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Conned by a Cashback? Disclosure, Nudges and Consumer Rationality in Mortgage Choice

Michael King and Anuj Pratap Singh

TEP Working Paper No. 1118

November 2018

Trinity Economics Papers
Department of Economics

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Michael King * Anuj Pratap Singh†

November 29, 2018

Abstract

Financial products with a cashback feature typically cost consumers more in the long run, but their popularity is rising in the mortgage and credit markets. Using a nationally representative online sample from Ireland, we find that consumers who are younger, less educated and suffer from present bias are more likely to choose costly cash back mortgages. Through a series of experiments, we provide strong evidence that advanced disclosure improves financial decision making of customers and that negative nudges, or advertising, encourages prospective buyers into more costly mortgages. We also find evidence that consumers who demonstrate limited attention bias choose more expensive cashback mortgages that are financially equivalent at the point of drawdown.

Keywords: Consumer Protection, Mortgages, Behavioural Biases, Marketing Nudges, Choice Experiment
JEL codes: D15, G21, G28, G41, M3.

*Dept. of Economics, Trinity College Dublin, Ireland
†PhD Candidate at the Department of Economics, Trinity College Dublin. The authors would like to thank Orla McKiernan for her assistance in compiling the market data and Syon Bhanot, Liam Delaney, John FitzGerald, Patrick Honohan and Jeffrey Naecker for helpful comments. The authors are responsible for any errors and omissions.

1 Introduction

Cashback offers are employed by banks to encourage consumers to sign-up to mortgages and credit cards. Cashback benefits are a feature of 44 percent of mortgage products in Canada, 51 percent of mortgages in Ireland and 54 percent of mortgages in the United Kingdom (UK), while the proportion of credit cards with a cash back feature ranged between 40 percent and 85 percent in Australia, Canada, New Zealand, the UK and the United States.[1] However, products with cashback features are typically associated with higher interest rates and higher total cost of borrowing. We study consumer preferences for expensive cashback mortgages in Ireland, where the average cashback mortgage is €32,000 more expensive over 30 years.[2] To do this, we conduct a series of parallel experiments with an online representative panel. This enables us to explore the behavioural causes of mortgage choice, and estimate the impact of advanced, behaviourally informed disclosures, and bank marketing on consumer preferences.

The standard expected utility model assumes that informed rational consumers evaluate all options available in the market and choose an option that results in the lowest overall cost, implying that banks, aware of consumer rationality, will compete to provide the lowest cost products (Barr et al., 2008). However, the mortgage market is the perfect setting for asymmetric information and information failures, where not-so-informed consumers interact with skilled and well-informed sellers (Woodward and Hall, 2012). Differences in consumer knowledge, search costs, or ability to comparison shop can lead to a multi-price market equilibrium in which less-informed consumers pay higher average prices than more-informed consumers (Salop and Stiglitz, 1977; Salop, 1977; Wilde and Schwartz, 1979; Gabaix and Laibson, 2006).

The negative effect of information mismatch between mortgage buyers and sellers is aggravated by cognitive behavioural biases. As suggested by De Meza et al. (2008), financial capabilities and literacy do not guarantee pareto-efficient outcomes because the decision of people regarding financial options may severely depend on their behavioural and psychological attributes. Even with a full set of information, consumers make sub-optimal long-run decisions; often getting lost in overwhelming amount of market options, and making predictable mistakes (Thaler, 1985; Barr et al., 2008; Estelami, 2001). Other customers engage in heuristic decision making by picking the most striking attribute of a loan (Perry and Lee, 2012). Compounding this, the presence of mandated disclosure sometimes leads consumers to make a strong assumption that the state has undertaken all necessary steps to protect their interests (Warren, 2008).

Exacerbating these consumer heuristics is behaviourally informed marketing by banks. Advertising can encourage consumers to become distracted by certain product characteristics, such as

[1] A survey of products from Australia, Canada, Ireland, New Zealand, the UK and the US was conducted in the summer of 2018. Specifically, we surveyed six top banks in Canada, all banks in Ireland and thirteen top mortgage providers in the UK.

[2] This difference is estimated for a mortgage of €300,000 for house price of €350,000 using interest rates prevailing in Irish mortgage market in July, 2018.

cashback benefits, without proper comparison of the total cost of products, leading to costlier product choice (Rowe et al., 2015; CCP, 2017). By focusing the minds of customers on cashbacks, and the supposed personal and emotional benefits of such cashbacks, often through attractive television or internet advertising, banks engage in a form of negative nudging that may take advantage of low levels of financial literacy. Evidence exists on the effectiveness of marketing practices that use enticing terminology to obscure terms and conditions of the products (Caskey, 1994; Mendel, 2005; Bertrand et al., 2006).

The sophisticated and well research marketing campaigns by banks stands in contrast to the hands-off approach to information framing by regulators, who pursue a policy of mandatory disclosure. Disclosure policy is designed to achieve informed customers though mandatory disclosure of product attributes and conditions at the point of sale, and typically extend to a number of pages of dense text (Sunstein, 1998; Lacko and Pappalardo, 2010; Agarwal and Mazumder, 2013). The evidence on the effectiveness of current mandatory disclosures is weak. The randomised experiment conducted by Shu (2010) reveals that few participants were able to answer questions about future expected monthly payments when given information as per the Truth in Lending Act (TILA) disclosure in the US. Further, an assessment conducted by UK's Financial Services Authority in 2005 suggested that consumers do not read the Key Features Document (KFD); the document that explains the main points of a financial product. The FSA concluded that this may be due to factors such as; uncertainty regarding the exact role of KFD document, consumer perception that the KFD is boring, impenetrable and confusing, and consumer preferences for simple verbal advice (FSA, 2005).

In contrast, emerging research has shown that advanced well-designed disclosures, informed by behavioural economics, can help consumers towards better decision-making. Lacko and Pappalardo (2010) provide experimental evidence on the performance of a simplified prototype disclosure against the mandated disclosure under the guidelines of Truth in Lending Act (TILA) and Good Faith Estimate of Settlement Costs (GFE) in the US.[3] Individuals who were treated with a simplified prototype disclosure answered 70 percent of mortgage questions correctly, as compared to only 29 percent correct answers for participants with the TILA and GFE disclosure documents.

Employing choice experiments, the literature shows that behaviourally informed disclosures, often very simple, that are presented at the point of purchase affect consumer decision making. Bertrand and Morse (2011) suggests that cost of payday loans displayed in simple monetary terms reduced the take-up of payday loans by 10 percent. Hastings and Tejeda-Ashton (2008) found that presenting fees for consumers' public pension accounts in pesos instead of annual percentage rates allowed financially illiterate participants in Mexico to select funds with lower average fees. Agarwal et al. (2014) found, using a difference in difference design, that the US CARD Act requirement to disclose the interest savings from paying off balances in 36 months rather than only making minimum

[3]The TILA statement discloses annual percentage rate, finance charge, amount financed, total payments and payment schedule, charges for optional credit insurance, any late payment fees, and any pre-payment penalty that might apply. The GDE discloses several dozen individual settlement costs (Lacko and Pappalardo, 2010).

payments, improvement repayment.

In this paper, we conduct three parallel mortgage choice experiments on a representative online sample in Ireland. A total of 3,000 adults are surveyed, and we define an important subsample, prospective buyers, as those who declare themselves within 15 years of buying a house or taking out a mortgage. Compromising 1,135 respondents, this subsample is of particular interest from a regulatory policy perspective. In the first experiment the mortgage cashback is 2 percent at the point of drawdown. In the second experiment, the cashback is 2 percent at the point of drawdown, but the amount of deposit for no-cashback mortgage is adjusted downwards so that both mortgage choices in the experiment are effectively identical from a short-term liquidity perspective. In experiment three, the cashback is broken down into to 1 percent immediately and 1 percent 12 months after drawdown, again mirroring a product on the Irish mortgage market. The consumer's choice of hypothetical mortgages in the experiment allows us test the following hypotheses; (i) consumers suffer from behavioural biases (present bias, overconfidence, and riskiness) when choosing mortgages, (ii) limited attention bias increases the likelihood expensive mortgage is chosen, (iii) framing in marketing is effective, (iv) advanced disclosure alters consumer preferences, and (v) promotional marketing acts as a negative nudge in the choice of mortgages.

First, we examine the role of socioeconomic and behavioural factors in the choice of more expensive cashback mortgages. We find that consumers who are younger and less educated are more likely to choose a cashback mortgage. Behaviourally, we find robust evidence that consumers who suffer present bias are more likely to choose costly cashback mortgages.

Second, we find that consumers who demonstrate limited attention bias choose expensive cashback mortgage irrespective of the fact that immediate financial position of the consumer remains unaffected by opting the offer of cashback benefit. Third, we find that framing of one single cashback into two smaller cashbacks, with half delayed for one year increases the likelihood for the choice of cashback mortgage.[4] Further, we find that the likelihood of choosing a mortgage that offers a single larger cashback is higher for male consumers, but this reverses when two smaller cashbacks are offered against a single larger cashback.

Fourth, we find that an advanced financial disclosure that highlights the cost differential between products at the point of decision is effective in turning consumers away from costly cashback mortgages. This intervention mirrors the efforts of some price comparison websites to indicate directly the lowest cost option and present cost differential with the cheapest for each loan. We provide this information at the point of decision and term this an 'advanced disclosure' as it would take an upgrading of current disclosure regulation to force banks and mortgage brokers to provide a comparison table, either physically or electronically, of all products available. We believe our findings provide a

[4]This result holds for the analysis conducted on the full sample and sub-sample of *mortgage market* (respondents who have purchased/or are interested to purchase house/mortgage in +/-15 Years). However, the results do not hold for the subsample of *prospective buyers* (respondents who report to purchase house/mortgage in next 15 years). This can be atributed to small number of observations in the subsample to pick any significant impact.

rationale for regulators to engage in behaviourally informed advanced disclosure interventions.

Fifth, we find that very basic promotional marketing that highlights the cashback feature is effective at encouraging prospective house buyers into choosing cashback mortgages. We consider this a lower bound affect, as our text-based negative nudge simply cannot compete with expensive video-based advertising on television or the internet used by banks.

This paper contributes to the literature on consumer protection and advanced disclosure. Building on assessments of the effectiveness of first generation disclosure policy (e.g. TILA, GFE, KFD, etc.), this paper adds to the aforementioned literature on advanced disclosure (Lacko and Pappalardo, 2010; Bertrand and Morse, 2011; Shu, 2010). The study is also closely related to experiments testing the comprehensibility of information presentation and its impact on consumer choice (Hastings and Tejeda-Ashton, 2008; Seira et al., 2017; Anagol et al., 2017). Moreover, the effectiveness of advanced disclosure indicates that the mere availability of information under mandated disclosure does not guarantee informed decision making because psychological attributes and market competition deviate consumers from the neo-classical predictions of rational choice.

We contribute to empirical literature on the role of behavioural biases in the choice of financial products. Our results corroborate with the findings of Gathergood and Weber (2017); Agarwal et al. (2016) and Miles (2004), each of which highlight the role of present-bias in mortgage choice. Of particular interest is the similarity of our results with the findings of Gathergood and Weber (2017), where present-bias and financial literacy are recorded as key determinants for the choice of expensive Alternative Mortgage Products (AMP) in the UK. Further, our assessment of limited attention bias as a determinant of sub-optimal financial choice contributes to the literature on the limited processing power of consumers in making financial decisions, as highlighted in Hirshleifer and Teoh (2003); Brown et al. (2010); Einav et al. (2014); Gabaix and Laibson (2006) and Maines (1995).

Lastly, our findings contribute to the literature on financial stability. The financial crisis that began in the US in 2007 was, in part, caused by poor regulation of the mortgage market at the point of sale. Literature has documented how misaligned incentives and poor decision making played a key role for the sub-prime crisis in the US (Agarwal and Mazumder, 2013; Frydman and Camerer, 2016). While the central role of sub-prime mortgages in the US crisis is well established, mortgages sold in Greece, Ireland, Hungary, the Philippines, Mexico and Thailand played a role in undermining financial stability; each having average default rates between 2000 and 2014 of greater than 5 percent (Stanga et al., 2017). Irrespective of what lies behind the different default rates, and a different strand of the literature explores this very question, what is undeniable is that the financial stability of the household sector is directly linked to the overall stability of the financial system. In situations, were sizable portions of customers, and in this case customers with lower levels of financial capability, are unduly choosing higher priced mortgages, risk is being concentrated in certain mortgage types. In situations as in Canada, Ireland and the UK where some banks are offering only cashback mortgages, risk is being concentrated in certain, perhaps systemically important banks.

The remainder of this paper is organised as follows. In Section 2, we discuss the background

of cashback financial products in Ireland and elsewhere. In Section 3, we discuss the conceptual framework for the mechanisms behind mortgage choice and the role of behavioural biases. The study design and methodology is discussed in Section 4, and Section 5 reports the summary statistics obtained from the survey. The results of the study are discussed in Section 6, and the paper concludes in Section 7.

2 Background

2.1 Mortgages

Cashback features play a dominant role in the mortgage markets of Canada, Ireland and the United Kingdom.[5] Cashback benefits were a feature of 44 percent of mortgage products in Canada, 51 percent of mortgages in Ireland and 54 percent of mortgages in the UK.[6] In Canada, cashback benefits typically involved between 0.6 percent to 7 percent of the loan amount, while in Ireland cashback benefits typically involved 2 percent of the loan amount.[7] As compared to Canada and Ireland, cashback benefits were lower in the UK, ranging from £250 to £1,000; however, cashback offers have been rising between 2017 and 2018.

Analysis of mortgage rates in each country in the summer of 2018 showed that cashback mortgages are characterised by higher interest rates and higher total costs over the lifetime of the mortgage. We found that interest rates for cashback mortgages were on average 0.05 percent higher in Canada, 0.40 percent higher in Ireland and 0.20 percent higher in the UK. Figure 1 provides an overview of interest rates by mortgage type for the set of banks that make up over 80 percent of market share in Canada, Ireland and the UK, differentiated by whether the mortgage had a cashback feature. We present the interest rates for 60 percent loan-to-value (LTV) and 86 percent LTV for Ireland.

