrence (Tversky & Kahneman, 1980).

The last one is the Framing of Outputs, which is the one used in this research. This type establishes that a person makes a decision by observing from a neutral point of view, and based on it, they perceive if an output would be a gain or a loss, which results in a risk averse or risk seeking behaviour (Tversky & Kahneman, 1980).

To prove this theory, Tversky & Kahneman (1980) made research, where they presented a problem to a group of respondents, then they presented again to another group, but framed the problem in a different way. Among them, there was the Asian disease problem:

> "Imagine that the U.S is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed." (Tversky & Kahneman, 1980, p. 3)

The groups had to choose between two alternatives: an option in which 200 (400) people would be saved (die) for sure, against another option, that said that there were 1/3 probability that 600 people would be saved (nobody would die) and 2/3 probability that no one would be saved (600 people would die) (Tversky & Kahneman, 1980).

By fact, these two approaches show the same information, as the values are complementary. But the way it was presented, in terms of "save" or "die" - the former represents a positive approach and the latter, a negative one - influenced the answers. This happens because the format influences a person perception of risk, as the framing effect proposes (Cheng et al., 2012).

In the research that used the Asian disease problem, 76% of the positive group adopted a risk-averse behaviour and chose for a sure (gain) saving of 200 people, on the other hand, when they had the information framed in negative terms, 87% opted for the second option, as a sure (loss) death of 400 people is considered less accepted, so they acted in a risk-seeking behaviour (Tversky & Kahneman, 1980).

It means that it is possible to change people's opinions by changing the frame in which a problem is structured, as it changes their point of view. This reveals the bias that households have when making decisions, something that they should not have, according to the normative theory of decision making (Yao et al., 2018).

Furthermore, when a message is not well transmitted, consumers can even formulate incorrect beliefs (Dobson & Poels, 2020), thus, the frame of a choice is an instrument to get to an outcome. A positive frame, for example, is more persuasive (Dobson & Poels, 2020). On the other hand, information framed in negative terms can raise risk seeking behaviour (Tversky & Kahneman, 1980). In fact, studies also show that the framing effect can occur when the problem is different coded, not only when it is different framed (Yao et al., 2018).

With further development of this theory, it was found that there were additional types of framing effects (Levin et al., 1998). One of them is the Risky Choice Framing, which is used in a context of choices with different levels of risk, presented negatively or positively, and it influences the outcome (Diacon & Hasseldine, 2007).

Another one was called Goal Framing, which involves the consequences of a behaviour, it means, to show either positive consequences of performing an attitude or negative consequences of not doing it, in a persuasive way (Levin et al., 1998). The third was the Attribute Frame, in which one attribute of the choice context is manipulated, then the respondent would analyse its level of attractiveness based on the probability of a successful or a failure outcome (Levin et al., 1998).

Some studies make a relationship between framing effect and real-life decisions situations. For example, research showed that households, in face of a decision about health plan, would prefer to change it, when the information about value is presented in absolute terms instead of a percentage (Schmitz & Ziebarth, 2017).

Another research showed the impact of the advertisement in the evaluation of a type of mortgage plans and found out that there is an impact on the decision when they changed the duration time of the loan or the applied interest rate (Dobson & Poels, 2020). The same idea was tested to show that when insurance aspects of a type of a loan are emphasized, people who would benefit more from it are more likely to choose it (Abraham et al., 2020).

These studies put the loan choice in a context of information manipulation, it means: to achieve predetermined objectives, the framework can be used to give a specific message that would conduct the borrower to a specific outcome. Therefore, the information can serve a purpose for the information provider (Diacon & Hasseldine, 2007), thus, framing is a valid instrument because households are able to identify different messages approaches (Dobson & Poels, 2020).

2.2. Mortgage

2.2.1 Mortgage market

The decision about purchasing a house is part of a market, with particularities that the average household may not understand. More than receiving credit for purchase a house, the household is part of a delicate system that involves banks, central banks and government as well.

Central banks and governments use instruments to achieve its policy outcomes. One of these instruments is the interest rate, which is mostly managed by Central Banks according to their mandate on monetary policy. As part of the financing sector, the mortgage market is also key to transmit the effects of the monetary policy to the real economy (Kouretas & Pawlowska, 2020).

It is known that changes in the official interest rate are more strongly felt when the mortgage market of a country is developed, and that policy can also lead to financial instability, whose level depends on the institutional factors of each country (Martins et al., 2021). For example, in countries where the mortgage sector is less conservative, the increase in house prices is sharper after financial crises (Martins et al., 2021) and these markets face longer house booms as well (Agnello et al., 2020).

In a precautionary conduct, some countries adopt macroprudential policies to reduce the risks on the financial sector. If these policies are properly implemented, they can have an important role as a stabilizer in case of a demand shock (Agnello et al., 2020). One type of macroprudential policy applied to the mortgage market is the ceilings on loan-to-value (LTV) ratios (Claessens et al., 2013), or, on loan to income (LTI). These policies are used in order to reduce the level of indebtedness that families may hold.

On the supply side, the interest rate that is used as reference to the mortgage transactions in Europe is the Euribor. To define this rate, the European Bank Federation (EBF) considers the interest rate verified in the European Interbank Market transactions by a selected group of banks (Rodriguez-Lopez et al., 2021) and calculates the average for different time horizons: a week, a month, and 3, 6 and 12 months. Banks can find incentives to expand the credit offer (Aikman et al., 2015), thus, the expansion of credit may increase the value of debt at the same time as it does not increase the real value of the assets (Jorda et al., 2016). Therefore, a crisis due to a debt growth is a point of concern, as people in Europe need to borrow more to purchase a house, in comparison to how much they needed to borrow in the past (Miles & Pillonca, 2008)

So instead of attenuate the pressure on the mortgage market by having more people borrowing, there is a pressure that is formed by the group of people that borrow a greater value for their loans (Van Gunten & Navot, 2018). As a symptom, borrowers use mechanisms that do not reflect a real increase on their financial capacity, such as extending the duration of the loan, to leverage their capacity to afford a loan (Van Gunten & Navot, 2018), and it makes the system more fragile as it generates more debt that could lead to recessions (Kohl, 2021).

For the mortgage market to function in a sustainable way, it must be supported by strong institutions and well-designed legal instruments (Martins et al., 2021). Thus, the macroeconomic policies must be complemented by countercyclical regulation to guarantee this stability (Korner, 2018), at the same time housing finance regulation can help to reduce house price fluctuations in this sector (Agnello et al., 2020).

2.2.2 Types of mortgages

Households face a decision regarding which type of loan they would sign for. They can decide for an Adjustable-rate Mortgage (ARM), where they have their instalments adjusting according to the interest rate that their contract is indexed to, or they can choose a Fixed-rate Mortgage (FRM), so the value that they will pay during all period of the loan is pre-determined. Alternatively, they can decide to have a mix modality, with a period of a fixed-rate and another of an adjustable-rate.[2].

Households may prefer ARM, because this type of mortgage generally has smaller initial payments, even though they are associated with more risks than FRM (Bucks & Pence, 2008). In fact, in Portugal, a major part of mortgage loans is ARM indexed to the Euribor rate (3, 6 or 12 months) and with an additional spread (Bank of Portugal, 2021). This means that the instalment changes accordingly to the changes in Euribor rate, which is a function of the reference interest rates set by the European Central Bank.

In the European Union, the reference interest rates are being held negative for a while, meaning that instalments are associated to historically low effective rates, even though the economic scenario have been changing due to political instabilities, which may affect household´s judgment about risk.

[2] In Portugal, some loans with these two modalities are called "fixed rate mortgages". However, for the purpose of this research, a loan is considered FRM if and only if the rate is fixed for the entire period.

Considering this, it is expected that the payment default in this type increases when the interest rate and inflation increase (Campbell & Cocco, 2015) and that is why there is a concern by the European Central Bank regarding the sustainability of these loans in a context where the Euribor increases in a near future.

2.2.3 Regulation of the information on contracts

A loan is a long-term commitment that is risky for both lenders and borrowers (Badarinza et al., 2014). Borrowers may find it costly to look for information (Bucks & Pence, 2008). So, increasing the accessibility of information received by the household about the commitment they are going to make, can be a useful tool for market stability.

Taking this in consideration, some policies can be implemented to reduce the lack of information that individuals may have. The idea of a regulation (or even counselling) reduces borrowers' propensity to choose risky mortgages (Ben-David et al., 2011), therefore, reducing vulnerability. The same outcome can be achieved by being sure that people receive the information about which loan will benefit them the most, before signing a contract.

Considering this possibility, the European Parliament made a directive to guarantee that there is an active effort to make the households more informed and protected against risks when purchasing a property (Official Journal, 2014). This directive was issued to address the new "credit agreements for consumers relating to residential immovable property" (EUR-Lex, 2017) regulation.

The Directive addressed the creation of the European Standardized Information Sheet (ESIS)[3], with a purpose to include in only one document, all the information the credit taker must know before signing a mortgage contract. Indeed, the asymmetry of information can be solved by this kind of tool, however, if it is made by giving a lot and complex information, it would not be enough to solve the irrationality problem (Júdice, 2018). [4]

Section 7 of the Directive includes the Illustrative Repayment Table, which resumes all instalments values that the mortgage can assume under the present interest rate, as well as, under the interest rate resulting from the highest value that the index assumed in the last 20 years (Official Journal, 2014).

[3] Full model of ESIS is presented in Annex 1.

[4] The Bank of Portugal made a partial transposition of this norm to the national regulation (Instruction nº 19/2017) where they define a model of how ESIS should be, both in simulation and approval of credit.

This type of comparison in standard documents helps the individual to better understand the given information (Loewenstein et al., 2014), as in this way the household can see the prospect of this loan during the life of the contract and judge if he will be able to afford it, according to each value that the instalment could assume.

However, the ESIS is an extensive document. The basic information regarding the value of the loan, the type and the maturity appear in the first three sections. In section 4 (interest rate and another costs), it informs the type of interest rate, as well as present, in lowercase letters, the information about the possibility of change on instalments, in the case of ARM. In section 5 it addresses the number of instalments.

In the sections 6 it addresses the value of the instalments, they also reinforce that the value to pay each month can vary. However, the repayment table, that presented the value of the instalments and how much would they reach if considered the highest value that index had in the last 20 years just appears in the part B (additional information), section 6.b.

Considering that households may find it hard to remember details of the content they receive (Bucks & Pence, 2008), the moment when it is presented a detailed information about the adjustable rate matters. If a person receives a lot of information to process, it is possible that she cannot even notice the second repayment table in the end of the ESIS, as the attention of this person may dissipate (Loewenstein et al., 2014).

On the opposite, a vague piece of information may not be enough to clarify as it can be difficult to understand. So, to the mortgage market to be seen as trustful, the information must be transmitted (Dobson & Poels, 2020) but, at the same time, the policy to provide information must be followed by an effort to make its content assertive and useful.

Behavioural economics can help to understand the borrowers' risk evaluation and validate the European Central Bank strategy to provide information to consumers, by understanding if it can be made in a more assertive way and help on sustainability of the mortgage market.

2.3 Households and mortgage decision

Purchasing a house is a big investment for households, therefore, they are supposed to observe the economic scenario and check their capacity to afford the loan, as well as look for information about it in diverse sources (Dobson & Poels, 2020).

Even though it is showed that households are vulnerable in terms of information, borrowers are confident about their knowledge of their mortgages (Bucks & Pence, 2008).

Households consider the expected cost and risks of changes in the interest rates during the period of the loan, however, they do not realize the impact of an eventual change in the interest rate in the long-term could have in their loans (Badarinza et al., 2014).

This is especially relevant for borrowers that choose ARMs (Bucks & Pence, 2008), because they may be subject to unexpected changes in instalments, which would lead to possible defaults on payments. Research shows that it may be possible for households to underestimate the cost of interest rate and fail to estimate the impact of a change (Stango & Zinman, 2011).

Even though there is in fact some evidence of rationality in the households' previsions for the future of interest rates (Badarinza et al., 2014), this failure still happens because it is a decision for the long run, and as distant it is, as it is difficult to pay attention to outcome details (Trope & Liberman, 2010).

Furthermore, there are a lot of possible influences on households behaviour in this context, for example, emotional factors can distract from a mortgage characteristics (Dobson & Poels, 2020). The lack of financial knowledge also make borrowers to choose for expensive methods of payment for either not knowing well their terms or for being influence by biases (Lusardi & Tufano, 2015).

This kind of irrationality also leads people to act more confident in some investments they made (Shiller, 2015). For example, they can find it difficult to make decisions about long-term savings (Diacon & Hasseldine, 2007), as well as can follow tendencies just because other people are following, this way, it can result in an unstable economic scenario and, in the worst case, in a bubble (Shiller, 2015).

There is also influence of finance literacy on this behaviour, as individuals who have less knowledge about their debts are more susceptible to taking greater risks (Lusardi & Tufano, 2015). However, research shows that the consumer level of information is not only related to the level of education, but also with as age, that can influence how much debt a person will choose to hold (Gathergood & Weber, 2017), as well as family conditions or the location where he lives (Angelini et al., 2013).

There is also evidence that the level of income can influence decisions, as households with higher income are more aware about their mortgage terms (Bucks & Pence, 2008), this is also supported by other studies, that show that wealthier and well educated households tend to make less investment mistakes (Campbell, 2006).

On the housing market, it is important to mention that low interest rates and forecasts about it remaining low are considered key factors to the increase of house prices (Miles & Pillonca, 2008). In that cases, those predictions lead to positive assumptions, the same happens when a household has good expectations about their future revenue (Abraham et al., 2020).

A tool that is used to make this loan more affordable is expanding the duration of it, as it reduces the instalments and the household can maintain their level of consumption in other sectors as well (Van Gunten & Navot, 2018). It happens because households, in general, tend to prioritize current costs over life-time costs (Campbell & Cocco, 2003) even though they would have to reduce their expenses in case of unexpected payments increase (Bucks & Pence, 2008).

Therefore, even though this research is focused on trying to draw household's behaviour by the optic of framing effects theory, it is important to always reinforce that all these other variables, and more, are also influencing their behaviour, and it is not possible to track all of them in the model.

Chapter 3. Methodology

This section addresses the methodology for the research. First, it presents the general framework that guided the study. Then it addresses how the questionnaires were elaborated. After, it presents the methods for the survey application. Next, it makes a data and sample characterization. And in the end, it addresses the empirical framework defined for the analyses.

3.1 General Framework

This research follows an empirical method based on a survey, to check the possibility of changing the choices of the respondents by making subtle changes in the way the option is presented, in line with the extensive literature which addresses this subject. Previous studies helped to guide the methodology for this research, since the seminal to the most recent ones.

The prime paper to critic the expected utility theory was a survey made to verify reversion in preferences in students at Stanford University and University of British Columbia, conducted by the researchers Amos Tversky and Daniel Kahneman. This was made by applying different questionnaires to different groups of students, then, they counted how many people answered to each question and compared these results (Tversky & Kahneman, 1980).

Their survey was modulated to contain the same information passed in two different forms: one in positive terms and another in negative terms. Then, they would verify whether the preferences would change according to the frame where it was presented. They noticed that, presenting the choice in positive terms, the major part of the people selected options that reflected risk aversion behaviour (Kahneman & Tversky, 1979).

On the other hand, when presenting information in negative terms, respondents would perform a risk seeking behaviour, the authors called this reversion in preferences *reflection effect* (Kahneman & Tversky, 1979) and this is the type of effect that was expected to observed in this research (as it is going to be explained later).

A survey was also used to observe failures on the principles of rational choice (Tversky & Kahneman, 1986). They used the number of answers in each type of questionnaire to verify the change in the preference. Considering their sample, they applied the questionnaires to different groups of people. This way, they could understand that this behaviour was suffering by the framing effect, by verifying the number of responses in each group.

This way of evaluation answers was considered in this research to make a sanity check of the regression results.

More recently, Abraham et al. (2020) applied distinct types of questionnaires in undergraduates of University of Maryland (US) to discover the impact of information framing in the payment schemes of student loans. The authors designed the questionnaire in a way that reinforced the insurance or cost aspects of each loan payment scheme, and they found that the preference for each scheme can be changed (Abraham et al., 2020).

They considered an addition regression that relate the treatment with the expectations of the students about their future earnings, to understand if the chosen scheme would benefit this student (Abraham et al., 2020). Both models were used to guide this research model.

3.2 The definition of frames

This study uses two perspectives to identify framing effects: changing how the content is presented - *content effect* - and changing the position of the text - *position effect*. Both effects are part of the framing effect theory, however, it was decided to make this differentiation to make the analyses clearer, and for it to be possible to study the two points of the research question separately. They were named differently, for the purpose of understanding, and this was not related to previous studies denominations.

For this research, a survey was made to observe whether there are framing effects in the choice between a fixed and an adjustable interest rate when getting a new mortgage loan, in Portugal. For this survey, it was made six types of questionnaires with two possibilities of choice for loan modality (FRM and ARM), to simulate the decision. Those six types of questionnaires came from three types of structures that were made to observe the impact of *content*, merged with two types of approaches that had the intention of observing the impact of *position*.

The purpose of organizing the topics was to guarantee that each questionnaire would have the same basic information, which were: the type of the loan, the interest rate that was applied, the monthly instalment, the total amount of reimbursement (considering the borrowed value and the credit cost), the maximum value of Euribor 12M in the last 20 years and how much they would have to pay if this maximum interest rate was to be applied.

This way, the respondent would always have the same context to analyse, even though the structure of the information was different. These questionnaires were based on the

model content of ESIS (Bank of Portugal, 2015) of both fixed and adjustable-rate mortgages, that were simulated on February the twenty-third, two thousand twenty-two (02/23/2022). The questionnaires were created considering the information that is usually displayed in this document.

There were three frames (types of questionnaires) to evaluate the *content effect:* the *Neutral* frame, with a content similar to the original ESIS; the *Insurance* frame, with an additional phrase that reinforced the insurance provided by the FRM; and the *Cost* frame, with an additional phrase that reinforced the present extra cost incurred in the FRM option.