The interest rates charged leads to significantly higher overall costs for cashback mortgages. For a representative mortgage[8] in each country we found that the average cash back product was CAN $6,729 more expensive in Canada, €32,207 more expensive in Ireland, and £10,635 more expensive in the UK for the overall period of mortgage, as shown by the simple difference between the mean total amount payable between cashback and non-cashback mortgage (see Table 1).[9] The cost analysis for different categories of fixed rate mortgages provides further disaggregation of cost differential

[5] We did not find this feature in other markets although there was evidence of cashback mortgages in India offered by ICICI bank.

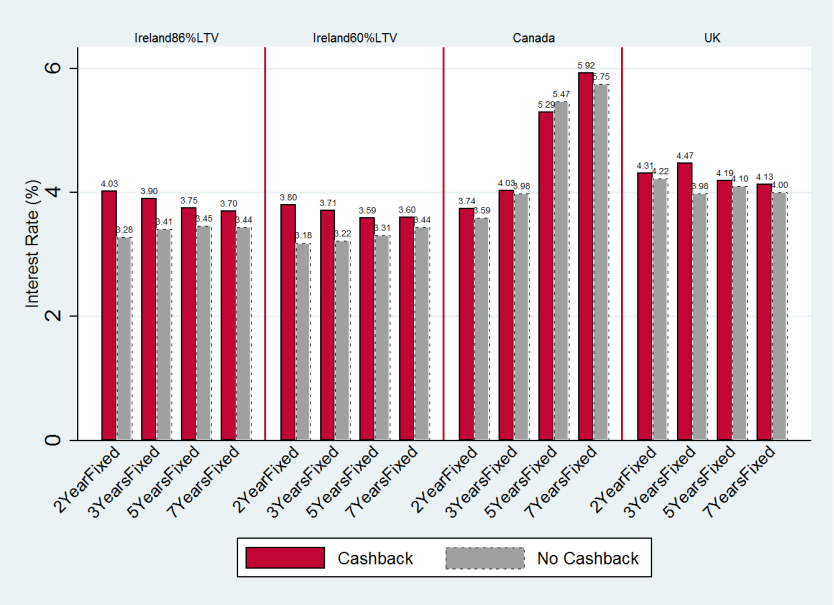
[6] A survey of products from Australia, Canada, Ireland, New Zealand, the UK and the US was conducted in the summer of 2018. Specifically, we surveyed six top banks in Canada, all banks in Ireland and thirteen top mortgage providers in the UK.

[7] Source: Author's recording of cashback features from bank websites during the summer of 2018.

[8] The representative mortgage in each country includes the average cost of mortgages across all types of mortgage products offered in the market (eg: 1 Year Fixed, 2 Year Fixed, etc.). The duration of these mortgages is 30 years and mortgage amount is 300,000 (LTV of 86 percent) in respective currencies for the countries considered.

[9] The numbers represent 86 percent Loan to Value for a loan of 300,000 in respective currencies over 30 years.

Figure 1: Mean interest rates for Cashback and non-Cashback products in Canada, Ireland and the UK



Source: Author's recording of cashback features from bank websites during the summer of 2018.

between cashback and non-cashback loans. As shown in Table 1, the mean difference can be as high as €54,615 for 1 year fixed rate loans in Ireland, £31,300 for 3 year fixed rate loans in the UK, and CAN $18,180 for 4 year fixed rate loans in Canada.

Moreover, the difference between the mean total amount payable for cashback and non-cashback mortgages, taking into account the current and net present value of cashback with mean lending rates to €25,500 and €21,262 for Ireland, and £10,260 and £9,974 for the UK respectively.[10] Our analysis shows that cashbacks play a different role in the Canadian mortgage market. In Canada, when the value of the cashback is taken into consideration, cashback mortgages are cheaper by CAN $6,390 and by CAN $17,908 when the net present value is used. While this suggests that cashbacks play a different role in Canada, it may not be surprising given that Canadian mortgage market is heavily dominated by cashback offers.

One-time cashbacks at drawdown are not the only rewards offered by banks. In Ireland, Permanent TSB offers 2 percent cashback on the monthly deposits until 2027, in addition to 2 percent cashback on the total amount of mortgage at drawdown. Further, Bank of Ireland (BOI) operates a loyalty scheme for its customers where BOI account holders receive 1 percent additional cashback at the end of five years. Other banks such as KBC and Ulster do not offer immediate cashback; though

[10]The net present value of cashbacks is calculated with average lending rates derived from the mean of mortgage interest rates for all categories in Canada, Ireland, and the UK available in July, 2018. For Ireland, the category of 'variable mortgages' was also used in the calculations (in addition to fixed rate categories of mortgage). The NPV of cashback represents the cost of loan if the same amount of loan as cashback is borrowed for 30 years.

Table 1: Cost Differential between Cashback and Non-cashback products in Canada, Ireland and the UK compiled by authors in the Summer of 2018

Country and Loan Attributes	**Simple Difference (No Cashback)**				**Difference Including cashback Benefits**	
Country	**Mortgage term**	**Mean Total Amount Payable (Cashback)**	**Mean Total Amount Payable (Non-Cashback)**	**Simple Difference**	**Difference including Cashback Benefits***	**Difference Including NPV of Cashback**
Average across All Mortgage Categories						
Canada	All Categories	$569,185.90	$562,457.10	$6,728.75	-$6,390.36	-$17,907.91
Ireland	All Categories	€511,675.81	€479,467.87	€32,207.96	€25,499.40	€21,262.17
UK	All Categories	£532,230.50	£521,595.70	£10,634.79	£10,259.74	£9,974.53
1 Year Fixed						
Canada	1 Year Fixed	$484,365.60	$479,649.10	$4,716.50	-$11,284.00	-$25,330.39
Ireland	1 Year Fixed	€520,333.10	€465,717.40	€54,615.72	€47,562.39	€42,985.59
UK	1 Year Fixed	NA	NA	NA	NA	NA
2 Year Fixed						
Canada	2 Year Fixed	$499,552.20	$487,542.30	$12,009.84	-$3,990.16	-$18,037.05
Ireland	2 Year Fixed	€517,341.10	€479,503.80	€37,837.34	€30,855.31	€26,324.83
UK	2 Year Fixed	£534,787.20	£528,135.40	£6,651.81	£6,225.25	£5,900.864
3 Year Fixed						
Canada	3 Year Fixed	$515,337.00	$514,606.10	$730.88	-$12,602.50	-$24,308.2
Ireland	3 Year Fixed	€512,441.70	€483,686.50	€28,755.22	€21,826.99	€17,331.75
UK	3 Year Fixed	£546,433.10	£515,132.80	£31,300.38	£30,944.13	£30,673.21
4 Year Fixed						
Canada	4 Year Fixed	$558,836.30	$540,655.90	$18,180.38	$7,680.38	-$1,537.895
Ireland	4 Year Fixed	€487,365.30	€480,320.40	€7,044.91	€1,044.91	-€2,848.40
UK	4 Year Fixed	NA	NA	NA	NA	NA
5 Year Fixed						
Canada	5 Year Fixed	$599,071.70	$615,929.60	-$16,857.90	-$28,857.90	-$39,393.04
Ireland	5 Year Fixed	€505,753.40	€483,475.10	€22,278.25	€15,338.21	€10,834.99
UK	5 Year Fixed	£528,811.00	£522,349.90	£6,461.06	£6,068.64	£5,770.21
7 Year Fixed						
Canada	7 Year Fixed	$642,187.40	$630,262.90	$11,924.50	-$75.50	-$10,610.67
Ireland	7 Year Fixed	-	€490,463.10	-	-	-
UK	7 Year Fixed	£525,012.60	£521,410.40	£3,602.13	£3,302.13	£3,073.98
10 Year Fixed						
Canada	10 Year Fixed	$684,951.00	$668,553.90	$16,397.06	$4,397.06	-$6,138.10
Ireland	10 Year Fixed	€514,341.30	€484,143.5	€30,197.84	€24,197.84	€20,304.54
UK	10 Year Fixed	£526,108.40	£520,949.80	£5,158.56	£4,758.56	£4,454.38
Variable Interest Rates						
Canada**	Variable	NA	NA	NA	NA	NA
Ireland	Variable	€524,154.80	€479,428.40	€44,726.41	€37,670.13	€33,901.88
UK***	Variable	NA	NA	NA	NA	NA

Canadian Figures are in Canadian Dollar (CAN $)
*: Any small benefits offered with non-cashback mortgages are not included. If included, this would lead to cashback products being even less attractive.
**: All cashback mortgages in Canada were fixed term mortgages.
***: As only one variable mortgage product offered cashback in the UK, the comparison was deemed invalid

provide benefits such as legal fees and home insurance. Table 2 describes the full set of mortgage offers in Ireland in the summer of 2018, where three banks (BOI, PTSB, EBS) offer cashbacks on their mortgages and three do not (KBC, Ulster, and AIB).

Table 2 illustrates that Banks that do not engage in cashback mortgages do offer other smaller benefits. For a €300,000 mortgage with 2 percent cashback the consumer receives €6,000 in cash at drawdown, and this compares to possible benefits in the range of €1,500 to €3,000 for some of the other banks.

Table 2: Mortgage Options in Ireland, Summer 2018

Bank	**Mortgages in Ireland, Summer 2018**
	Cashback
BOI	2% Immediately and 1% at the end of 5 years +€2,000 interest top-up on Savings (Only for FTBs)
EBS	2% cashback.
PTSB	2% Immediately +2% on monthly cashback on payments every month until 2027
	No-Cashback
Ulster Bank	€1,500 towards the legal fees.
KBC	No immediate cashback. €3,000 towards the legal fees and 50% off on Home Insurance for 1 Year (new residential mortgages)
AIB	No cashback for buyers. €2,000 bonus for switching your mortgage.

Regulatory authorities have raised concerns about cashback mortgages.[11] However, initial concerns have focused on the potential for using cashbacks to circumvent loan-to-value guidelines. In Canada, the office of Superintendent of the Financial Institutions (OSFI) warned in 2017 that cashbacks should not be considered as part of down payment, recommending that mortgage default insurers should not underwrite loans that use cash back for a down payment. In Ireland, when cashbacks emerged in the market in 2015, the first concern of the Central Bank was whether banks were turning to cashbacks to help customers overcome the new limits on LTV ratios.

Concern has been expressed in the UK about consumer inability to choose the lowest cost mortgages when subjected to marketing about cashback mortgages. In a review of the mortgage market in 2015, the UK Financial Conduct Authority (FCA) suggested that such is consumer appetite for cashbacks and rewards that many consumers were willing to consider mortgage products without understanding the full cost of the mortgage (Rowe et al., 2015).

In 2017 a report commissioned by the Irish Competition and Consumer Protection Commission (CCPC) argued that consumers cannot properly assess mortgage product and often make poor choices, an issue exacerbated by the introduction of additional elements such as up-front cashback offers and loyalty discounts (CCP, 2017). Despite calls within political circles in Ireland to ban cashback mortgages, the furthest regulators have gone is the tightening up of the marketing rules around cashback mortgages.

It is possible that sophisticated consumers choose cashback mortgages before switching to other

[11] Our research found multiple mentions of concerns on the impact of cashback mortgages on consumers in the media in Canada, Ireland and the UK.

products when their contract allows. While we cannot rule out this strategic behaviour, we have reasons to believe that this phenomenon is likely to be very small. First, households that choose a cashback mortgage have lower levels of financial literacy and lower levels of attention. Second, very few Irish households switch mortgages; the Market Monitoring Survey 2015 from the European Commission[12] showed that 3.3 per cent of mortgage holders in Ireland switched their mortgage in 2014. Third, and related to the previous point, levels of mortgage switching are more likely motivated by notable differences in new advertised interest rates, often within the same bank, that do not automatically apply to existing mortgages.

In our data we find that around 27 percent respondents stated their willingness to change mortgage in first two years. However, willingness to change mortgage was uncorrelated with the choice of cashback. Furthermore, there is a significant and positive correlation between willingness to change mortgage and desire to avoid paperwork related to household bills. This indicates that although there is a preference for changing mortgage in first two years for some respondents, the level of subsequent switching may be less significant.

2.2 Credit Cards

We examined credit card markets in six countries, focusing on credit cards from banks that enjoyed between 80 and 90 percent of the total market, and found a similar pattern of more expensive products with cashback features in most of the countries we looked at. Cards were deemed to have a cashback feature if they offer cashback as a percentage of purchases or points that can be used to redeem cash. All other cards including cards that offered points redeemable on airlines or for hotel groups are included in the non-cashback category. Interest rates were higher for cash back credit cards in Australia (1.34% higher)[13], Canada (1.42% higher), New Zealand (4.24% higher) and the UK (3.92% higher). The US is the exception to the rule, with cashback credit cards slightly cheaper than non-cashback cards. Bank-customer relationships in the US are much more hierarchal than in other countries with more and more benefits, including lower interest rates, offered to credit worthy high-end clients (see Figure 2)[14]

Cashback credit cards raise a concern for consumer protection as one of the hidden agendas for banks is to encourage consumers to spend more on purchases, often leading to excessive and addictive spending.[15] For a particular cashback credit card in the US, it was found that for an average cashback benefit of $25, the average card spending increased by $68 per month for the first quarter the cashback

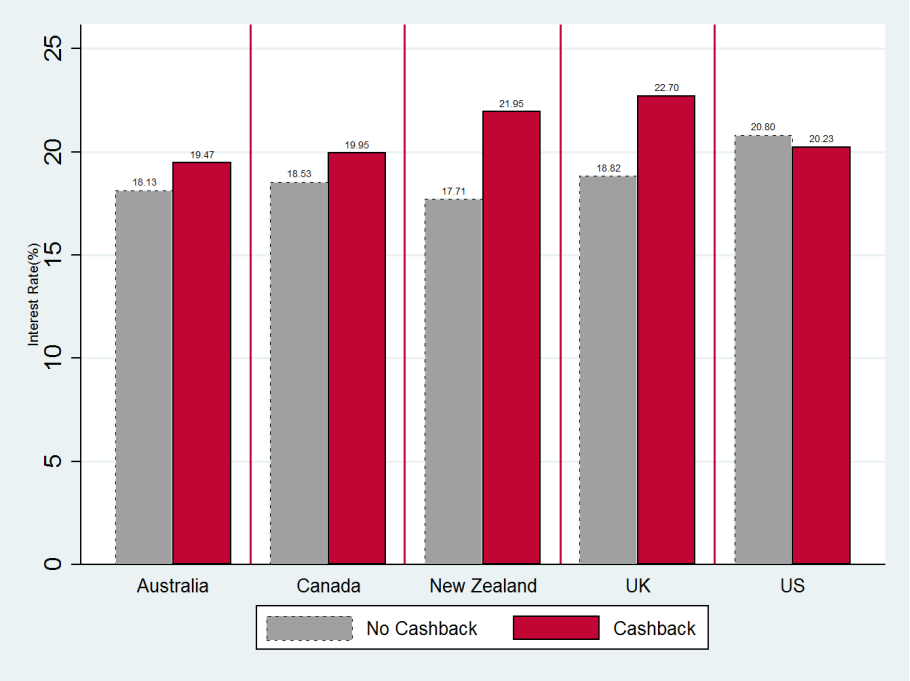
[12] 2015 Consumer Market Monitoring Survey Report. Retrieved from: http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/market_monitoring/index_en.htm

[13] Australian rewards cards use a points system whereby points are rewarded when the card is used on eligible purchases. Depending on the card, you can redeem the points for items such as travel and shopping discounts, gift cards as well as cash. Other cards offer cashback as a percentage of your spending, in the same manner as the rest of the countries do.

[14] Are elite Cards worth it? by Tony Mecia, published in creditcards.com on August, 21, 2016. Retrieved from: https://www.creditcards.com/credit-card-news/elite-credit-cards-1277.php.

[15] 'Think About It: Why Would The Credit Card Company Give You Cash Back?' by Jim Wang. Retrieved from: https://www.businessinsider.com/are-cash-back-credit-cards-worth-it-2012-1?IR=T

Figure 2: Mean interest rates for Cashback and non-Cashback Credit cards in selected Countries



Source: Author's recording of cashback features from bank websites during the summer of 2018.

programme was introduced. As a consequence the average level of debt on cards increased by $115 (Agarwal et al., 2010).[16] Furthermore, the increase in mean spending and debt on cashback credit cards was persistent in the long-run, averaging around $67 and $197, per month over the nine month period after the introduction of cashback cards.

3 Theories of Mortgage Choice

3.1 Classical Economic Theory

The standard expected utility model assumes that rational consumers evaluate all options available in the market and choose an option that results in the lowest overall cost. The implication of this assumption in the housing mortgage market is that firms, aware of consumer rationality, will compete to provide more and more low-cost mortgages that shall increase competition and drive out bad options, thus improving overall welfare. A rational consumer will then choose mortgage 'x', where we assume that the preferences of a consumer can be represented by a time-separable intertemporal utility function '$U(.)$'. This implies that the utility function is additive for '$t = 0, 1, 2, 3, \ldots, T$', as shown in Equation 2.

[16] Agarwal et al. (2010) used a proprietary account-level data, taken from a large US financial institution that issues credit cards nationally (name not disclosed).

Equation 1 shows the utility function in time period '*t=0*', where 'v' is instantaneous utility a person gets from choosing mortgage 'x', and '$d(t)$' is the discount factor being 1 for time period '$t = 0$', representing time consistency in preferences (O'Donoghue and Rabin, 2001).

$$U(v) = v(x).d(t) \quad \text{where} \quad d(t) = 1 \quad \text{for} \quad t = 0 \tag{1}$$

Of course, an inter-temporally maximising consumer has "time consistent" impatience, prioritising access to money in the short run, thus discounting future consumption with standard discount rate 'δ', where '$0 < \delta < 1$'. In this case, the discount rate ('δ') devalues all future events ('$t > 0$') relative to the present ('$t = 0$'), as shown in the one-parameter exponential-discounting model in Equation 2.

$$U^t(v_t) = \sum_{t=0}^{T} v_t(x).\delta^t \quad \text{where} \quad d(t) = \delta^t \quad \text{for} \quad t > 0 \tag{2}$$

3.2 Behavioural Economic Theory

The era of behavioural economics has taught us that consumers do not necessarily act rationally (as shown in Equation 1 and 2). There may be a range of behavioural biases that affect the decision making of customers, leading them to choose products that may not represent the lowest cost option. The chances that behavioural biases play a key role in decision making is increased by the fact that many people tend to get lost in overwhelming amount of market options (Thaler, 1985; Barr et al., 2008; Estelami, 2001) and are influenced by well thought out marketing campaigns designed to distract customers from rational comparison of products. Understanding these tendencies, banks often engage in confusing marketing practices to reap benefits of the false beliefs and poor understanding of borrowers (Bertrand et al., 2006). In this paper, we consider four behavioural factors; present bias, overconfidence and riskiness, tunnelling and heuristics, and inattention.

Present Bias

Most people will have positive discount rates, valuing more highly goods or money today than in the future. While acknowledging the existence of a continuum with no obvious threshold point for intertemporally 'normal' consumers, the more extreme version of this phenomenon can be termed present bias. A number of studies show that present bias phenomenon leads to higher credit card borrowings (Laibson, 1997; Fehr, 2002; Meier and Sprenger, 2007; Heidhues and Kőszegi, 2010).

For mortgages, present-bias leads to the choice of expensive products that offer short-term benefits at the expense of long-run costs. This is demonstrated in the experiment conducted by Gathergood and Weber (2017) where present-bias is found to dominate the choice of expensive Alternative Mortgage Products (AMP) with back-loaded payments. The choice of AMP is attractive to consumers because one of the key features of AMP is that initial payments are small, thus allowing higher consumption in the short-run. Further, Miles (2004) suggests disproportionate focus of consumers on the initial loan costs, as one of the reasons for the popularity of Adjustable Rate Mortgages (ARM)

in the UK.[17] In our context, consumer myopia due to present-bias in mortgage market may explain the choice of high-interest cashback mortgage products, where consumers find immediate upfront cash-bonuses more attractive. This is suggested by the findings of CCPC (2017) and Rowe et al. (2015) on consumer preference for cashback mortgage products in Ireland and the UK.

Overconfidence and Riskiness

Individuals who are overly optimistic and confident about the future, either regarding their own susceptibility to risk, or future income streams, are said to have overconfidence. Overconfidence leads people to systematically underestimate the likelihood of suffering an adverse event (Kilborn, 2005). In the literature of finance, over-confidence is described partly as a result of "better than average effect", where people have unrealistic views about themselves that they are better than the rest (Glaser and Weber, 2007). This is closely related to risk-attitudes when individuals tend to take more risk as a result of the confidence in their own performance, as shown by Murad et al. (2016). Over-confident investors underestimate the variance of the risky assets, as shown in the over-confidence modelling of investors by Benos (1998); Kyle and Wang (1997) and Wang (2009).[18]

The implications of over-confidence and riskiness extend beyond the financial markets and affect consumer decision making. Grubb (2015) highlights that banks naturally prefer consumers to over-value contracts and therefore react by introducing complicated pricing features- one of the key aspects employed in the marketing of expensive cashback mortgages. Likewise, the focus group discussion conducted by Lacko and Pappalardo (2007) showed that many borrowers were optimistic that they had selected good mortgages but became less happy when they understood their mortgages more fully.[19] Bucks and Pence (2008) show that in the case of ARMs, borrowers underestimate the extent to which the interest rates can increase, thus disposing them to believe that they are unlikely to experience bad financial events as a result of interest rate hikes in the future.

Heuristics (Tunelling)

Gigerenzer and Gaissmaier (2011) define heuristics as a strategy that ignores part of the information with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods. As a result, consumers tend to use some simplifying heuristics or rules of thumbs in their decision rather than extensive algorithm processing (Gilovich et al., 2002).

Heuristic decision making by consumers have been found to be influenced by decision-making

[17] Time inconsistency also explains consumer choices in the mortgage markets where present-bias consumers are associated with higher rate of defaults (Agarwal et al., 2016), while consumers who are more likely to delay immediate rewards are associated with higher credit-worthiness (Meier and Sprenger, 2010).

[18] These phenomena explain financial activities such as over-trading, greater trading costs, and riskiness in the stock market (Odean, 1999)

[19] Other examples include, the seminal study by Svenson (1981) finds that 82 percent of a group of students in the US and Sweden ranked themselves amongst the 30 percent drivers with highest driving safety, indicating strong tendency to believe that they are highly skilled. In another study by Lusardi and Mitchell (2007) over 16 percent of respondents who subjectively assessed their own financial literacy in the top quartile tested in the bottom quartile.

complexity (Bettman and Park, 1980; Johnson et al., 1989; Payne et al., 1988), time pressure (Johar et al., 1997; Payne et al., 1988), and product knowledge and experience (Johar et al., 1997; Green et al., 1977). In the credit market, heuristics lead consumers to often use linear function of deposit and monthly payments when making loan choices, without calculating the product of monthly payments and number of payments, or using discounted values (Herrmann and Wricke, 1998). Homburg et al. (2014) shows that price complexity negatively affects consumer perceptions of price fairness due to increase in cognitive burden caused by complex prices. Thus, consumers in certain situations do not invest much effort in evaluating total costs and directly apply heuristics to infer high cost from more complex prices as a rule of thumb (Carlson and Weathers, 2008).

In addition to heuristic decision making, borrowers lead themselves into the practice of 'tunnelling' and pick the most striking attribute of a loan that leads to sub-optimal outcomes in the long-run.[20] Shafir and Mullainathan (2013) document how tunnelling can lead to debt-traps for consumers from an experiment on low-income traders in India. The phenomena of tunnelling can occur in mortgage market when consumers put too much focus on finalising a house such that it distracts or inhibits them to process mortgage related information, and a loan appears just an obstacle to overcome as quickly as possible (Perry and Blumenthal, 2012; Perry and Lee, 2012).

Inattention

There is growing evidence on the role played by inattention in consumer decision making. Evidence suggests that consumers fail to weigh non-salient information such as eBay shipping fees (Brown et al., 2010; Einav et al., 2014), hidden fees of a product (Gabaix and Laibson, 2006), and demonstrate inattention to the commodity taxes not included in the posted prices (Chetty et al., 2009).

Inattention can be explained as a consequence of two distinct cognitive processes; first, the process which executes quickly with little conscious deliberation; and second, the process which is slower and more reflective (Sloman, 1996; Frederick, 2005; Kahneman and Frederick, 2002). These two processes have generally become known as "System 1" and "System 2" processes, a terminology first suggested by Stanovich and West (2000). Frederick (2005) developed the Cognitive Reflection Test (CRT) to distinguish between these two processes. CRT results have been found to be significantly related to maximising strategies on probabilistic prediction tasks, endorsement of profit maximising strategies, and performance calibration (Liberali et al., 2012; Mata et al., 2013; Pennycook et al., 2012).

These behavioural biases can be represented in our utility equation by transforming the one-parameter exponential-discounting model (as shown in Equation 2 with parameter 'δ') with two parameters, as explained under quasi-hyperbolic time-discounting function (QTD) by O'Donoghue and Rabin (2001). The two parameter QTD utility function is shown in Equations 3, where in addition to "time consistent" discount rate ('δ'), there exists a second parameter 'β' which represents

[20] Tunnelling as defined by Mazer et al. (2014) is a situation when a single need becomes so important that an individual focuses disproportionate amount of attention on addressing one issue, at the expense of other related issues.

"time-inconsistent" preference for immediate gratification. For '$\beta < 1$', at any given moment the person has an "extra bias" for now over future and therefore the model generates a conflict between earlier and later selves. In simple words, β can be considered a measure of present bias affecting the intertemporal utility maximisation of consumer (Atlas et al., 2017).

We further modify the QTD utility function by adding two more parameters 'b' and 'z'. The parameter 'b' represents other behavioural biases such as overconfidence, riskiness, heuristics, inattention or tunnelling that affect consumer utility U, and 'z' represents "information" which can affect consumer utility either positively or negatively, depending on the nature of information (welfare enhancing disclosure or misleading marketing practise).

$$U^t(v_t) = \sum_{t=0}^{T} v_t(x, b, z).\beta\delta^t \quad \text{where} \quad d(t) = \beta\delta^t \quad \text{for} \quad t > 0 \tag{3}$$

Role of Marketing

Marketing campaigns encourage consumers towards sub-optimal and costly products ranging from alcohol, predatory mortgages, high-interest credit-cards, pay-day loans, rent-to-own, and several other fringe banking schemes (Mendel, 2005; Caskey, 1994; Bertrand et al., 2006). Sunstein et al. (2016) points to manipulation by private banks with evidence of deception, often where people are treated as uninformed puppets (Wilkinson, 2013). Conversely, less effort has been made to promote superior options; a discrepancy explained by Bertrand et al. (2006) often as a result of differences in market power.

For mortgages, the manipulation manifests through clever marketing, distraction, and lack of transparency from lenders through initial teaser rates, extended loan maturities, balloon clauses, adjustable rates, and cashbacks (McCoy, 2005; Rowe et al., 2015). A particular example of manipulation is a type of framing where banks offer two discrete discounts instead of one, even if both approaches are financially equivalent.[21] This allows predatory marketing to tunnel consumer's attention on product attributes to the advantage of the bank.

4 Experiment, Data, and Methodology

4.1 Experiment Design

Our research involves three distinct, but related, experiments. Each experiment involves an advanced disclosure treatment and a marketing negative nudge treatment, as well as a control group. In notation it can be described as a $(1 + 2) * 3$ design. In each experiment, respondents choose between a high

[21] Differentiating Discounts by Alain Samson in Psychology Today, published on September 10, 2012. Retrieved from: https://www.psychologytoday.com/us/blog/consumed/201209/differentiating-discounts

cost cashback mortgage and a lower cost non-cashback mortgage. The particulars of each mortgage can be considered representative of options on the Irish mortgage market in the summer of 2018.