The information on those phrases was implicit in the main content, but it was necessary to make them more explicit precisely to see if they would influence the respondent perception. Therefore, those additional phrases were added to attend the purpose of the research, appearing in the non-neutral frames as a warning about the relevant aspect of the mortgage. The concept of each structure is:

- The Neutral Frame: this is the most similar frame to the traditional ESIS, where there was no additional warning about any aspect of the mortgage. This frame was defined in order to have comparability to the non-neutral frames.
- The Cost Frame: in this one, it was emphasized the cost aspect of a mortgage modality, such as the higher (lower) instalments in FRM (ARM).
- The Insurance Frame: this one was used to reinforce the risk of the modality that was presented. In the case of the FRM, the insurance of knowing exactly how much the respondent would pay during the loan. On the other hand, in the case of the ARM, it was presented the possibility of the increase in instalments due to changes in the interest rate index.

For each of these three frames, there were other two frames (types of questionnaires) to evaluate the *position* effect, namely, the "Active" and "Passive" approaches. So, it was considered "Active" when the message was presented sooner, and "Passive" when it was presented close to the end of the text.

In the non-neutral frames, the position of the warning phrase is important to observe how much they are relevant, based on the moment when it was presented. The information was organized into blocks that varied according to the approach, except in the neutral frame of FRM, as it going to be presented later.

The necessity of analysing the *position* comes from the perception that ESIS is an extensive document, so it matters if the information is presented sooner in the text or in the

end of a several number of pages. The information of each questionnaire and their structure are resumed in Table 1 and Table 2.

As informed before, the basic information is common to all questionnaires. They are showed in blocks A, B and C for fixed interest rate or 1, 2, 3 and 4, for adjustable interest rate. To analyse *content* and *position* effect, it was included the warning phrases in the cost frame, represented by D in FRM and 5 in ARM, and in the insurance frame as well, represented by E in FRM and 6 in ARM.

Table 1 - Blocks of phrases used at FRM Questionnaire

Block	Information at FRM Questionnaire
A	In that modality, the interest rate is fixed during all the loan duration.
B	The interest rate applied is 2.95%. The monthly instalment is 628.37€. The rate applied was the one offered by the bank, from the table of fixed rates for credit operations.
C	The total amount to be reimbursed is 243,585.31€, in which 150,000.00€ of it is the amount that was borrowed and 93,585.31€ is the total of the credit costs.
D (Phrase Cost)	Because it guarantees a fixed rate during the loan, the instalments tend to be higher, in comparison to the modality with adjustable rates.
E (Phrase Insurance)	You know exactly how much you will pay in all the duration of your loan, and you will have no surprises with the value of your monthly instalments.

Source: Own Elaboration

Table 2 - Blocks of phrases used at ARM Questionnaire

Block	Information at ARM Questionnaire
1	In that modality, the interest rate is adjustable during all the loan duration, it means that it could increase or decrease.
2	The interest rate applied is 1.473%, it corresponds to the value of Euribor 12M summed up to a spread of 1.950%. The monthly instalment is 515.74
3	Considering the maximum value of Euribor12M in the last 20 years, this interest rate would be 7.343%, this monthly instalment would be 1,032.74€ and this total amount to be reimbursed would be 389,550.40€.
4	On the actual market conditions, the total amount to be reimbursed is 201,211.26€, in which 150,000.00€ of it is the amount that was borrowed and 51,211.26€ is the total of the credit costs.
5 (Phrase Cost)	At the moment, you will have a smaller monthly instalment, in comparison to the modality with fixed rate.
6 (Phrase Insurance)	The change in the monthly instalment, resulting from the variations in the interest rate index, can be quite high. You should consider whether your household budget would support a significant variation in home loan changes.

Source: Own Elaboration

The questionnaires were organized according to the structure and approach that presented. All of them had the same structure, and the respondents would have to answer in

similar environments, which made questionnaires comparable. This arrangement is resumed in Table 3 and Table 4.

So, the survey always started with an introductory phrase, which presented the type of the loan (A for FRM and 1 for ARM). Then, in the passive questionnaire, the relevant and common aspects of the loan were put in the following positions (B, C for FRM and 2, 3, 4 for FRM), then the warning phrases were put in the end, to make the approach more subtle and simulate the delay in giving the message (D or E for FRM and 5 or 6 for ARM).

The active approach had the same phrases; however, the warning phrase appeared just after the introduction, to make the approach more incisive (D or E for FRM and 5 or 6 for ARM). Regarding the phrase about the maximum interest rate, it was also manipulated (3 for ARM), being in the active approach presented before the information about the actual interest rate for the loan, and in the passive approach, after that.

Each questionnaire presented the option for both modalities of interest rate (FRM or ARM), according to the same structure and approach between them, to make them comparable. The questionnaires were supposed to perform a reversion of respondent's preferences and this interaction will be detailed in section 4.5.

Though the study resulted in six questionnaires (combination of three *content effect* frames and two *position effect* ones), due to limitations on the number of respondents, it was decided to apply only four questionnaires to have more responses and more robust results. The questionnaires *NeutralActive* and *NeuralPassive* were both applied. The questionnaires *CostActive* was applied and *CostPassive* was not applied. Finally, the questionnaires *InsuranceActive* was applied and *InsurancePassive* was not applied.

Table 3 - Organization of the phrases in FRM Questionnaire

Organization in FRM Questionnaire					
Active			**Passive**		
Neutral	**Cost**	**Insurance**	**Neutral**	**Cost**	**Insurance**
A	A	A	A	A	A
B	D	E	B	B	B
C	B	B	C	C	C
	C	C		D	E

Source: Own Elaboration

Table 4 - Organization of the phrases in ARM Questionnaire

Organization in ARM Questionnaire

Active			Passive		
Neutral	**Cost**	**Insurance**	**Neutral**	**Cost**	**Insurance**
1	1	1	1	1	1
2	5	6	2	2	2
3	2	2	4	4	4
4	3	3	3	3	3
	4	4		5	6

Source: Own Elaboration

3.3 The survey design

The survey was conducted in the online format[5]. The e-mail with the link that led to the survey was shared by the Department of Communication and Image of the Dean's Office from the University of Porto, following the guidelines for survey application, including the data protection law. Both e-mail and initial page of the survey informed that the participation was voluntary, that the collected information was confidential, and it would be used just for the purpose of a research about the "Portuguese mortgage sector".

The purpose of the title was to create an environment where the respondents were aware that they were answering about the mortgage market, without informing them that this research was also observing their behaviour in that situation, so it can reduce bias on their choices. The respondents received a link for the survey and were randomly assigned to one of four types of questionnaires (*NeutralActive*, *NeuralPassive*, *CostActive* or *InsuranceActive*). In the beginning, the respondents were asked to inform some demographic aspects about their lives, namely: *age*, *gender*, *education*, academic background (*study*), family size (*fsize*), whether they had their own home or if it was rented (*OwnHouse*), and if they had any house mortgage or intended to have one (*Credit*). This part was the same for every respondent.

After, they had to answer the question regarding a mortgage choice. For all questionnaire types, it was put a statement, in the beginning, that informed about the value of the house and the loan, the duration of it and the number of instalments. They were also told that they should consider that they had financial capacity to pay for the loan.

> "Consider the following situation: You want to buy a house. For this, you will apply for a mortgage loan. Imagine that you have the financial capacity to take out the presented housing loan. The house you are interested in costs €200,000 and you have €50,000 to put down. You need a loan of €150,000 and the option suggested by the bank is a loan for a period of 30 years, which corresponds to a total of 360 monthly instalments. What do you prefer?" (Initial statement of the survey)

[5] The survey template with an example of CostActive treatment is presented in Annex 2.

Then, the respondent needed to choose between the option of a fixed interest rate or an adjustable interest rate mortgage. This part was modulated to analyse the *content effect* and *position effect*. It is important to reinforce that the questionnaires were made considering the content of the ESIS, in a way that it could simulate the decision of choosing which interest-rate type would be better for them.[6]

After the question about the mortgage type, the last part of the questionnaire focused on the respondent's expectations about interest rate. This included: (1) the interest rate considered to choose the mortgage option; (2) their expectation about increases and decreases on the Euribor rate in the next 5, 10 and 20 years (*Expect5*, *Expect10* and *Expect20*, respectively); (3) the maximum expected value that the Euribor 12M could reach in the loan period (*MaxEuribor*), as well as the maximum expected monthly instalment (*MaxInstalment*). All variables are resumed in Table 5.

Table 5 - Variables used in the questionnaire with code and name

Code	Variable	Name
S1	Questionnaire type	Type
P1	What is your age?	Age
P2	What gender do you identify with?	Gender
P9	What is your level of education?	Education
P3	What is your area of study?	Study
P4	How many members does your household have?	Fsize
P5	Do you have your own house?	OwnHouse
P6	Do you have any home loans?	Credit
P7	Do you live in a rented house or third-party housing?	Rented
P8	Have you ever had or thought about having a home loan?	IntCredit
P10	Type of house	HouseType
MM	Type of interest rate	Rate
D1	Neutral - Active frame	NeutralActive
D2	Neutral - Passive frame	NeutralPassive
D3	Cost - Active frame	CostActive
D4	Insurance - Active frame	InsuranceActive
Q1	Euribor 5 Year Expectation	Expect5
Q2	Euribor 10 Year Expectation	Expect10
Q3	Euribor 15 Year Expectation	Expect20
Q4	Maximum expected Euribor	MaxEuribor
Q5	Maximum expected installments	MaxInstalment

Source: Own Elaboration

3.4 Data and sample characterization

The sample was composed by workers from University of Porto (teaching and non-teaching staff), which was considered a group of people that may be more familiarized with the mortgage market, due to the age and experience.

[6] Because of the length of ESIS, it was not possible to "replicate" the entire document in the online survey as it would disperse the attention of respondents that are voluntarily answering.

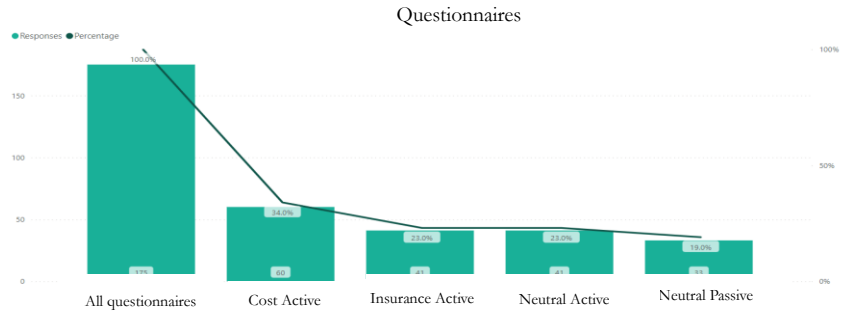
The e-mail was sent February 4th of two thousand and two to those enrolled in the "Inquéritos UP" list, that is a tool used to making surveys inside of the University of Porto, to a total of 36.468 recipients. The survey was kept open until May the twenty, two thousand twnty-two (05/20/2022) and received 582 answers, of which 186 were fully completed. As only respondents with age greater than 26 years were considered, the analysed sample included 175 answers.

The answers are resumed in the following graphics. Regarding the questionnaires, they were randomly assigned for those who accessed the link. Then, 41 answers were to *NeutralActive* questionnaire, 33 to *NeutralPassive*, 60 to *CostActive* and 41 to *InsuranceActive* questionnaire (Figure 1). A major part of the respondents, 52.6%, were women (Source: **Own Elaboration**

Figure 2), 24.6% of respondents were more than 50 years old, 18.9% were between 25 and 31 years, and 17.1% between 26 and 30 years (Figure 3).

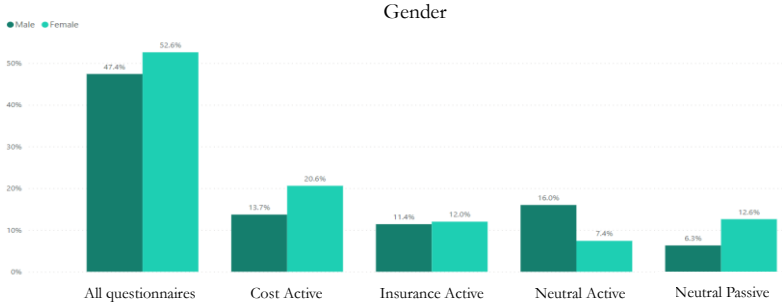
Considering the level of education, 38.3% had a doctor's degree, 29.1% had a master's degree, 28.6% had a bachelor's degree and 4.0% had finished the high school (Figure 4). The most part of the respondents had their scholar background in social science, trade and law (26.9%), followed by engineer, manufacturing industries and construction (20.6%) and science, mathematics and informatics (20.0%)(Figure 5). Then, 66.9% of them had their own house (Figure 6), of which 45.7% had mortgage credit Figure 7.

Figure 1 - Quantity and percentage of answers in each questionnaire



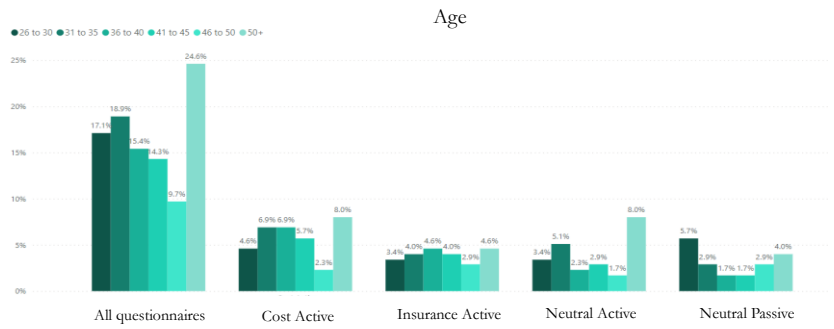
Source: Own Elaboration

Figure 2 - Percentage of answer in each gender



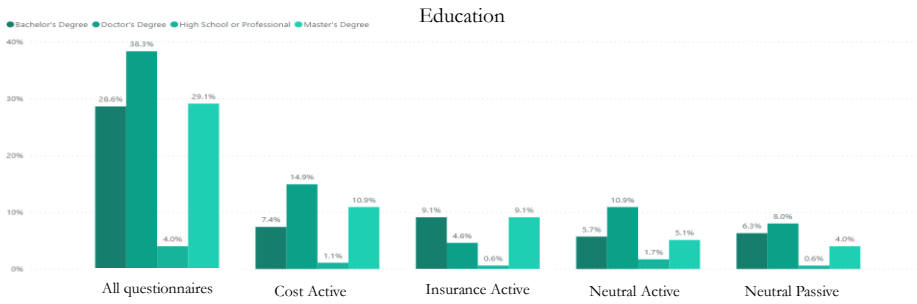
Source: Own Elaboration

Figure 3 - Percentage of answers in each age range



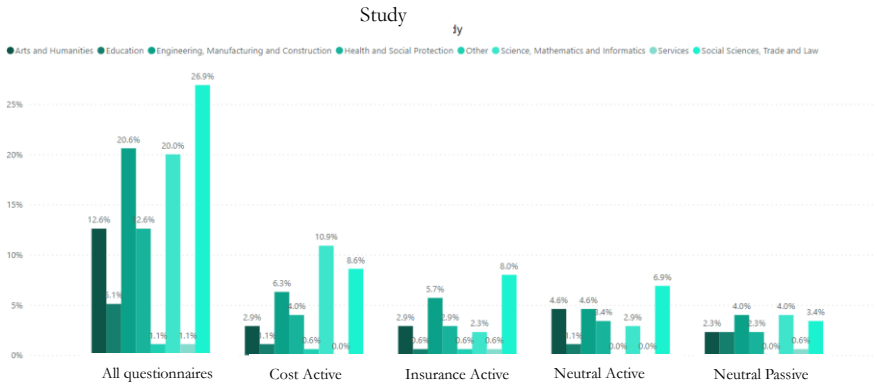
Source: Own Elaboration

Figure 4 - Percentage of answers in each level of education



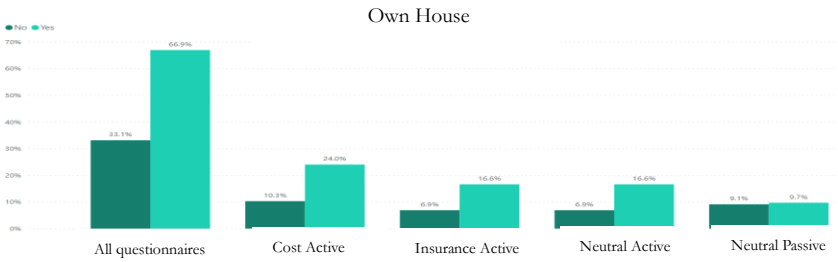
Source: Own Elaboration

Figure 5 - Percentage of answers in each area of study



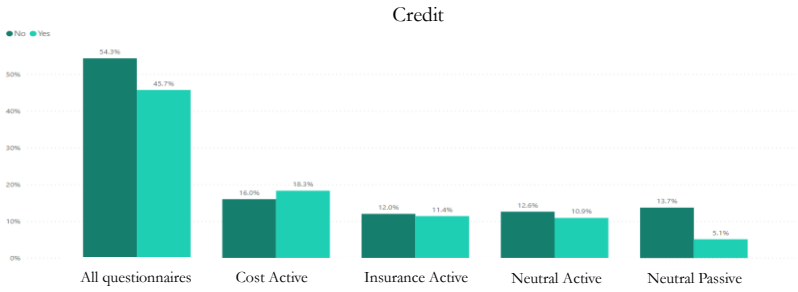
Source: Own Elaboration

Figure 6 - Percentage of answers about having own house



Source: Own Elaboration

Figure 7 - Percentage of answers about having a mortgage loan



Source: Own Elaboration

To validate the relationship between the variables and avoid multicollinearity, the correlation between variables was respected, and a person test was used. The result of this matrix points out to some expected interactions between variables, resumed in Table 6. For example, *Age* and *OwnHouse* have a positive relationship, showing that as the age increase, the probability of having an own house increase. On the other hand, *Age* and *Rented* showed a negative relationship.

The bigger correlations occur *OwnHouse* with *Credit* and *Rented*, which makes sense, as these variables depend on each other. The other variables have not presented a relevant coefficient, so it was possible to put away the possibility of multicollinearity.