The cashback product we use is €30,101 more expensive for the term of 30 years. We consider it economically rational, for customers with typical discount rates, to choose the loan product with the lowest cost. The possible exception to this is from consumers who are particularly liquidity constrained in the short term and are confident about their long-term financial future. We control for this in our experiment by capturing information on the self-perceived level of cash-constrain, income-category, and socio-economic status.

In the first experiment the cashback is 2 percent at the point of drawdown. In the second experiment, the cashback is 2 percent at the point of drawdown, but the amount of deposit for the non-cashback mortgage is adjusted downwards so that both mortgage choices in experiment two are effectively identical from a short-term liquidity perspective. In experiment three, the cashback is broken down into 1 percent immediately and 1 percent 12 months after drawdown, again mirroring a product on the Irish mortgage market. All mortgage options are based on a mortgage amount of €300,000 for 30 years and a property value of €350,000.

Figure 3 outlines the nature of our experiment and the underlying behavioural biases that can be captured from each experiment to address the following hypotheses.[22]

Hypothesis 1: Consumers suffer from behavioural biases (present bias, overconfidence, and riskiness) when choosing mortgages.

Hypothesis 2: Limited attention bias increases the likelihood of choosing expensive mortgage.

Hypothesis 3: Framing in marketing is effective for the choice of expensive mortgage.

Hypothesis 4: Advanced financial disclosure alters consumer preferences for mortgages in a positive way.

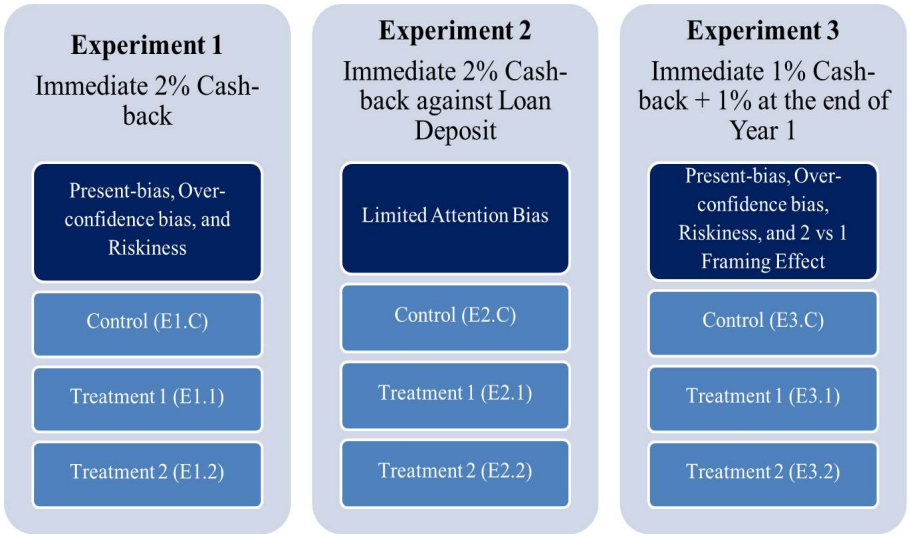
Hypothesis 5: Promotional marketing acts as a negative nudge in the choice of mortgages.

Experiment 1

In experiment 1, the cashback mortgage A provides 2 percent cashback (€6,000), while the alternative low-cost non-cashback mortgage B has no cashback feature. Both mortgage options have deposits of €50,000 (86% loan to value – LTV). The mortgages normally differ on other characteristics such as interest rates, monthly payment, and the total amount repayable; all of which are higher for the cashback mortgage. The mortgage options presented in experiment 1 are shown in Figure 4. The ordering of the loan attributes was designed to mirror how price comparison web-

[22]In each experiment mortgage option A is consistently the high-cost cashback mortgage, while B is always a low-cost non-cashback mortgage. Survey respondents are presented these choices and were urged to devote some time considering their preference.

Figure 3: Design of the Experiment



sites present loan information to consumers. The control represents the situation where a consumer chooses between mortgage options with information at hand as mandated under Irish Banking disclosure regulations. The respondent's choice in the control group of Experiment 1 (arm E1.C) allows us to test hypothesis 1.

Figure 4: Mortgage options for Control Group in Experiment 1 (E1.C)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back (€)	€6,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000
Total Amount Repayable (€)	€498,939	€468,838

Following piloting on Amazon M-Turk, we settled on an evidence-based form of advanced disclosure treatment. First, we highlighted in the first row the total cost of each loan product. Second, we added in an additional row clearly specifying the cost differential between the lowest cost product and the more expensive product.[23] Many price comparison websites across a number of countries provide this explicit comparison for car insurance and internet/TV bundles, often with a function for ranking by total cost. Although most mortgage price comparison websites only record the total

[23]This simplification of disclosure with context to mortgages relates to the "channel factors" which are minor situational changes but can have large impact. Coined by Lewin et al. (1951), the term "channel factors" relates to certain behaviours that may be triggered by opening up a channel. At the same time certain behaviours can be blocked by closing a channel (Barr et al., 2008).

amount repayable without either the cost differential being made explicit or a function for ranking, this functionality could easily be included. The advanced disclosure treatment for experiment 1 (arm E1.1) is shown in Figure 5.

Figure 5: Mortgage options for Treatment 1 in Experiment 1 (arm E1.1)

Price of House: €350,000	**Option A**	**Option B**
Total Amount Repayable (€)	**€498,939**	**€468,838**
Cost Difference (€)	**+€30,101**	**Lowest Cost**
Immediate Cash-Back (€)	€6,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000

For our marketing or negative nudge treatment, we took inspiration directly from the marketing of banks in Ireland who used emotive imagery and video focused on enjoying life with a cashback benefit. Our message imbedded in row two of the list of mortgage attributes reads "*Option A Bonus: Benefit Immediately from €6,000 cash in your pocket and like many others continue to enjoy the things you love.*" We acknowledge that our attempt to influence consumers would not win any marketing industry prizes, although we did test different messages on Amazon M-Turk, and as a result we can interpret any treatment affect as a lower bound of the possible effects of more sophisticated marketing. Treatment 2 in experiment 1 (arm E1.2) is shown in Figure 6.

Figure 6: Mortgage options for Treatment 2 in Experiment 1 (arm E1.2)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back	€6,000	€0
Option A Bonus: Benefit immediately from €6,000 cash in your pocket and like many others continue to enjoy the things you love.		
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000
Total Amount Repayable (€)	€498,939	€468,838

Experiment 2

The underlying loan products are the same in experiment 2 but with one exception. The deposit payment in option B reduces from €50,000 to €44,000, increasing the loan amount from €300,000 to €306,000.

This modification allows us to capture the limited attention of consumers (hypothesis 2). At the

Figure 7: Mortgage options for Control Group in Experiment 2 (arm E2.C)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back (€)	€6,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€306,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,328
Deposit (€)	€50,000	€44,000
Total Amount Repayable (€)	€498,939	€478,215

Figure 8: Mortgage options for Treatment 1 in Experiment 2 (arm E2.1)

Price of House: €350,000	**Option A**	**Option B**
Total Amount Repayable (€)	**€498,939**	**€478,215**
Cost Difference (€)	**+€20,724**	**Lowest Cost**
Immediate Cash-Back (€)	€6,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€306,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,328
Deposit (€)	€50,000	€44,000

Figure 9: Mortgage options for Treatment 2 in Experiment 2 (arm E2.2)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back	€6,000	€0
Option A Bonus: Benefit immediately from €6,000 cash in your pocket and like many others continue to enjoy the things you love.		
Term (Years)	30	30
Loan Amount (€)	€300,000	€306,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,328
Deposit (€)	€50,000	€44,000
Total Amount Repayable (€)	€498,939	€478,215

point of drawdown, the two products are financially equivalent, so choice of cashback cannot be attributed to present bias, over-confidence or an appetite for taking risk. The mortgage options presented to respondents in the control group of experiment 2 (arm E2.C) are shown in Figure 7. Treatment 1 and treatment 2 for the second experiment (arms E2.1 and E2.2) follow the same structure as in experiment 1 and are shown in Figure 8 and 9 respectively.

Experiment 3

Finally, for experiment 3, we examine the impact of dividing up the cashback into discrete units reflecting a marginal change in the cashback amount, in present value terms, of mortgage A. Mirroring the marketing strategies of certain banks, the one-time immediate cashback of €6,000 from previous experiments is split into two smaller cashbacks of €3,000 each, paid at drawdown and at the end of year 1.

Figure 10: Mortgage options for Control Group in Experiment 3 (arm E3.C)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back (€)	€3,000	€0
End of Year Cash-Back (€)	€3,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000
Total Amount Repayable (€)	€498,939	€468,838

Figure 11: Mortgage options for Treatment 1 in Experiment 3 (arm E3.1)

Price of House: €350,000	**Option A**	**Option B**
Total Amount Repayable (€)	**€498,939**	**€468,838**
Cost Difference (€)	**+€30,101**	**Lowest Cost**
Immediate Cash-Back (€)	€3,000	€0
End of Year Cash-Back (€)	€3,000	€0
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000

The split of cashback in experiment 3 is done to capture the 2 versus 1 framing effect with the hypothesis that two cashbacks appear more atractive and appealing than having just one, irrespective of being financially equivalent or indeed less attractive in the presence of a positive discount rate (hypothesis 3). Further, responses for experiment 3 are pooled with experiment 1 to test hypothesis 1. The images for the control (arm E3.C), treatment 1 (arm E3.1), and treatment 2 (arm E3.2) are shown in Figure 10, 11, and 12 respectively.

Figure 12: Mortgage options for Treatment 2 in Experiment 3 (arm E3.2)

Price of House: €350,000	**Option A**	**Option B**
Immediate Cash-Back	€3,000	€0
End of Year Cash-Back	€3,000	€0
Option A Bonus: Benefit immediately from €3,000 in cash plus €3,000 at the end of Year 1 and like many others continue to enjoy the things you love.		
Term (Years)	30	30
Loan Amount (€)	€300,000	€300,000
Interest Rate	3.73%	3.23%
Monthly Payments (€)	€1,385	€1,302
Deposit (€)	€50,000	€50,000
Total Amount Repayable (€)	€498,939	€468,838

4.2 Data

The experiment is implemented through a nationally representative online survey of 3,000 adults randomly chosen using interlocking quotas for age, gender, social class and region, from a panel of 60,000 individuals. The panel was developed through open enrolment and by invitation only recruitment campaigns with a special effort made, such as behavioural and attitudinal profiling, to include hard-to-reach population segments. Each of our nine experiment arms, containing approximately 333 respondents are representative for social class classification.

We ask respondents about their housing and mortgage history as well as their future plans. 37.23 percent of the sample is interested in taking out a mortgage in the next 15 years, with 44.97 percent planning on purchasing a house in the same period. These percentages fall to 17.97 percent for a mortgage and 23 percent for purchasing a house in the next five years. For this study we focus on three distinct samples as follows; a) all respondents (100%), b) within plus or minus 15 years of a house or mortgage purchase (65.55%), a group we term *the mortgage market*, and c) prospective consumers planning on buying a house or taking out a mortgage in the next 15 years (46.5%), a group we term *prospective buyers*. An argument could be made to focus on those consumers thinking of taking out a mortgage in the next 5 years, but we were unable to get to this level of analysis due to small sample size.

In addition to their choice of mortgage product, our online survey recorded information on demographic variables such as gender, education, monthly household income, and employment status. We captured information on the financial position of the household with questions such as the proportion of income that respondents are able to save, the degree to which they are cash-constrained, what financial obligations they faced in the next two years, number of loans, expectations around inherited income, and credit card repayment behaviour. We also ask questions related to their attitudes regarding financial planning, spending, and purchase decisions.

We capture behavioural biases through a series of questions that are directly related to present bias, riskiness, over-confidence, and limited attention. We identify present-bias by constructing a scale 1

to 5 for capturing patience, where choice 1 applies to '*Very Impatient*' and choice 5 is '*Very Patient*'. Although self-perceived measures are frequently used in experimental studies, we are conscious of the reporting biases associated with such responses. In order to limit this issue, we also captured present-bias through revealed preference measure of Individual Discount Factor (IDF) using the approach similar to Meier and Sprenger (2010).[24] As an illustrative example, if an individual prefers €90 today as compared to €100 in a month, but prefers €100 in one month over €85 today, then we take €90 as the switching point and calculate the monthly IDF as $(90/100)^1 \approx 0.90$. Present bias is derived from the IDF in two price lists by comparing dynamic inconsistency of individuals across the two-time frames; (i) immediate reward versus reward after one month, and (ii) reward after 3 months versus reward after 4 months. The principle of dynamic inconsistency implies that an individual suffers present bias if he is less patient (lower IDF) for a smaller earlier payment in the present ($t = 0$). Thus, we classify an individual suffering from present bias if $IDF_{0,1} < IDF_{3,4}$.

For riskiness, the respondents' willingness to accept risks in financial decisions is derived using self-perceived measure on a scale from 1 to 5, where option 1 was '*Not willing to take any financial risk*' and option 5 was '*Take substantial financial risk expecting to earn substantial returns*'. Once again, we obtain a revealed preference measure of financial riskiness by asking the preference of individuals amongst the following options; first, a guaranteed payment of €50 and second, a 10 percent chance of winning €750. Further, we also ask for the respondent's willingness to pay for a lottery that offers 10 percent chance of winning €200.

Closely related to riskiness is over-confidence bias that is captured by series of questions in which respondents answer by entering a numeric range.[25] After recording these ranges as answers, we derive the proxy of over-confidence by a follow-up question that asks respondents to state the number of questions which they were confident of having answered correctly. The measurement of confidence based on range estimates has been widely used in the literature (Soll and Klayman, 2004; Russo and Schoemaker, 1992; Teigen and JØrgensen, 2005).