Table 6 - Matrix of correlation of the variables

	Type	Age	Gender	Education	Study	Fsize	OwnHouse	Credit	Rented	IntCredit	HouseType	Expect5	Expect10	Expect20	MaxEuribor	MaxInstalment
Type	1.0000															
Age	-0.0312	1.0000														
Gender	0.1253	-0.0813	1.0000													
Education	-0.0909	0.2252	-0.0953	1.0000												
Study	0.0810	-0.0721	0.0719	-0.0037	1.0000											
Fsize	-0.0291	0.1756	0.0537	0.0028	-0.0146	1.0000										
OwnHouse	0.0388	0.5094	0.0119	0.2133	0.0673	0.2474	1.0000									
Credit	0.0721	0.0980	0.0676	-0.0425	0.0400	0.1866	0.6461	1.0000								
Rented	-0.0102	-0.4670	-0.0247	-0.2206	-0.1031	-0.1715	-0.9185	-0.5934	1.0000							
IntCredit	-0.0269	0.0138	0.0708	-0.0856	0.0414	-0.0236	0.0495	0.2891	-0.1057	1.0000						
HouseType	-0.0738	-0.1796	0.0283	-0.0158	0.0746	-0.2183	-0.3484	-0.2251	-0.0507	0.1257	1.0000					
Expect5	0.0292	0.0125	-0.1045	0.0825	0.0962	0.0519	-0.0323	-0.0459	0.0609	-0.0311	-0.0628	1.0000				
Expect10	0.0317	0.0465	-0.0412	0.0704	0.0508	0.1028	0.0605	-0.0047	-0.0681	-0.1270	0.0086	0.1442	1.0000			
Expect20	-0.0475	0.0897	-0.1197	0.0157	0.0055	0.0186	0.1021	0.1146	-0.1076	-0.1534	-0.0026	0.0705	0.3615	1.0000		
MaxEuribor	-0.0422	-0.0764	-0.0302	0.0160	0.0735	-0.0609	-0.1406	-0.1546	0.0953	-0.1198	0.1282	0.0968	0.0955	0.1206	1.0000	
MaxInstalment	0.0198	-0.1939	0.0987	0.0612	0.0234	0.0149	-0.0650	-0.0224	0.0125	0.0338	0.1335	0.1204	0.0568	0.1007	0.4305	1.0000

Source: Own Elaboration

3.5 Empirical Framework

Following Stango and Zinman (2011), the empirical framework relates the ability of the respondents to judge the proposition and tests how the framing effects impacts it. As the choice on type of interest rate is binary, it was used a Logit regression. Previous studies used an Ordinary Least Squares (OLS) model to make a similar analysis (Abraham et al., 2020). However, here it was used a Logit regression, as the model should represent the probability

of a binary choice, in this case, between FRM and ARM. Equation 1 shows the regression for the baseline model:

Equation 1 - Baseline model for testing the framing effect

$$Y = \alpha Frame + \gamma X + \varepsilon$$

Where Y is the dependent variable, that represents the respondent's choice in each questionnaire and assumes the values of:

$$Y = \begin{cases} 0 \; if \; chose \; FRM \\ 1 \; if \; chose \; ARM \end{cases}$$

Frame is the treatment variable that represents the framing in which the information was designed. For each treatment applied, *Frame* assumes the value of 1 for the questionnaire tested vs 0 for the questionnaire used as base/control scenario. *X* represents the control variables that include the demographic information reported by the respondents and ε represents the error term.

Through the baseline model, it was tested two phenomena, the *content effect* and the *position effect*, in a perspective of treatment effect. The idea was to verify, if the answers would be equal for different frames in comparison with the control frame, i.e., the *NeutralActive*. Therefore, the general definition for the hypotheses used to test the causality relationship between the questionnaires and the decision is:

H0: The questionnaires frame (treatment) will not influence the choice between interest rates.

H1: The questionnaires frame (treatment) will influence the choice between interest rates.

The options presented to the respondents were always the same but presented in different ways. Depending on the frame, it was expected that different questionnaires would influence the choice in distinct ways. In other words, in one frame a person would choose a type of interest rate, say ARM, and when it was presented in another frame, a person would have her preference reverted and choose FRM, even though the information was the same. This was tested with the logit regression.

It is important to reinforce that the questionnaires were answered by different people, to check the reversion in the preferences (Tversky & Kahneman, 1980), and that is why the control variables for the respondent's characteristics are so important.

To study the *content effect*, the treatment assumes two definitions: *Cost* and *Insurance*. In the first, the variable *Frame* equals to 1 if the respondent answered a *CostActive* questionnaire,

and 0 if the respondent answered a *NeutralActive*. In the latter, the variable *Frame* equals to 1 if the respondent answered an *InsuranceActive* questionnaire, and 0 if the respondent answered a *NeutralActive*. Following the same structure, to study the *positon effect*, the variable *Frame* equals to 1 if the respondent answered a *NeutralPassive* questionnaire, and 0 if the respondent answered a *NeutralActive*.[7]

Considering the *content* effect, it was expected that in *insurance* frame (*InsuranceActive*), it would have a higher probability of choosing FRM. This was expected because, according to similar studies (Abraham et al., 2020), respondents would find it better to choose a higher instalment in comparison with a riskier one. Therefore, the coefficient of the regression would be negative.

On the other hand, it was expected that in the *cost* frame (*CostActive*), it would have a higher probability of choosing ARM. This would happened because this frame was formulated to be more persuasive (Mohanty et al., 2021), towards risk-taking behaviour (Kahneman & Tversky, 1979), considering the scarce information about the ARM risks. Then, the respondents would perceive that smaller instalment is more attractive, in comparison with a safer alternative with higher instalment. The coefficient, in this case, would be positive.

Considering the *position* effect, it was supposed to have a higher probability of choosing FRM in *NeutralActive* questionnaire. The reason is that it was expected that that people would be more likely to be influenced by messages that were put sooner in the text. In opposition, it was expected that in the *NeutralPassive* treatment, the chance of choosing ARM would be higher, because when the warning phrase was in the end of the presented text, people would not even notice the phrase nor be convinced by it.

The *position effect* is captured more specifically in the neutral questionnaires, as there was no influence of the warning phrase, while in the non-neutral questionnaires, the position would just collaborate with the so-called *content effect*.

It was necessary to check the robustness of the models. A robustness check verified whether different respondents have similar characteristics. The tool used for this validation was the Kruskal-Wallis test. This way, it was possible to verify if there were significant differences between the groups selected to answer each questionnaire. It was important to make this test because there were four types of questionnaires, answered by different people, and

[7] As mentioned before, it was not possible to apply the six types of questionnaires and verify the treatment effect of a *CostPassive* or an *InsurancePassive* questionnaire.

the research should guarantee that these groups were similar so their answers could be compared.

The same test was also used to verify if there was a relationship between what the groups answered for *Expect5*, *Expect10* and *Expect20* in comparison with which interest rate type they chose. The interpretation for this approach was made by verifying whether there was a significant difference in the answer to interest rate type between the groups that answered to those questions.

Chapter 4. Results

This section will address the results for the logit regression and the robustness checks. The analysis of these results was made considering the two effects (*content* and *position*) separately. It was also considered the characteristics of the sample that was reached. First, it presents the results for the *content effect*, then the results for the *position effect*, and finally, the robustness checks.

4.1 Content Effect

Regarding the *content* analysis, this considerate a choice between FRM and ARM in *CostActive or InsuranceActive* questionnaires in comparison with the *NeutralActive* questionnaire. First it was estimated without any control variables, to verify the purely relationship between the structure of the warning phrases and the choice about the interest rate type that would rule the mortgage contract.

Starting with the treatment Cost, Table 7 describes the regression that tested the effect of answering to a *CostActive* questionnaire vs a *NeutralActive* one.

Table 7 - Logit regression for the CostActive treatment

Y = αCostActive + ε						
					Number of obs	101
					LR chi2(1)	1.38
					Prob > chi2	0.2403
Log likelihood	-69.273935				**Pseudo R2**	0.0099

Variable	**Coefficient**	**Std. err.**	**Z**	**P>|z|**	**[95% conf.**	**interval]**
CostActive	-0.4783719	0.4092120	-1.17	0.242	-1.280413	0.3236690
_cons	0.3448405	0.3170019	1.09	0.277	-0.2764718	0.9661528

Source: Own Elaboration

This was made to see if the treatment *CostActive* would be statistically different from zero, which did not happen, meaning that there is no difference in answers between the frames. However, different individuals answered the survey, thus, to have a more accurate analysis, it was necessary to include the control variables, to guarantee that individuals characteristics were considered.

Even though the version considering just *CostActive* was not significant, when it was compared individuals with the same characteristics, there is evidence that the questionnaire frame influenced the individuals answer. This result is described in Table 8.

Table 8 – Logit regression for the CostActive treatment with control variables

Y = αCostActive + γX + ε						
					Number of obs	100
					LR chi2(1)	28.76
					Prob > chi2	0.0173
Log likelihood	-54.914086				**Pseudo R2**	0.2075

Variable	**Coefficient**	**Std. err.**	**z**	**P>|z|**	**[95% conf.**	**interval]**
CostActive	-1.30413	0.5365223	-2.43	0.015	-2.355694	-0.2525656
Age						
26 to 30	-0.1284414	0.7994213	-0.16	0.872	-1.695278	1.438396
31 to 35	0.5682463	0.7256819	0.78	0.434	-0.8540642	1.990557
36 to 40	1.679709	0.8268724	2.03	0.042	0.0590689	3.300349
41 to 45	1.354855	0.8012428	1.69	0.091	-0.2155519	2.925262
46 to 50	3.099652	1.351535	2.29	0.022	0.4506925	5.748612
50+	0.000000	(omitted)				
Education						
High School or professional	-1.455643	1.285145	-1.13	0.257	-3.974481	1.063196
Bachelor's Degree	-0.1768638	0.6609841	-0.27	0.789	-1.472369	1.118641
Master's Degree	1.182747	0.6837336	1.73	0.084	-0.1573461	2.52284
Doctor's Degree	0.000000	(omitted)				
Study						
Education	-2.300025	1.494961	-1.54	0.124	-5.230094	0.6300451
Arts and Humanities	-1.172611	0.9608235	-1.22	0.222	-3.055791	0.7105684
Social Sciences, Trade and Law	-1.981233	0.8920596	-2.22	0.026	-3.729637	-0.2328278
Science, Mathematics and Informatics	-0.060212	0.8507054	-0.07	0.944	-1.727564	1.60714
Engineering, Manufacturing and Construction	-0.3097138	0.8611277	-0.36	0.719	-1.997493	1.378065
Health and Social Protection	0	(omitted)				
Other	0	(empty)				
_cons	0.7009314	0.8002871	0.88	0.381	-0.8676024	2.269465

Source: Own Elaboration

Considering the results, the p-value of the treatment indicated that, by controlling for the respondent's characteristics, the answers were different between the questionnaires, and the negative coefficients of *CostActive* questionnaire indicated that the probability of choosing FRM in the this manipulated frame (Y=0) is higher, as Y is smaller.

Then, it was made a test to verify the accuracy of the model. This was done by classifying the predictions of the model. Based on that, the model made a correct classification in a rate of 75%, which is important when estimating if this model is in fact able to replicate the behaviour of the variables. These results are resumed in Table 9.

Table 9 - Percentage of correct classification of the content model, in CostActive questionnaire

	True		
Classified	**D**	**~D**	**Total**
+	38	12	50
-	13	37	50
Total	51	49	100

Correctly classified	75.00%

Source: Own Elaboration

The chi-squared test also indicated that it is possible to reject the null hypothesis (H0) for this model. It means that the judgment of the respondents has changed based on the information that they received to get to a decision, which corroborates with the other results that were previously presented. The chi-squared test is resumed in Table 10.

Table 10 - Chi-squared test for content effect in CostActive questionnaire

Rate	**CostActive**		**Total**
	FRM	**ARM**	
0	17	32	49
	0.4	0.3	0.7
1	24	28	52
	0.4	0.3	0.7
Total	41	60	101
	0.8	0.6	1.4

Person chi2 (1) =	1.3739
Pr =	0.241
gama =	-0.2347
ASE =	0.193

Source: Own Elaboration

The analysis for *InsuranceActive* was similar to the previous analysis of *CostActive*. First it was estimated a logit to verify if the answers in *InsuranceActive* differed significantly from the answers in *NeutralActive*. This result is resumed in table Table 11. The p-value of this regression showed that there was no significant difference between these answers.

Table 11 – Logit regression for InsuranceActive treatment

Y = αInsuranceActive+ ε	
Number of obs	**82**
LR chi2(1)	**1.23**
Prob > chi2	**0.2683**

Log likelihood	-56.127716			Pseudo R2	0.0108

Variable	Coeffi-cient	Std. err.	z	P>|z|	[95% conf.	interval]
InsuranceActive	-0.491444	0.4456190	-1.10	0.270	-1.364841	0.3819533
_cons	0.3448405	0.3170019	1.09	0.277	-0.2764718	0.9661528

Source: Own Elaboration

However, it was necessary to control for demographic variables to guarantee that the comparison was between similar individuals. The analysis of the results showed that similar individuals answered to those different frames in a significant different way, therefore it was possible to reject the null hypothesis, as the questionnaire frame influenced the choice between interest rates, represented by the p-value < 0.05. This result is resumed in Table 12.

Table 12 - Logit regression for the Insurance treatment with control variables

Y = αInsuranceActive + γX + ε						
					Number of obs	80
					LR chi2(1)	20.98
					Prob > chi2	0.1022
Log likelihood	-44.862534				Pseudo R2	0.1895

Variable	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
InsuranceActive	-1.221597	0.6165931	-1.98	0.048	-2.430098	-0.013097
Age						
26 to 30	2.17681	0.9561871	2.28	0.023	0.3027173	4.050902
31 to 35	1.45978	0.8873778	1.65	0.100	-0.2794485	3.199008
36 to 40	1.412628	0.9565931	1.48	0.140	-0.4622595	3.287516
41 to 45	3.171195	1.09052	2.91	0.004	1.033815	5.308575
46 to 50	2.089014	1.031151	2.03	0.043	0.0679953	4.110033
50+	0.000000	(omitted)				
Education						
High School or professional	-1.782827	1.583433	-1.13	0.260	-4.886298	1.320645
Bachelor's Degree	-0.2735975	0.7201619	-0.38	0.704	-1.685089	1.137894
Master's Degree	0.0807431	0.7832898	0.10	0.918	-1.454477	1.615963
Doctor's Degree	0.000000	(omitted)				
Study						
Education	-2.98735	1.668755	-1.79	0.073	-6.25805	0.2833496
Arts and Humanities	-2.399602	1.182781	-2.03	0.042	-4.71781	-0.0813945
Social Sciences, Trade and Law	-2.454445	1.052101	-2.33	0.020	-4.516526	-0.3923649
Science, Mathematics and Informatics	-2.175118	1.20374	-1.81	0.071	-4.534404	0.1841682
Engineering, Manufacturing and Construction	-1.566049	1.034809	-1.51	0.130	-3.594237	0.4621385
Health and Social Protection	0	(omitted)				
Services	0	(empty)				
Other	0.000000	(empty)				

_cons	1.312696	0.946325	1.390000	0.165000	-0.542067	3.167458

Source: Own Elaboration

The coefficient of the treatment was negative, which shows that the value for the dependent variable is smaller. Therefore, considering that the groups of individuals are similar, the probability of choosing FRM (Y=0) is higher. The predictions of the model were also interpreted, and the model could classify it correctly in 65% of the cases. This result is resumed in Table 13.

Table 13 - Percentage of correct classification of the content model, in InsuranceActive questionnaire

	True		
Classified	**D**	**~D**	**Total**
+	29	15	44
-	13	23	36
Total	42	38	80

Correctly classified	65.00%

Source: Own Elaboration

It was also made an analysis of the chi-squared test to validate the significance of the model, and this test also indicated that the answers in *InsuranceActive* questionnaire were statistically different from the answers of *NeutralActive* questionnaire, which is in line with the framing effect theory, so it was also possible to reject the null hypothesis for this case. This is resumed in Table 14.

Table 14 - Chi-squared test for content effect in InsuranceActive questionnaire

Rate	**InsuranceActive**		**Total**
	FRM	**ARM**	
0	17	22	39
	0.3	0.3	0.6
1	24	19	43
	0.3	0.3	0.6
Total	41	41	82
	0.6	0.6	1.2

Person chi2 (1) =	1.2224
Pr =	0.269
gama =	-0.2409
ASE =	0.21

Source: Own Elaboration

4.2 Position Effect

Regarding the *position* analysis, the same methodology was used to verify this influence of the non-neutral frames, with the difference that the treatment was defined as the *NeutralPassive* questionnaire. Table 15 describes the regression that tested *NeutralPassive* questionnaire in comparison with a NeutralActive one.

Table 15 - Logit regression for the NeutralPassive treatment

Y = αNeutralPassive + ε						
					Number of obs	74
					LR chi2(1)	3.63
					Prob > chi2	0.0566
Log likelihood	-49.449434				**Pseudo R2**	0.0354

Variables	**Coefficient**	**Std. err.**	**z**	**P>|z|**	**[95% conf.**	**interval]**
NeutralPassive	-0.9044563	0.4810848	-1.88	0.060	-1.847365	0.0384526
_cons	0.3448405	0.3170019	1.09	0.277	-0.2764718	0.9661528

Source: Own Elaboration

By considering the control variables, the p-value showed that there was no significant difference in answers between people who answered *NeutralActive* and *NeutralPassive* questionnaires. Therefore, it was necessary to control for demographic characteristics, to compare similar individuals. This result is described in Table 16.