Finally, we capture limited attention bias by providing cognitive reflection test (CRT) to the respondents, described first by psychologist Shane Fredrick in 2005. Cognitive reflection test emphasizes the distinction between two cognitive biases; first, those executed quickly with little conscious

[24] Respondents are given two price-lists where they decide to choose between a smaller reward (€X) in period 't' and a larger reward (€Y>€Y) in period 'τ'. In the first price-list, 't' is the present ($t = 0$) and 'τ' is one month ('$\tau = 1$'), while in price list 2 't' is three months from the present ($t = 3$) and 'τ' is four months from the present ('$\tau = 4$'). The delay 'δ' is one month in both price-lists and the value for Y is fixed at €100 and the value for X varies from €95 to €60. The individual discount factor (IDF) is measured by observing the point given in the price list X^* where the individual switches from opting for the smaller, earlier payment to larger, later payment. This implies that the discount factor is taken from the last point where the individual would prefer an earlier, smaller payment, assuming $X^* \approx IDF^{\delta} * Y$, where $\delta = 1$.

[25] The four questions that we ask in the survey are: Question1: I am 90% sure that the population of the World in 2016 (in billions) is between A and B billions. Question 2: I am 90% sure that the population of European Union in 2016 (in millions) is between A and B million. Question 3: I am 90% sure that the distance between Dublin and Sydney (in km) is between A and B km. Please input your response for A (lower estimate) and B (higher estimate) (numbers only) Question 4: I am 90% sure that the shortest distance (as the crow flies) between the Republic of Ireland and Wales in km is between A (lower estimate) and B (higher estimate) square kms.

deliberation, and second, those that are slower and more reflective (Kahneman and Frederick, 2002; Frederick, 2005). The CRT questions developed by Frederick (2005) are:

Question 1: If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

Question 2: A Hurley and a Sliotar cost €1.10 in total. The Hurley costs €1.00 more than the Sliotar. How much does the Sliotar cost?[26]

Question 3: In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

The intuitive answers that spring quickly under S1 (process that executes quickly) are 100 minutes, 10 cents, and 24 days, which was confirmed by a study done in Princeton, as mentioned in Frederick (2005).[27] Thus respondents answering CRT questions correctly are designated as attentive and we derive an index of attentiveness by adding the number of correct responses.

In addition to these behavioural biases, we also capture debt-use by asking respondents if they would like to purchase a mobile phone/tablet by (i) using an option of loan at the interest rate of 3 percent for 12 months, or (ii) accumulate enough savings in next 6 months to pay for the device. Lastly, we also capture financial literacy of respondents by asking two questions that involve some knowledge of borrowings, similar to Gathergood and Weber (2017). We weigh the responses for each question as 0.50 and derive index of financial literacy as the sum of the correct weighted responses (taking the value as 1 and zero otherwise). The financial literacy questions are as follows:

Question 1: Suppose a 10-year mortgage and a 20-year mortgage have the same Annual Percentage Rate, and the same borrowed amount. The total amount repaid will be: a) Higher for the 10-year mortgage, b) Higher for the 20 year mortgage, c) The total amount repaid will be the same for both mortgages, d) Can't Say.

Question 2: Suppose you owe €100,000 in a mortgage at Annual Percentage Rate of 5%. If you didn't make any payment on this mortgage, how much would you owe in total after 5 years? a) Less than €120,000, b) Between €120,000 and €125,000, c) More than €125,000, d) Can't Say.

To confirm the success of our randomisation process, Table 3 presents the p-values from the difference of means t-test. The results confirm that there is no significant difference between the participants in control, treatment 1, and treatment 2 arms for no more variables than we would randomly expect. Thus, it can be deduced that the random allocation of participants in survey arms was successful in terms of obtaining a balanced sample. Balance tables for each individual experiment are

[26] In the original question developed by Frederick (2005) the price was asked for a bat and ball instead of a hurley and sliotar. We changed this question to make it more suitable with Irish context as Hurling is the most popular sports in Ireland.

[27] The correct answers are 5 minutes, 5 cents and 47 days.

Table 3: Balance in the Control, Treatment 1 and Treatment 2

	Control Group Versus Treatment 1 (N=2000)				Control Group Versus Treatment 2 (N=2000)			
	Mean (N=1000) (Control)	Mean (N=1000) (T1)	Diff.	P-value	Mean (N=1000) (Control)	Mean (N=1000) (T2)	Diff.	P-value
1=Male, 0=Female	0.48	0.49	-0.01	0.59	0.48	0.51	-0.04	0.11
Exact Age	44.44	44.75	-0.31	0.65	44.44	43.81	0.63	0.34
Occupational Group	5.63	5.61	0.03	0.87	5.63	5.44	0.19	0.21
Social Class: A to F	3.73	3.82	-0.08	0.22	3.73	3.71	0.02	0.74
1=Urban 0=Rural	0.73	0.73	0.00	0.96	0.73	0.71	0.02	0.25
Marital Status	2.25	2.31	-0.06	0.43	2.25	2.31	-0.06	0.41
Number of Children	0.86	0.89	-0.03	0.56	0.86	0.88	-0.02	0.7
Employment Status	3.34	3.23	0.12	0.29	3.34	3.19	0.15	0.18
Purchased House	3.7	3.71	0.00	0.95	3.7	3.67	0.03	0.66
Purchased Mortgage	3.99	4.04	-0.05	0.37	3.99	3.97	0.02	0.72
Plan Mortgage	3.16	3.16	0.00	0.97	3.16	3.13	0.04	0.52
Plan House Purchase	2.96	2.97	-0.01	0.8	2.96	2.92	0.04	0.45
Education	4.43	4.47	-0.03	0.65	4.43	4.46	-0.02	0.77
Household Income	2.69	2.73	-0.03	0.65	2.69	2.64	0.05	0.47
Proportion of Income Saved	2.76	2.72	-0.04	0.59	2.76	2.8	-0.04	0.52
Cash Constrained Intensity	2.87	2.83	-0.04	0.55	2.87	3.03	-0.16**	0
Foresee large expense	0.38	0.39	-0.01	0.85	0.38	0.38	0.00	0.85
Total Number of Loans	0.65	0.65	0.00	0.92	0.65	0.62	0.03	0.39
Has Credit Card?	0.64	0.65	-0.01	0.64	0.64	0.66	-0.02	0.3
Present Bias detected	0.29	0.24	0.05**	0.01	0.29	0.24	0.05**	0.01
Level of Impatience	3.29	3.38	-0.09	0.09	3.29	3.36	-0.07	0.14
Financial Riskiness	2.47	2.49	-0.01	0.78	2.47	2.49	-0.02	0.68
Debt-Use	0.17	0.17	0.00	0.95	0.17	0.17	0.00	0.81
Confidence	1.53	1.53	0.00	0.99	1.53	1.62	-0.08	0.2
Index of Fin. Literacy	0.46	0.43	0.03*	0.08	0.46	0.45	-0.01	0.7
Index on Attentiveness	0.66	0.7	-0.05	0.27	0.66	0.62	0.04	0.38

available in the Appendix B (See Table 13, 14, and 15).

4.3 Methodology

Hypothesis 1 is tested by Equation 4 and from the responses obtained from experiments 1 and 3. The dependent variable '*Mortgage*' takes the value as 1 if the respondent '*i*' choses a high-cost mortgage option A and zero if option B is chosen. The key variables of interest are behavioural variables; *Present Bias*, *Overconfidence*, and *Riskiness*. In addition to these revealed preference measures, we also use the self-perceived responses for these cognitions, captured in the vector *MISC*. Control variables include vectors *DEMO*; capturing the demographic profile of respondents, *FIN*; capturing the financial position, and *LIT*; capturing the financial literacy. Since '*Mortgage*' is binary in nature; therefore, results of Equation 4 are presented as post estimation marginal effects.

$$\begin{aligned} Pr(Mortgage)_i = \alpha_i + \beta(PresentBias)_i + \theta(Overconfidence)_i + \sigma(Riskiness)_i \\ +(\boldsymbol{DEMO})_i\gamma + (\boldsymbol{FIN}_i)\mu + (\boldsymbol{LIT}_i)\pi + (\boldsymbol{MISC}_i)\delta + \epsilon_i \end{aligned} \tag{4}$$

Hypothesis 2 is examined through regression Equation 5 where the dependent variable takes values from the data recorded in the control group of experiment 2 (arm E2.C). The variable of interest is *Attention*. The regression is estimated using probit estimation and results are obtained through marginal effects; with an additional vector of co-variates *BEHAV* controlling for other behavioural biases recorded in the survey.

$$\begin{aligned} Pr(Mortgage)_i = \alpha_i + \beta(Attention)_i + (\boldsymbol{DEMO})_i\gamma + (\boldsymbol{FIN}_i)\mu + (\boldsymbol{LIT}_i)\pi + \\ (\boldsymbol{BEHAV})_i\sigma + \epsilon_i \end{aligned} \tag{5}$$

Hypothesis 3, which compares the 2 versus 1 framing effect of two cash-backs of €3,000 against

single cashback of €6,000 is examined through Equation 6. The choice response data for mortgages A and B in the control groups of experiment one and three are combined (arms E1.C and E3.C). The main variable of interest is '$2v1$' which takes the value as 1 ($x = 1$) if the mortgage response is made from experiment three and zero ($x = 0$) for the response derived from experiment one. Hypothesis 3 is validated if the coefficient β on $2v1$ is positive and statistically significant; implying the significance of the framing effect for the choice of two cashbacks against one.

$$\begin{aligned} Pr(Mortgage)_i = \alpha_i + \beta(2v1)_{i,x=0,1} + \sigma(PresentBias)_i + \theta(Overconfidence)_i + \\ \phi(Riskiness)_i + \psi(Attention)_i + (\boldsymbol{DEMO})_i\gamma + (\boldsymbol{FIN}_i)\mu + (\boldsymbol{LIT}_i)\pi + \epsilon_i \end{aligned} \tag{6}$$

The treatment effect of advanced disclosure on the choice of mortgages, as postulated in hypothesis 4, is obtained from regression Equation 7. For each experiment ($x = 1, 2, 3$) we use the data from respective control (E1.C, E2.C, and E3.C) and treatment 1 groups (E1.1, E2.1, and E3.1). The regression is estimated using probit regression and the main variable of interest is *Treatment*, which takes the value 1 if the respondent is in the treatment group and zero for the control group in respective experiments. In addition to the analysis conducted separately for each experiment, we also obtain results by pooling responses from all experiments respectively.

$$\begin{aligned} Pr(Mortgage)_i = \alpha_i + \beta(Treatment)_{i,x} + (\boldsymbol{BEHAV})_i\sigma + (\boldsymbol{DEMO})_i\gamma + (\boldsymbol{FIN}_i)\mu \\ +(\boldsymbol{LIT}_i)\pi + \epsilon_i \end{aligned} \tag{7}$$

The treatment effect of promotional marketing on the choice of cash-back mortgage A (hypothesis 5) is estimated using the same regression framework, as shown in Equation 7. We use data from the control (E1.C, E2.C, and E3.C) and treatment 2 groups (E1.2, E2.2, and E3.2) of the three experiments ($x = 1, 2, 3$).

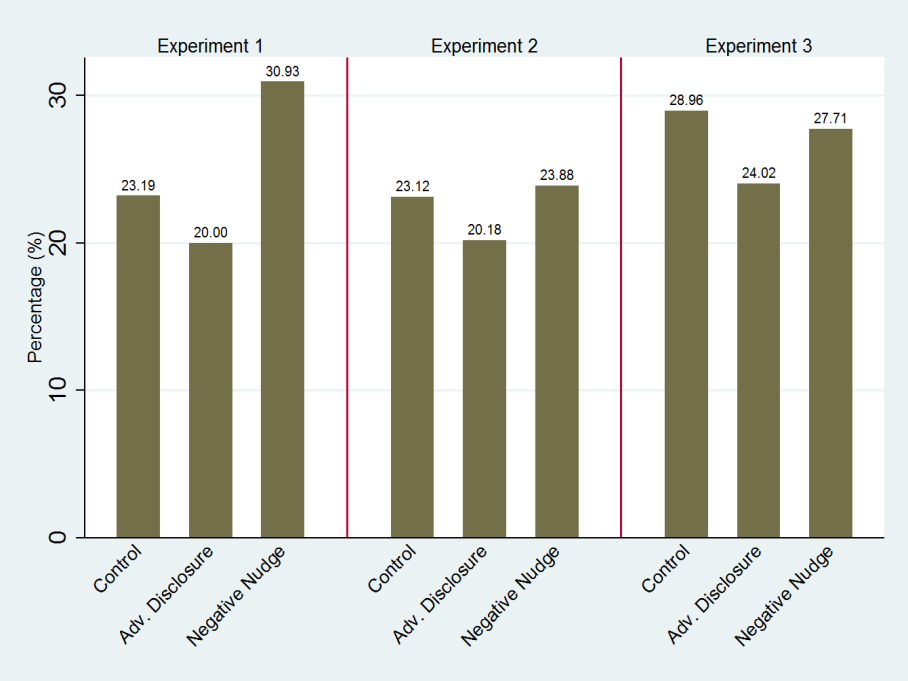
5 Data Description

The first finding that emerges from the data is how consistent preferences for expensive cashback mortgages are. Across the three experiments, when respondents don't receive a treatment, preferences for the expensive cashback mortgage ranged between 23 percent and 29 percent (see Figure 13). The second finding that emerges, relates to the effectiveness of the advanced disclosure, and while we depend on the multivariate analysis to decipher the true impact of the treatment, it is noticeable from a comparison of means that the disclosure reduced preferences for the expensive cashback by on average of 4 percentage points. This was a little surprising to us as we felt the advanced disclosure made it clear, in no uncertain terms, how much more expensive the cashback mortgage was. Even though we find a meaningful treatment effect from our advanced disclosure (see later discussion in Section 6.4), we interpret this as evidence of how challenging it might be for a disclosure agenda to

dramatically reduce demand for expensive cashback products.[28]

The third finding that emerges from the data is the effectiveness of our unsophisticated marketing message. Respondents who were subjected to our negative nudge were on average 3 percentage points more likely to choose the expensive cashback mortgage, although this average hides some heterogeneity in the results.