Table 16 - Logit regression for the NeutralPassive treatment with control variables

Y = αNeutralPassive + γX + ε						
					Number of obs	73
					LR chi2(1)	18.38
					Prob > chi2	0.1900
Log likelihood	-41.402683				**Pseudo R2**	0.1817

Variable	**Coefficient**	**Std. err.**	**z**	**P>|z|**	**[95% conf.**	**interval]**
NeutralPassive	-1.415912	0.6084712	-2.33	0.020	-2.608494	-0.2233303
Age						
26 to 30	0.4109314	0.8930336	0.46	0.645	-1.339382	2.161245
31 to 35	0.8438428	0.8448581	1.00	0.318	-0.8120487	2.499734
36 to 40	1.22473	1.091088	1.12	0.262	-0.9137628	3.363224
41 to 45	0.6747307	1.037355	0.65	0.515	-1.358447	2.707909
46 to 50	2.814596	1.163423	2.42	0.016	0.5343278	5.094864
50+	0	(omitted)				

Education						
High School or professional	-1.324401	1.327956	-1.00	0.319	-3.927147	1.278344
Bachelor's Degree	-0.6423058	0.7838672	-0.82	0.413	-2.178657	0.8940456
Master's Degree	0.1950544	0.8320433	0.23	0.815	-1.435721	1.825829
Doctor's Degree	0	(omitted)				
Study						
Education	-1.830864	1.266712	-1.45	0.148	-4.313573	0.6518456
Arts and Humanities	-1.073397	1.027622	-1.04	0.296	-3.0875	0.940706
Social Sciences, Trade and Law	-2.309384	1.020076	-2.26	0.024	-4.308696	-0.3100721
Science, Mathematics and Informatics	-0.4716109	1.023128	-0.46	0.645	-2.476904	1.533682
Engineering, Manufacturing and Construction	-1.060178	0.9743359	-1.09	0.277	-2.969841	0.8494849
Health and Social Protection	0	(omitted)				
Services	0	(empty)				
_cons	1.229583	0.9657069	1.27	0.203	-0.6631676	3.122334

Source: Own Elaboration

The analysis of the p-value showed that the coefficient of *NeutralPassive* treatment was significantly different from zero, which means that there were different answers in different questionnaires. The coefficient of this regression was negative, which also indicated a higher probability of choosing FRM.

Regarding the accuracy of the model, the model made a correct classification in a rate of 72.60%. These results are resumed in Table 17. The chi-squared test also indicated that the respondent's judgment was influenced by the questionnaire that they received, which permitted to reject the null hypothesis. This test is resumed in Table 18.

Table 17 - Percentage of correct classification of the position model

	True		
Classified	**D**	**~D**	**Total**
+	26	10	36
-	10	27	37
Total	36	37	73

Correctly classified	**72.60%**

Source: Own Elaboration

Table 18 - Chi-squared test for position effect

Rate	**NeutralPassive**		**Total**
	FRM	**ARM**	
0	17	21	38

	0.8	1	1.8
1	24	12	36
	0.8	1	1.8
Total	41	33	74
	1.6	2	3.6

Person chi2 (1) =	3.5982
Pr =	0.058
gama =	-0.4237
ASE =	0.197

Source: Own Elaboration

4.3 Robustness checks

A Kruskal-Wallis test was made to verify if the groups were different between each other, therefore see if the results would be comparable. This test was made by verifying the difference between the respondents' groups to each variable, inside of each questionnaire. According to the p-value of Table 19, apart from gender, the characteristics of the people who answered to the four questionnaires were not significantly different for a confidence interval of 95%.

Table 19 - Kruskal–Wallis coefficients for the difference between variables

Kruskal–Wallis coefficients	Age	Gender	Education	Study	Fsize	OwnHouse	Credit	Rented	IntCredit	HouseType	Expect5	Expect10	Expect20	MaxEuribor	MaxInstalment
chi2(3)	1.538	8.29	5.092	1.254	0.822	2.861	4.507	2.62	0.61	1.674	0.294	0.347	1.941	2.257	6.209
Prob	0.6735	0.0404	0.1652	0.7402	0.8442	0.4136	0.2117	0.454	0.8942	0.6428	0.9611	0.9509	0.5848	0.5207	0.1019

Source: Own Elaboration

The same test was used as well to verify coherency in the answers for the type of interest rate and the interest rate expectation. This was made to guarantee that the groups that chose for FRM and ARM did not have significant differences regarding the expectation. In fact, according to the p-value of Table 20, this difference was not significant in the question *Expect5* and *Expect20*, however, the variable *Expect10* presented significant differences between groups for a confidence level of 95%.

These results points to the possibility that the choice was influenced by the respondents' expectations about the interest rate. However, it does not explain if the questionnaire frame influenced those long run expectations. This question cannot be answered by this survey, as it was not possible to verify people's expectations before and after answering the survey.

Table 20 - Kruskal–Wallis coefficients of interest rate expectations

Kruskal–Wallis coefficients	Expect5	Expect10	Expect20
chi2(3)	0.014	8.888	0.572
Prob	0.907	0.0029	0.4493

Source: Own Elaboration

Chapter 5. Conclusion

This research intended to understand the behaviour of borrowers during the decision of interest rate type for a mortgage loan, through the optic of the framing effects theory. The objective was to verify whether the borrower judgement about the risk associated with each interest rate modality could be changed with *content* and *position* manipulation.

Regarding the *content* manipulation, the results showed that hypotheses about the choice were accurate. When controlling for demographic information, the null hypothesis was rejected in both regressions, which indicated that the questionnaire frame influenced the individuals' answers.

It was expected that in *InsuranceActive* questionnaire, people would choose FRM, and the negative coefficients in this regression indicated a higher probability of choosing it. On the other hand, in *CostActive*, it was expected that the choice would be for ARM, but the observed result indicated that the most probable choice would not be that.

Concerning the *position* manipulation, it was expected that in *NeutralPassive* questionnaires, respondents would prefer ARM. The results were not aligned with this expectation. They indicated that the probability of choosing FRM in *NeutralPassive* was higher.

A series of reasons can explain the results that differed from the expectations. The models showed that *Age*, *Education* and *Study* were relevant explanation variables, controlling for them made the changes in preferences statistically significative. Though, there are other variables that can influence the judgment of the borrowers, that are beyond the scope of this study.

In fact, the survey was applied in a moment of instability in the world (Russo-Ukrainian war, Euribor increasement, Covid-19 sequels…), thus, this scenario could have also influenced the respondents to choose for FRM, because it guarantees not only a fixed total amount of payment, but it also provides insurance in a time of high insecurity. This choice is coherent, as the research showed that those respondents expected this rate to increase in the following years.

Both manipulations were used to test the framing effect in the context of mortgage loan acquirement, and they confirmed the presence of this effect on the questionnaire answers, following hypothesis *H1*. Thus, *content* and *position* do influence the borrower judgment on mortgage decision and can influence the interest rate choice.

Considering that the results showed the relevance of the content of the message and the position where it is presented, the ESIS is not being used in its maximum level of

efficiency, because even though this tool inform the borrowers about the maximum level of the index for the interest rate, this warning could be more emphasized. Also, the repayment table, that contains this information in more detail, is just presented in the end of the document, so it can go unnoticed by the borrower.

One way to mitigate this issue can be the presence of counselling. Even though banks have methods to reduce the risk associated with their transactions, they could include in the negotiations of a mortgage loan a section that explicit inform the risks of an increase of the interest rate, that could be done even by the manager in charge of that negotiation.

This type of action can increase the level of finance literacy on the clients, considering that *study* and *education* are a relevant variable to influence judgment. It is a practical solution that complements the ESIS, without making a change on the structure of the ESIS itself.

This research had a limitation for the number of respondents, as it could just reach voluntarily answers from the University of Porto workers. Further studies can be done to show how a change in the ESIS could impact the borrower's perception in a greater sample, this way it could test with multiple questionnaires with different structures and approaches.

Another important inclusion in this research could be questionnaires with mixed types of interest rate (part ARM and part FRM, for example), as this could be a more reliable representation of the borrower's experience. Lastly, it could be made research to check if the information can influence the borrower expectation about interest rate, as well as the inclusion of other formats of transmitting the message (e.g., in a table with values, as a figure…) could lead to interesting insights.

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Annexes

Annex 1: Model of the European Standardized Information Sheet

This consists of the model of the ESIS, retrieved from the MCOB 5A.5 content of European Standardized Information Sheets (ESIS), from the Financial Conduct Authority (2021) guidelines.

Introduction
This document was produced for [name of consumer] on [current date]. This document was produced on the basis of the information that you have provided so far and on the current financial market conditions. The information below remains valid until [validity date], (where applicable) apart from the interest rate and other costs. After that date, it may change in line with market conditions. (Where applicable) This document does not constitute an obligation for [name of creditor] to grant you a loan.
1. Lender
[Name] {Telephone number] [Geo- graphical address] (Optional) [Email address] (Optional) [Fax number] (Optional) [Web ad- dress] (Optional) [Contact per- son/point] (Where applicable, information as to whether advisory services are being provided:) [(We recommend, having assessed your needs and circumstances, that you take out this mortgage. We are not recommending a particular mortgage for you. However, based on your answers to some questions, we are giving you information about this mortgage so that you can make your own choice.)]
2. (Where applicable) Credit intermediary
Introduction
[Name] {Telephone number] [Geographical address] (Optional) [Email address] (Optional) [Fax number] (Optional) [Web address] (Optional) [Contact person/point] (Where applicable [information as to whether advisory services are being provided]):

[(We recommend, having assessed your needs and circumstances, that you take out this mortgage. We are not recommending a particular mortgage for you. However, based on your answers to some questions, we are giving you information about this mortgage so that you can make your own choice.)]

[Remuneration]

3. Main features of the loan

Amount and currency of the loan to be granted: [value][currency] (Where applicable) This loan is not in pound sterling.

(Where applicable) The value of your loan in sterling could change.

(Where applicable) For example, if the value of sterling fell by 20% relative to [credit currency], the value of your loan would increase to [insert amount in sterling]. However, it could be more than this if the value of sterling falls by more than 20%.

(Where applicable) The maximum value of your loan will be [insert amount in sterling]. (Where applicable) You will receive a warning if the credit amount reaches [insert amount in sterling]. (Where applicable) You will have the opportunity to [insert right to renegotiate foreign currency loan or right to convert loan into [relevant currency] and conditions].

Duration of the loan: [duration]

{Type of loan]

{Type of applicable interest rate]

Total amount to be reimbursed (repaid):

This means that you will pay back [amount] for every [unit of the currency] borrowed.

(Where applicable) {This/Part of this] is an interest-only loan. You will still owe [insert amount of loan on an interest-only basis] at the end of the mortgage term.

(Where applicable) Value of the property assumed to prepare this information sheet: [insert amount]

(Where applicable) Maximum available loan amount relative to the value of the property [insert ratio] or Minimum value of the property required to borrow the illustrated amount [insert amount]

(Where applicable) [Security]

4. Interest rate and other costs

Introduction

The annual percentage rate of charge (APRC) is the total cost of the loan expressed as an annual percentage. The APRC is provided to help you to compare different offers.

The APRC applicable to your loan is [APRC]. It comprises:

Interest rate [value in percentage or, where applicable, indication of a reference rate and percentage value of creditor's spread] [Other components of the APRC]

Costs to be paid on a one-off basis

(Where applicable) You will need to pay a fee to register the mortgage. [Insert amount of fee where known or basis for calculation.]

Costs to be paid regularly (Where applicable) This APRC is calculated using assumptions regarding the interest rate. (Where applicable) Because [part og your loan is a variable interest rate loan, the actual APRC could be different from this APRC if the interest rate for your loan changes. For example, if the interest rate rose to [scenario as described in Part B], the APRC could increase to [insert illustrative APRC corresponding to the scenario]. (Where applicable) Please note that this APRC is calculated on the basis that the interest rate remains at the level fixed for the initial period throughout the duration of the contract. (Where applicable) The following costs are not known to the lender and are therefore not included in the APRC: [Costs] (Where applicable) You will need to pay a fee to register the mortgage. Please make sure that you are aware of all other taxes and costs associated with your loan.
5. Frequency and number of payments
Repayment frequency: [frequency] Number of payments: [number]
6. Amount of each instalment
Introduction
[Amount] [currency] Your income may change. Please consider whether you will still be able to afford your [frequency] repayment instalments if your income falls. (Where applicable) Because [this/part of this] is an interest-only loan you will need to make separate arrangements to repay the [insert amount of loan on an interest-only basis] you will owe at the end of the mortgage term. Remember to add any extra payments you will need to make to the instalment amount shown here. (Where applicable) The interest rate on [part of} this loan can change. This means the amount of your instalments could increase or decrease. For example, if the interest rate rose to [scenario as described in Part B], your payments could increase to [insert instalment amount corresponding to the scenario]. (Where applicable) The value of the amount you have to pay in sterling each [frequency of instalment] could change. (Where applicable) Your payments could increase to [insert maximum amount in sterling] each [insert period]. (Where applicable) For example, if the value of sterling fell by 20% relative to [credit currency], you would have to pay an extra [insert amount in sterling] each [insert period]. Your payments could increase by more than this. (Where applicable) The exchange rate used for converting your repayment in [credit currency] to sterling will be the rate published by [name of institution publishing exchange rate] on [date] or will be calculated on [date] using [insert name of benchmark or method of calculation]. (Where applicable) [Details on tied savings products, deferred-interest loans]
7. (Where applicable) Illustrative repayment table
This table shows the amount to be paid every [frequency]. The instalments (column [relevant no]) are the sum of interest to be paid (column [relevant no]), where applicable, capital paid (column [relevant no]) and, where applicable, other costs (column [relevant no]). {Where applicable] The costs in the other costs column relate to [list of costs]. Outstanding capital (column [relevant no]) is the amount of the loan that remains to be reimbursed (repaid) after each instalment. {Table]

8. Additional obligations
The borrower must comply with the following obligations in order to benefit from the lending conditions described in this document. [Obligations] (Where applicable) Please note that the lending conditions described in this document (including the interest rate) may change if these obligations are not complied with. (Where applicable) Please note the possible consequences of terminating at a later stage any of the ancillary services relating to the loan: [Consequences)
9. Early repayment
Introduction
You have the possibility (the right to) to repay this loan early, either fully or partially. (Where applicable) [Conditions] (Where applicable) Exit charge (Early repayment charge): [insert amount or, where not possible, the method of calculation] (Where applicable) Should you decide to repay this loan early, please contact us to ascertain the exact level of the exit charge (early repayment charge) at that moment.
10. Flexible features
(Where applicable) [Information on portability/subrogation] You have the possibility to (the right to) transfer this loan to another [lender][or] [property]. [Insert conditions] (Where applicable) You do not have the possibility to (the right to) transfer this loan to another [lender] [or] [property]. (Where applicable) Additional features: [insert explanation of additional features listed in Part B and, optionally, any other features offered by the lender as part of the credit agreement not referred to in previous sections].
11. Other rights of the borrower
You have [length of reflection period] after [point in time when the reflection period begins] to reflect before committing yourself to taking out this loan.
12. Complaints
If you have a complaint, please contact [insert internal contact point and source of information on procedure]. (Where applicable) Maximum time for handling the complaint [period of time] (Where applicable) [If we do not resolve the complaint to your satisfaction internally,] you can also contact: [insert name of external body for out-of-court complaints and redress]
13. Non-compliance with the commitments linked to the loan: consequences for the borrower
{Types of non-compliance] [Financial and/or legal consequences] Should you encounter difficulties in making your [frequency] payments, please contact us straight away to explore possible solutions. (Where applicable) As a last resort, your home may be repossessed if you do not keep up with payments.
(Where applicable) 14. Additional information

(Where applicable) [Indication of the law applicable to the credit contract]. (Where the lender intends to use a language different from the language of the ESIS) Information and contractual terms will be supplied in [language]. With your consent, we intend to communicate in [language/s] during the duration of the credit agreement. [Insert statement on right to be provided with or offered, as applicable, a draft credit agreement]
15. Supervisor
Introduction
This lender is supervised by [Name(s), and web address(es) of supervisory authority/ies] (Where applicable) This credit intermediary is supervised by [Name and web address of supervisory authority].

Source: Financial Conduct Authority (2021).

Annex 2: Survey template – CostActive

Demographic Aspects (general)

a) What is your age?

-26 to 30

-31 to 35

-36 to 40

-41 to 45

-46 to 50

-50+

b) What gender do you identify with?

-Male

-Female

c) What is your level of education?

- High School or professional
- Bachelor's Degree
- Master's Degree
- Doctor's Degree

d) What is your area of study?

- Education
- Arts and Humanities
- Social Sciences, Trade and Law
- Science, Mathematics and Informatics
- Engineering, Manufacturing and Construction
- Health and Social Protection
- Services

-Other

e) How many members does your household have?

f) Do you have your own house?

-Yes

-No

g) Do you have any home loans?

-Yes

-No

h) Do you live in a rented house or third-party housing?

-Rented

-Third-part housing

i) Have you ever had or thought about having a home loan?

-Yes

-No

Treatment: CostActive (change due to the questionnaire type)

Consider the following situation: You want to buy a house. For this, you will ap-ply for a mortgage loan. Imagine that you have the financial capacity to take out the presented housing loan. The house you are interested in costs €200,000 and you have €50,000 to put down. You need a loan of €150,000 and the option suggested by the bank is a loan for a period of 30 years, which corresponds to a total of 360 monthly instalments. What do you prefer?

FRM	**ARM**
In that modality, the interest rate is fixed during all the loan duration. Because it guarantees a fixed rate during the loan, the instalments tend to be higher, in comparison to the modality with adjustable rates. The interest rate applied is 2.95%. The monthly instalment is 628.37€. The rate applied was the one offered by the bank, from the table of fixed rates for credit operations. The total amount to be reimbursed is 243,585.31€, in which 150,000.00€ of it is	In that modality, the interest rate is adjusta-ble during all the loan duration, it means that it could increase or decrease. At the moment, you will have a smaller monthly instalment, in comparison to the modality with fixed rate. The interest rate applied is 1.473%, it corre-sponds to the value of Euribor 12M summed up to a spread of 1.950%. The monthly instalment is 515.74 Considering the maximum value of Euri-bor12M in the last 20 years, this interest rate

the amount that was borrowed and 93,585.31€ is the total of the credit costs.	would be 7.343%, this monthly instalment would be 1,032.74€ and this total amount to be reimbursed would be 389,550.40€. On the actual market conditions, the total amount to be reimbursed is 201,211.26€, in which 150,000.00€ of it is the amount that was borrowed and 51,211.26€ is the total of the credit costs.

Mortgage Knowledge (general)

a) What is your expectation for the Euribor 12M value over the next 5 years, compared to its current value?
   -Goes up
   -Goes down

b) And for the next 10 years?
   -Goes up
   -Goes down

c) And for the next 20 years?
   -Goes up
   -Goes down

d) What is the highest Euribor 12M value that you expected to see over the duration of the loan?

e) And what is the maximum installment you expected to observe over the course of the loan?

Source: Own Elaboration