Figure 13: Cashback choice in each Experiment across respective Arms



Crucially, we find that respondents who choose expensive cashback mortgages have a distinct profile. The results from Table 4, which presents the difference of means t-test for all arms of the experiments pooled together, illustrate that respondents with a preference for the expensive cashback mortgage, belong to urban areas, have more children below 18 years of age, save higher proportion of income, and are more cash-constrained. Saving higher proportion of income and being cash-constrained are counter-intuitive; therefore, we explore this further by obtaining difference of means t-test across subsamples of *mortgage market* and *prospective buyers* (See Table 20 and 21 in Appendix B). The results suggest that savings status does not hold any significance for the sub-groups and it is only the degree of cash-constrain which differs between cashback and non-cashback group. This implies that the proportion of respondents choosing cashback is significantly more cash constrained as compared to respondents who do not choose cashback mortgage.[29]

[28]The difference of means t-test for advanced disclosure across the choice of cashback and non-cashback mortgage shows that respondents who choose cashback mortgages are more urban, have more loans, are more risk-taking, possess credit-card, are more likely to use loans, tend to live for today, are more affected by advertising and opinion of others, and find more satisfying to spend money. There were no statistical

Table 4: Difference of Means t-test between cashback and no-cashback mortgage choice

Variables	Mean (No-cashback) (N=2,260)	Mean (Cashback) (N=740)	Difference Diff.	(P-value)
1=Male, 0=Female	0.49	0.5	-0.01	0.79
Exact Age	45.22	41.62	3.60***	0.00
Social Class: A to F	3.73	3.82	-0.09	0.14
1=Urban 0=Rural	0.71	0.77	-0.06***	0.00
Marital Status	2.27	2.33	-0.05	0.42
Number of Children below 18 Years	0.81	1.08	-0.27***	0.00
Employment Status	3.35	2.97	0.38***	0.00
Highest level of Education	4.48	4.38	0.1	0.13
Household Income (Increasing)	2.7	2.64	0.06	0.38
Proportion of Income Saved (Increasing)	2.73	2.86	-0.13*	0.04
Cash Constrained Intensity (1: Great Deal, 5: None)	2.96	2.74	0.22***	0.00
Foresee large expense in coming Years	0.38	0.4	-0.02	0.32
Total Number of Loans	0.6	0.74	-0.13***	0.00
Has Credit Card?	0.63	0.71	-0.08***	0.00
If Present Bias detected from Choice Questions	0.24	0.31	-0.07***	0.00
Level of Impatience (Decreasing, Increasing for Patience)	3.35	3.33	0.02	0.72
Financial Riskiness (Increasing)	2.39	2.78	-0.40***	0.00
Accumulate Savings to Buy, 1: Use loan option (Debt-Use)	0.13	0.31	-0.19***	0.00
Confidence Based on Total Correct Answers (Increasing)	1.57	1.53	0.04	0.52
Index of Fin. Literacy based on weights (Increasing)	0.48	0.32	0.16***	0.00
Index on attentiveness using (Increasing)	0.75	0.39	0.36***	0.00
Expect Inheritance, 0:No, 1:Yes	0.27	0.33	-0.06***	0.00
How much does Advertising affect your purchase? (Increasing)	3.1	3.68	-0.58***	0.00
Tend to Live for today without thinking of tomorrow (Increasing)	3.35	3.89	-0.54***	0.00
Carefully consider purchases (Increasing)	5.15	4.84	0.32***	0.00
Keep close watch on Spending (Increasing)	5.63	5.24	0.39***	0.00
Set Long Term Financial Goals (Increasing)	4.7	4.66	0.04	0.54
Have Household Budget (Increasing)	4.79	4.82	-0.03	0.63
How much does opinion of others affect your behaviour? (Increasing)	3.05	3.56	-0.51***	0.00
More satisfying to spend money then save (Increasing)	3.46	3.93	-0.47***	0.00

Further, the tests shows that the proportion of respondents choosing cashback are present biased, have a credit card, perceive taking more financial risk, are debt-users, expect inheritance, are affected by advertising, tend to live for today, are affected by opinion of others, and who find it more satisfying to spend money rather than save. In contrast, preferences for non-cashback mortgages are significantly lower for respondents that are employed in stable jobs, have higher financially literacy score, are more attentive, carefully consider purchasing decisions, and keep close watch on personal spending (see 4).

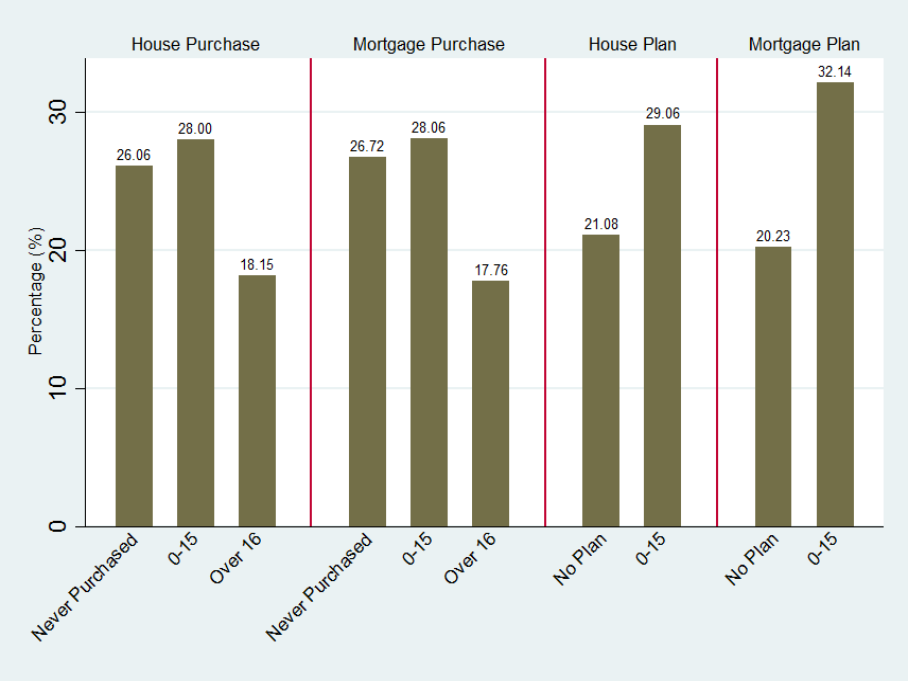
The significance of these factors remains unchanged when the difference of means t-test is obtained across control and treatment groups of the three experiments separately, as shown in Appendix B (see Table 16, 17, 18, and 19). Moreover, we find same results when the sample is restricted to *mortgage market* and *prospective buyers* for three experiments combined across control and treatment arms (see Table 20 and 21 in Appendix B).

The cashback choice for different categories of housing and mortgage choice is shown in Figure 14. It can be seen from the graph that the proportion of cashback choice is highest for respondents who purchased mortgage or house in last 15 years or have any prospective plans in the next 15 years, ranging between 28-32 percent. Further, the choice of cashback is least attractive for respondents who purchased a house or mortgage over 16 years ago, average around 18 percent.

differences in terms of present-bias, cash-constrain, and income (see Table 16 in Appendix B).

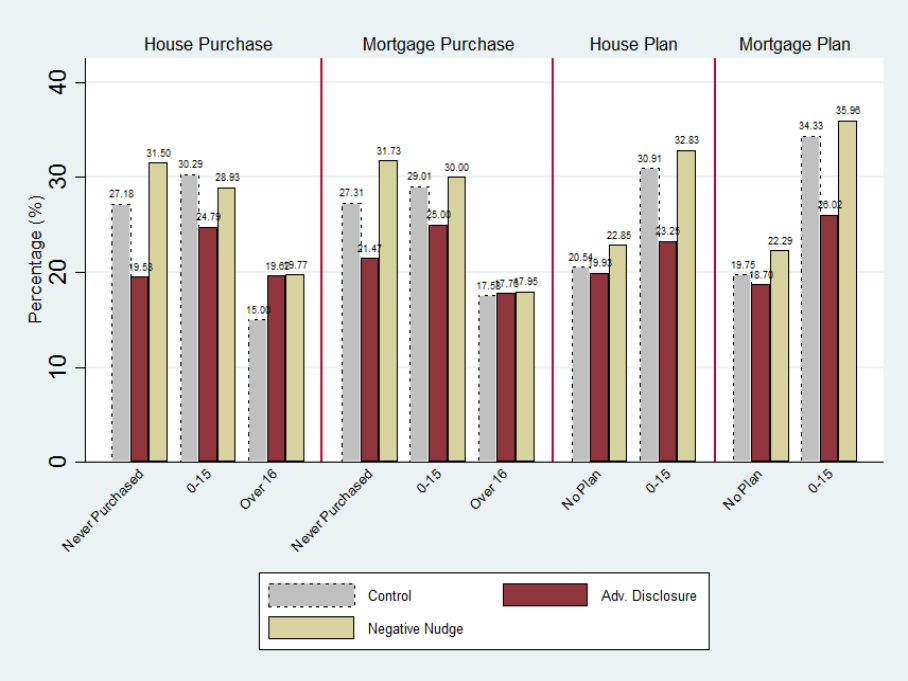
[29]The difference of means for advanced disclosure in subsamples of mortgage market and prospective buyers show that there were no statistical difference for degree of cash constrain across cashback and no-cashback group (See Table 20 and 21 in Appendix B)

Figure 14: Choice of cashback in Housing and Mortgage Decision



The results from Figure 14 are further disaggregated for the three arms across all experiment, as shown in Figure 15. It can be inferred that cashback choice is most attractive for respondents in treatment 2; the marketing nudge, ranging between 28-36 percent for all categories of house (mortgage) purchase or plan. Moreover, in relation to the effectiveness of advanced disclosure, the results reflect the findings from Figure 13 with choice of cashback being least attractive for respondents across different categories of house (mortgage) purchase or plan.

Figure 15: Choice of cashback in Housing and Mortgage Decision



6 Results

6.1 Hypothesis 1: Present Bias, Riskiness, Overconfidence

Systematic evidence is found that adults and prospective house/mortgage purchasers are more likely to choose expensive cashback mortgages if they are characterised by present bias. The univariate analysis suggests that the revealed preference measure of present bias (using the methodology of Meier and Sprenger (2010)) is related to the choice of expensive cashback mortgages for both experiment one and three.[30,31] The multivariate analysis (see Table 5) finds that present bias, is statistically significant at the 1 percent level across all specifications for all adults (see Appendix C for all specifications),[32] with the effect size ranging around 8 percent.[33] Intuitively, this means that tendency to be present-bias increases the likelihood of choosing more expensive cashback mortgage by 8 percent. Present bias is also a predictor of choice of cashback mortgage for our subsamples of mortgage

[30] Refer to Table 4 and difference of means t-test results in Table 17 and 19 in Appendix B.

[31] For the self-reported measure of present-bias, captured by the variable impatience, we do not find any significant difference between the mortgage choice for either of the experiments or the pooled sample (see Table 5 and Table 6).

[32] We check if the main results are sensitive to multicollinearity by using revealed and stated preference measures separately for the specification shown in Appendices, however we do not find any evidence for multicollinearity to affect the main results

[33] The multivariate probit regressions control for location fixed effects and demographic controls with standard errors clustered for regions. The regression is controlled for income, cash-constrained, and savings proportion in only one specification because inclusion of these controls lead to significant loss of observations due to many respondents choosing 'Not Willing to Respond' for these variables.

market and prospective buyers. We also find statistically significant results for both experiments one and three separately (see Table 6).[34,35]

Confidence, as mentioned earlier, is captured as personal belief on how many challenging confidence interval questions a respondent answered correctly. In univariate analysis, we do not find evidence that confidence influences the choice of mortgage. A higher appetite for financial risk, whether measured through revealed preferences in lottery or a self-reported measure, is statistically related in univariate tests to the choice of mortgage.[36] However, in our multivariate analysis, irrespective of the specification, we do not find significant evidence that either confidence or financial risk preferences affect mortgage choice. In addition, the coefficients for confidence and financial risk preferences are insignificant for different subsamples and across different specifications, as shown in Appendix C, D, and E.

In terms of other behavioural biases, we find that the choice of expensive cashback option A is positively and significantly affected by tendency towards debt-use. In contrast, the choice of cashback is reduced with increasing levels of attentiveness, as captured by the number of correct responses from CRT.

For demographic factors, the choice of cashback is reduced with increasing levels of education, and age of the respondent. These results indicate how being older, and more educated reduces the likelihood a respondent to prefer the expensive cashback mortgage. Interestingly, we also find that the choice of a larger single cashback mortgage is positively related with the respondent being male (experiment one result in Table 6); however, the result is opposite when the cashback is split into two, with half delayed for one year (experiment three results in Table 6). This implies the efficacy of delayed cashback being more appealing to women, given that female respondents in our experiment report significantly more careful nature for long-term outcomes as compared to males.[37]

[34]The results from different specifications, shown in Appendix C, D, and E are consistent with the full regression models from main analysis, and each subsamples respectively.

[35]The univariate analysis of present bias (see Table 22 in Appendix B) reveals that respondents detected for present bias are less educated, have less income, are more cash-constrained, foresee a large expense in the future, value cash-back mortgages, and tend to live for today without much attention for future.

[36]For univariate analysis on confidence and appetite for risk (self-perceived or lottery), see results in Table 4 and difference of means t-test results in Table 17 and 19 in Appendix B.

[37]The mean for the variable 'careless for long run' (increasing scale from 1 to 7) is 3.02 for Females and 3.20 for males (Men:1 and Women:0), significant at 5 percent level.

Table 5: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C)

	Main Analysis		Mortgage Market		Prospective Buyers	
Variables	**(1) Cash Back E1.C&E3.C**	**(2) Cash Back E1.C&E3.C**	**(3) Cash Back E1.C&E3.C**	**(4) Cash Back E1.C&E3.C**	**(5) Cash Back E1.C&E3.C**	**(6) Cash Back E1.C&E3.C**
Present Bias	0.083***	0.082***	0.054**	0.083*	0.125***	0.188***
	(0.015)	(0.029)	(0.026)	(0.046)	(0.036)	(0.050)
Confidence	0.001	0.003	0.003	0.003	0.013	0.013
	(0.009)	(0.010)	(0.019)	(0.012)	(0.028)	(0.030)
Lottery	-0.020	-0.025*	-0.031	-0.031	-0.043	-0.043
	(0.018)	(0.014)	(0.042)	(0.035)	(0.083)	(0.076)
Impatience	0.007	0.013	0.019	0.033**	0.023	0.019**
	(0.012)	(0.016)	(0.018)	(0.014)	(0.022)	(0.010)
Financial Risk (Self-perceived)	0.028	0.001	0.020	-0.015	0.011	-0.016
	(0.022)	(0.021)	(0.017)	(0.028)	(0.020)	(0.028)
Debt Use	0.175***	0.213***	0.211**	0.268**	0.283***	0.355***
	(0.055)	(0.065)	(0.085)	(0.107)	(0.064)	(0.120)
Fin. Lit. Index	-0.054	-0.004	-0.042	0.012	0.071	0.082
	(0.048)	(0.050)	(0.051)	(0.071)	(0.079)	(0.063)
Attentive	-0.087***	-0.076***	-0.088***	-0.075	-0.075***	-0.094**
	(0.022)	(0.026)	(0.033)	(0.046)	(0.026)	(0.044)
Gender	0.046**	0.039**	0.091***	0.084***	-0.008	-0.022
	(0.022)	(0.016)	(0.009)	(0.030)	(0.050)	(0.083)
Age	-0.006***	-0.008***	-0.007***	-0.010***	-0.011***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Urban	0.010	0.036	0.040	0.097	-0.018	0.146
	(0.021)	(0.034)	(0.060)	(0.091)	(0.127)	(0.175)
Education	-0.018***	-0.019**	-0.031**	-0.026*	-0.037***	-0.007
	(0.007)	(0.009)	(0.013)	(0.015)	(0.013)	(0.014)
Credit Card (1=Yes)	0.089***	0.083***	0.045	0.017	0.131***	0.127**
	(0.023)	(0.023)	(0.034)	(0.036)	(0.030)	(0.063)
Saving Proportion		0.010		0.004		-0.026**
		(0.015)		(0.027)		(0.011)
Cash Constrained		-0.000		0.009		0.029
		(0.032)		(0.026)		(0.057)
Income		-0.013*		-0.009		-0.014
		(0.008)		(0.009)		(0.012)
Observations	653	508	410	320	236	183
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

Table 6: Hypothesis 1 for Control groups in Experiment 1 and 3 (E1.C and E3.C separately)

	Experiment 1						Experiment 3					
	Main Analysis		Mortgage Market		Prospective Buyers		Main Analysis		Subsample 1		Subsample 2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**
Present Bias	0.096***	0.138***	0.178***	0.165**	0.224***	0.270***	0.113**	0.173***	0.002	0.267***	0.042	-0.042
	(0.031)	(0.038)	(0.056)	(0.070)	(0.062)	(0.039)	(0.045)	(0.038)	(0.085)	(0.078)	(0.060)	(0.061)
Confidence	-0.024	-0.027**	0.006	0.011	-0.006	-0.050	0.026*	0.026	0.060***	0.045***	0.087***	0.140***
	(0.017)	(0.013)	(0.013)	(0.013)	(0.030)	(0.030)	(0.015)	(0.028)	(0.019)	(0.014)	(0.023)	(0.051)
Lottery	0.018	-0.122***	-0.039	-0.085	0.084	0.108	-0.037	-0.035	-0.149	-0.180***	-0.109	-0.204**
	(0.033)	(0.028)	(0.052)	(0.078)	(0.089)	(0.110)	(0.069)	(0.076)	(0.097)	(0.054)	(0.168)	(0.101)
Impatience	0.008	0.012	-0.004	-0.015	-0.002	-0.003	0.006	0.023	0.053**	0.095***	0.034	0.114***
	(0.008)	(0.017)	(0.033)	(0.046)	(0.032)	(0.024)	(0.017)	(0.024)	(0.022)	(0.030)	(0.052)	(0.029)
Financial Risk (Self-perceived)	0.046**	0.053**	0.029	0.046***	0.070	0.023	0.016	-0.044***	0.014	-0.002	0.075*	0.086**
	(0.018)	(0.027)	(0.031)	(0.016)	(0.046)	(0.017)	(0.033)	(0.015)	(0.041)	(0.055)	(0.043)	(0.040)
Debt Use	0.184***	0.230**	0.333***	0.380***	0.469***	0.511***	0.202***	0.242***	0.270**	0.360**	0.155***	0.256***
	(0.066)	(0.098)	(0.088)	(0.069)	(0.070)	(0.126)	(0.067)	(0.088)	(0.117)	(0.141)	(0.060)	(0.098)
Fin. Lit. Index	-0.034	0.001	0.077	0.115	0.275***	0.248***	-0.066**	-0.059	-0.119	-0.053	0.003	-0.078
	(0.085)	(0.093)	(0.122)	(0.119)	(0.098)	(0.065)	(0.029)	(0.060)	(0.108)	(0.048)	(0.087)	(0.087)
Attentive	-0.050	-0.022	-0.088***	-0.063***	-0.108***	-0.099**	-0.130***	-0.124***	-0.199***	-0.133**	-0.144***	-0.126***
	(0.041)	(0.036)	(0.020)	(0.019)	(0.034)	(0.039)	(0.012)	(0.025)	(0.049)	(0.066)	(0.055)	(0.030)
Gender	0.108**	0.132***	0.292***	0.274***	0.178*	0.277***	-0.021	-0.076***	-0.130***	-0.183***	-0.171***	-0.361***
	(0.047)	(0.050)	(0.085)	(0.043)	(0.102)	(0.066)	(0.022)	(0.029)	(0.040)	(0.070)	(0.040)	(0.077)
Age	-0.009***	-0.011***	-0.014**	-0.015***	-0.006**	-0.015***	-0.004	-0.006	-0.002	-0.005	-0.001	0.001
	(0.002)	(0.003)	(0.006)	(0.006)	(0.003)	(0.001)	(0.005)	(0.005)	(0.005)	(0.009)	(0.008)	(0.011)
Urban	0.059**	0.111***	0.057	0.053	0.080	0.167	-0.043*	-0.029	-0.038	0.091	-0.015	0.201
	(0.024)	(0.028)	(0.152)	(0.112)	(0.134)	(0.147)	(0.025)	(0.044)	(0.089)	(0.081)	(0.101)	(0.235)
Education	-0.031***	-0.049**	-0.049*	-0.056	-0.064**	-0.077***	-0.011**	-0.009	-0.025***	0.001	-0.011	-0.038
	(0.009)	(0.020)	(0.029)	(0.038)	(0.031)	(0.021)	(0.005)	(0.013)	(0.009)	(0.024)	(0.018)	(0.030)
Credit Card (1=Yes)	0.091**	0.108**	0.061	0.100	0.154	0.181***	0.054**	0.027	-0.137*	-0.076	0.020	0.020
	(0.035)	(0.044)	(0.064)	(0.064)	(0.129)	(0.057)	(0.026)	(0.075)	(0.071)	(0.076)	(0.095)	(0.146)
Saving Proportion		-0.001		0.033		-0.056		0.033		0.033		-0.083***
		(0.017)		(0.042)		(0.037)		(0.030)		(0.030)		(0.017)
Cash Constrained		-0.040***		-0.013		0.018		-0.017		0.035		0.118
		(0.008)		(0.022)		(0.025)		(0.048)		(0.052)		(0.078)
Income		0.022**		0.019		-0.038		-0.040***		0.011		0.034
		(0.010)		(0.032)		(0.025)		(0.012)		(0.016)		(0.023)
		-0.01		-0.032		-0.025		-0.012		-0.016		-0.023
Observations	325	257	173	127	95	79	297	206	177	129	118	89
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

6.2 Hypothesis 2: Limited Attention Bias

To isolate the impact of limited attention bias, and eliminate the role of present bias, over confidence and short-term liquidity constraints, experiment two presents mortgage options that are financially equivalent at the point of drawdown. Both mortgages in experiment two have upfront costs of €44,000, while the cashback mortgage is more expensive over the term of the loan (total cost and monthly cost) due to higher interest rates. The univariate analysis shows that respondents that choose expensive cashback mortgage option A score significantly low on the Cognitive Reflection Tests (CRT) and financial literacy questions, with the differential being significant at 1 percent level.[38]

Table 7: Hypothesis 2, Limited Attention Bias for Control Group in Experiment 2 (E2.C)

	Main Analysis		Mortgage Market		Prospective Buyers	
Variables	**(1) Cashback E2.C**	**(2) Cashback E2.C**	**(3) Cashback E2.C**	**(4) Cashback E2.C**	**(5) Cashback E2.C**	**(6) Cashback E2.C**
Attentive	-0.078***	-0.069**	-0.058***	-0.194***	-0.034	-0.071***
	(0.026)	(0.034)	(0.019)	(0.067)	(0.045)	(0.023)
Fin. Lit. Index	-0.224***	-0.178**	-0.297***	-0.307**	-0.309**	-0.243*
	(0.069)	(0.073)	(0.085)	(0.127)	(0.123)	(0.126)
Present Bias	0.008	0.097*	-0.037	0.147	-0.138*	0.102
	(0.048)	(0.058)	(0.079)	(0.129)	(0.072)	(0.084)
Confidence	0.024***	0.039***	0.013	0.063***	0.037***	0.051***
	(0.007)	(0.010)	(0.022)	(0.012)	(0.007)	(0.015)
Lottery	0.045	0.109	0.024	0.283***	0.234***	0.279**
	(0.070)	(0.082)	(0.061)	(0.059)	(0.064)	(0.117)
Careful In Purchase	-0.015***	-0.019	-0.010	-0.058***	0.065***	0.019
	(0.006)	(0.019)	(0.016)	(0.017)	(0.019)	(0.043)
Impatience	0.016	0.056	0.033	0.176**	-0.067**	-0.041
	(0.014)	(0.040)	(0.024)	(0.081)	(0.031)	(0.045)
Financial Risk (Self-perceived)	0.062***	0.053***	0.103***	0.171***	0.034	0.017
	(0.016)	(0.018)	(0.038)	(0.050)	(0.022)	(0.047)
Debt Use	0.183***	0.229***	0.211***	0.064	0.425***	0.306**
	(0.043)	(0.010)	(0.045)	(0.116)	(0.091)	(0.124)
Gender	0.024	-0.003	-0.108***	-0.132**	-0.209**	-0.109
	(0.031)	(0.054)	(0.032)	(0.063)	(0.103)	(0.166)
Age	-0.002***	-0.002	-0.001	-0.000	0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)	(0.006)
Urban	0.040	0.022	0.046**	0.176**	-0.011	-0.063
	(0.030)	(0.059)	(0.023)	(0.075)	(0.154)	(0.176)
Education	-0.021*	-0.057***	-0.033***	-0.077***	-0.050**	-0.038
	(0.013)	(0.009)	(0.007)	(0.012)	(0.020)	(0.028)
Credit Card (1=Yes)	0.110*	0.102	0.128**	0.081	0.139**	0.245***
	(0.059)	(0.079)	(0.063)	(0.089)	(0.055)	(0.091)
Saving Proportion		0.045**		0.073***		-0.003
		(0.019)		(0.025)		(0.014)
Cash Constrained		-0.057***		-0.074**		0.006
		(0.018)		(0.034)		(0.029)
Income		-0.021		0.005		0.001
		(0.034)		(0.053)		(0.035)
Observations	293	200	169	120	131	96
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Buyers: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

In the multivariate analysis (see Table 7), attentiveness and financial literacy are negatively related with the choice of expensive cashback mortgage for our sample of 3,000 adults (significant at 1% and 5% level). The results hold for both subsamples of mortgage market and prospective buyers; however, the result for financial literacy is slightly more robust as compared to attentiveness for the subsample of prospective buyers. It is reasonable to suspect that loss in the significance of attentiveness for prospective buyers is due to small sample size.

[38] Refer Table 4 and Table 18 in Appendix B.

In the main analysis, the effect size of attentiveness ranges from 6 percent to 8 percent, while financial literacy is around 22 percent. Intuitively, this means that a unit increase in attentiveness, as recorded in the CRT questions, reduces the likelihood of choosing an expensive cashback mortgage by 6 to 8 percent. In terms of financial literacy, the marginal effects suggests that with unit increase in the number of literacy questions answered correctly, there is an associated decline for the choice of cashback mortgage A by 22 percent.

6.3 Hypothesis 3: 2 versus 1 Framing Effect

Some mortgage products in Ireland offer staggered cashback payments into the future. We assess the relative preferences for a split cashback (1 percent immediately and 1 percent after 1 year). To achieve this, we use pooled data from the control groups of experiment one and three (E1.C and E3.C) to compare if two cashbacks of €3,000 each, offered in experiment three, significantly affect the cashback choice against a single cashback of €6,000, offered in experiment one. The results for the framing effect of two cashbacks against one shall provide evidence if respondent preference for cashbacks is positively affected by the marketing strategy of some banks that provide combination of immediate and delayed cashbacks to lure consumers in opting cashback mortgages.

Table 8: Hypothesis 3, 2 versus 1 Framing Effect for Control Group in Experiment 1 and 3 (E1.C and E3.C)

	Main Analysis		**Mortgage Buyers**		**Prospective Buyers**	
Variables	**(1) Cashback E2.C**	**(2) Cashback E2.C**	**(3) Cashback E2.C**	**(4) Cashback E2.C**	**(5) Cashback E2.C**	**(6) Cashback E2.C**
2v1	0.049*	0.047*	0.051*	0.048*	0.009	-0.020
	(0.025)	(0.027)	(0.026)	(0.029)	(0.038)	(0.035)
Present Bias	0.081***	0.079***	0.053**	0.088*	0.124***	0.191***
	(0.014)	(0.028)	(0.024)	(0.046)	(0.037)	(0.053)
Confidence	0.002	0.005	0.005	0.006	0.013	0.012
	(0.010)	(0.011)	(0.019)	(0.015)	(0.028)	(0.030)
Lottery1	-0.015	-0.022	-0.024	-0.025	-0.042	-0.045
	(0.019)	(0.015)	(0.044)	(0.043)	(0.087)	(0.074)
Impatience	0.007	0.012	0.017	0.029*	0.023	0.020*
	(0.012)	(0.016)	(0.018)	(0.016)	(0.023)	(0.011)
Financial Risk (Self Perceived)	0.028	0.001	0.018	-0.013	0.011	-0.016
	(0.023)	(0.022)	(0.018)	(0.032)	(0.020)	(0.027)
Debt Use	0.174***	0.210***	0.209**	0.263**	0.283***	0.357***
	(0.053)	(0.065)	(0.083)	(0.114)	(0.067)	(0.121)
Fin Lit Index	-0.051	-0.004	-0.044	0.001	0.071	0.082
	(0.050)	(0.050)	(0.052)	(0.064)	(0.079)	(0.062)
Attentive	-0.086***	-0.076***	-0.086***	-0.070	-0.075***	-0.095**
	(0.022)	(0.026)	(0.033)	(0.046)	(0.024)	(0.045)
Gender	0.044**	0.039**	0.087***	0.081**	-0.008	-0.022
	(0.020)	(0.018)	(0.011)	(0.034)	(0.049)	(0.083)
Age	-0.006***	-0.007***	-0.007***	-0.008	-0.011***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.014)	(0.004)	(0.003)
Urban	0.008	0.034	0.043	0.090	-0.016	0.144
	(0.022)	(0.037)	(0.059)	(0.089)	(0.119)	(0.173)
Education	-0.019***	-0.018*	-0.032**	-0.024	-0.037***	-0.006
	(0.007)	(0.010)	(0.013)	(0.017)	(0.013)	(0.013)
Credit Card (1=Yes)	0.089***	0.083***	0.043	0.027	0.130***	0.130**
	(0.021)	(0.022)	(0.033)	(0.026)	(0.031)	(0.060)
Saving Proportion		0.009		0.008		-0.027***
		(0.015)		(0.026)		(0.010)
Cash Constrained		-0.001		0.012		0.029
		(0.031)		(0.027)		(0.057)
Income		-0.014*		-0.016		-0.015
		(0.008)		(0.011)		(0.011)
Observations	653	508	410	320	236	183
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

We find that splitting one cashback into two, with half delayed for one year, increases the likelihood of adoption of expensive cashback mortgage with an effect size of almost 5 percent (see Table 8). This result holds for the main analysis and sample of mortgage market at the 10 percent level of significance. However, the result loses significance when prospective buyers are considered and this may have occurred due to small sample size; reducing by almost half.[39]

Lastly, these results re-confirm the positive role of present-bias and negative role of attentiveness for the choice of cashback mortgage (as discussed earlier in sub-section 6.1 and 6.2).

6.4 Hypothesis 4: Advanced Consumer Disclosure

Advanced disclosure reduces consumer's tendency to choose higher cost cashback mortgages.[40] The coefficient from the pooled regressions suggests that for prospective buyers, advanced disclosure reduces the likelihood of choosing a high cost cashback mortgage by between 6.4 percent and 10 percent (significant at 1 percent level). Table 9 provides results when three experiments are pooled together for the main analysis, and subsamples of mortgage market and prospective buyers.[41]

Intuitively, the marginal effect of 6.4 percent associated with the advanced disclosure for subsample of prospective buyers implies an overall reduction of 1.77 percent in the choice of cashback mortgages.[42] Mirroring this result with the current status of mortgage market in Ireland leads us to conclude that with almost 14,939 mortgages drawn in 2017,[43] the advanced disclosure had ability to reduce drawdown of 254 expensive cashback mortgages. Although, not huge in terms of the total volume, the result confirms how an informed policy action towards transparency in mortgage market has potential to increase rational consumer decision making.

The conclusion that advanced disclosures are effective is backed up by independent results from each of the three experiments, with one caveat (see Table 10). Advanced disclosure is not effective for experiment two when we restrict the main sample to respective subsamples. It is possible that this is due to statistical power, although we are able to find results for these subsamples for experiment one and three, each with similar sample sizes. It is conceivable that the group of people who would be affected by the advanced disclosure were sufficiently attentive to notice the financial equivalence of the two products in experiment two.

[39] It is interesting to consider if the choice of delayed cashback is affected by the degree of liquidity issues or income; however controlling for these factors does not explain any significant relationship with choice of cashback. Also, the results remain unaffected by the inclusion of the controls for income, savings and degree of cash-constrained.

[40] Refer Figure 13 and 15.

[41] The effect size of advanced disclosure ranges between 4 percent and 10 percent for the main analysis and subsample of *mortgage market* and *prospective buyers*.

[42] 27.70 percent respondents for subsample of prospective buyers choose cashback mortgage option A in the control group and treatment 1. Therefore, effect-size of 6.4 percent out of a total of 27.70 percent approximates to 1.77 percent $(0.064 * 0.2770 = 0.0177)$

[43] Banking and Payments Federation Ireland (BPFI) Mortgage Drawdowns Report Q2 (2017).

Table 9: Hypothesis 4, Treatment effect of Advanced Prototype disclosure (Treatment 1) pooled three experiments

	Main Analysis		Mortgage Market		Prospective Buyers	
Variables	**(1) Cashback E2.C**	**(2) Cashback E2.C**	**(3) Cashback E2.C**	**(4) Cashback E2.C**	**(5) Cashback E2.C**	**(6) Cashback E2.C**
Treatment 1	-0.040***	-0.060***	-0.070***	-0.083***	-0.064***	-0.101***
	(0.007)	(0.005)	(0.017)	(0.016)	(0.013)	(0.029)
Present Bias	0.030*	0.017	0.008	0.014	0.016	0.016
	(0.017)	(0.031)	(0.034)	(0.042)	(0.046)	(0.055)
Confidence	0.009**	0.010***	0.007	0.006	0.021	0.018
	(0.004)	(0.002)	(0.009)	(0.005)	(0.013)	(0.011)
Lottery1	0.003	0.000	0.003	-0.004	-0.015	-0.018
	(0.025)	(0.021)	(0.019)	(0.009)	(0.031)	(0.023)
Impatience	0.003*	0.007	0.008	0.017	0.010	0.010
	(0.001)	(0.008)	(0.007)	(0.013)	(0.011)	(0.013)
Financial Risk	0.023***	0.011	0.020*	0.004	0.014	-0.002
	(0.008)	(0.009)	(0.010)	(0.013)	(0.010)	(0.011)
Debt Use	0.136***	0.159***	0.155***	0.180***	0.187***	0.216***
	(0.031)	(0.031)	(0.035)	(0.042)	(0.033)	(0.040)
Fin Lit Index	-0.122***	-0.102***	-0.086***	-0.057***	-0.060**	-0.038
	(0.023)	(0.016)	(0.016)	(0.017)	(0.030)	(0.039)
Attentive	-0.068***	-0.055***	-0.080***	-0.070***	-0.076***	-0.065***
	(0.015)	(0.016)	(0.014)	(0.015)	(0.017)	(0.020)
Gender	0.018	0.019	0.008	0.008	-0.033	-0.032
	(0.027)	(0.018)	(0.025)	(0.018)	(0.024)	(0.024)
Age	-0.001	-0.001*	-0.002	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Urban	0.030*	0.043**	0.004	0.033	0.002	0.011
	(0.018)	(0.019)	(0.021)	(0.037)	(0.023)	(0.022)
Education	-0.015**	-0.020***	-0.020**	-0.024***	-0.027***	-0.036***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.004)	(0.008)
Large Expense	0.012	0.008	0.031	0.018	0.029	0.018
	(0.031)	(0.032)	(0.031)	(0.030)	(0.019)	(0.028)
Credit Card (1=Yes)	0.068**	0.066**	0.064*	0.041	0.092**	0.078
	(0.031)	(0.033)	(0.038)	(0.037)	(0.046)	(0.051)
Saving Proportion		0.019**		0.010		-0.005
		(0.008)		(0.013)		(0.013)
Cash Constrained		-0.010		-0.005		-0.002
		(0.008)		(0.004)		(0.009)
Income		-0.012		-0.008		0.002
		(0.010)		(0.009)		(0.012)
Observations	1,991	1,570	1,292	1,024	892	701
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

Table 10: Hypothesis 4, Treatment effect of Advanced Prototype disclosure (Treatment 1) across 3 experiments

	Main Analysis						Mortgage Market						Prospective Buyers					
Variables	**Experiment 1** (1)	(2)	**Experiment 2** (3)	(4)	**Experiment 3** (5)	(6)	**Experiment 1** (7)	(8)	**Experiment 2** (9)	(10)	**Experiment 3** (11)	(12)	**Experiment 1** (13)	(14)	**Experiment 2** (15)	(16)	**Experiment 3** (17)	(18)
Treatment 1 Exp. 1	-0.052**	-0.072***					-0.122***	-0.137***					-0.126***	-0.165***				
	(0.023)	(0.027)					(0.041)	(0.035)					(0.019)	(0.052)				
Treatment 1 Exp. 2			-0.053**	-0.080***					-0.074	-0.099					-0.053	-0.092		
			(0.023)	(0.026)					(0.050)	(0.086)					(0.049)	(0.104)	-0.066***	-0.151***
Treatment 1 Exp. 3					-0.042***	-0.070***					-0.056***	-0.063***					(0.020)	(0.032)
					(0.008)	(0.023)					(0.017)	(0.015)					0.061	0.115**
Present Bias	0.052**	0.033	-0.018	0.007	0.043	0.033	0.065	0.053	-0.039	0.018	0.043	0.069	0.058	0.055	-0.046	0.067	(0.046)	(0.052)
	(0.022)	(0.025)	(0.034)	(0.021)	(0.030)	(0.061)	(0.055)	(0.068)	(0.051)	(0.044)	(0.037)	(0.046)	(0.058)	(0.083)	(0.062)	(0.059)	0.043**	0.034**
Confidence	-0.012	-0.014**	0.021***	0.028**	0.017***	0.007	0.001	-0.002	0.012	0.016	0.018***	0.001	-0.003	-0.016	0.035**	0.045**	(0.019)	(0.015)
	(0.010)	(0.006)	(0.008)	(0.011)	(0.006)	(0.013)	(0.012)	(0.007)	(0.012)	(0.015)	(0.007)	(0.012)	(0.017)	(0.022)	(0.015)	(0.022)	-0.134*	-0.174**
Lottery1	0.017	-0.017	-0.002	0.012	0.008	-0.002	0.039	0.039	-0.052	-0.078	-0.028	-0.066*	0.045	0.055	-0.025	-0.110**	(0.075)	(0.081)
	(0.033)	(0.018)	(0.026)	(0.038)	(0.028)	(0.033)	(0.062)	(0.032)	(0.042)	(0.061)	(0.036)	(0.037)	(0.079)	(0.084)	(0.046)	(0.046)	0.037*	0.026
Impatience	-0.002	-0.007	0.015	0.029	0.003	0.007	0.002	0.005	0.022	0.028	0.025	0.028	0.009	-0.003	0.015	-0.009	(0.022)	(0.038)
	(0.008)	(0.006)	(0.018)	(0.026)	(0.010)	(0.021)	(0.017)	(0.017)	(0.028)	(0.034)	(0.016)	(0.018)	(0.027)	(0.028)	(0.030)	(0.033)	0.026	-0.005
Financial Risk	0.040***	0.036**	0.010	0.017	0.009	-0.017	0.034***	0.028**	0.015***	0.039***	0.002	-0.021	0.017	0.028**	-0.003	0.014	(0.019)	(0.012)
	(0.011)	(0.017)	(0.011)	(0.011)	(0.029)	(0.031)	(0.012)	(0.012)	(0.006)	(0.007)	(0.036)	(0.041)	(0.014)	(0.013)	(0.009)	(0.025)	0.193***	0.235***
Debt Use	0.131***	0.142**	0.151***	0.160***	0.156***	0.206***	0.200***	0.210***	0.173***	0.183***	0.225***	0.264***	0.321***	0.329***	0.200***	0.290***	(0.049)	(0.076)
	(0.050)	(0.063)	(0.024)	(0.023)	(0.042)	(0.034)	(0.064)	(0.078)	(0.014)	(0.029)	(0.065)	(0.095)	(0.074)	(0.077)	(0.013)	(0.041)	-0.064	-0.147***
Fin Lit Index	-0.097	-0.039	-0.219***	-0.215***	-0.058	-0.050	0.008	0.078	-0.239***	-0.224***	-0.059**	-0.033	0.147	0.188**	-0.264***	-0.346***	(0.049)	(0.040)
	(0.068)	(0.071)	(0.023)	(0.025)	(0.057)	(0.060)	(0.080)	(0.091)	(0.037)	(0.037)	(0.026)	(0.051)	(0.095)	(0.089)	(0.032)	(0.026)	-0.143***	-0.126**
Attentive	-0.036*	-0.027	-0.052***	-0.033***	-0.117***	-0.110***	-0.053***	-0.061***	-0.045**	-0.017	-0.143***	-0.159***	-0.068***	-0.086***	-0.026	0.022	(0.037)	(0.058)
	(0.019)	(0.025)	(0.011)	(0.007)	(0.014)	(0.024)	(0.013)	(0.014)	(0.020)	(0.016)	(0.019)	(0.038)	(0.017)	(0.021)	(0.030)	(0.021)	-0.151***	-0.136***
Gender	-0.034	-0.037	0.028	0.030	0.055	0.077	-0.023	-0.020	-0.033	-0.038	0.010	0.007	-0.155***	-0.140**	-0.060	-0.158**	(0.027)	(0.029)
	(0.045)	(0.049)	(0.020)	(0.031)	(0.047)	(0.051)	(0.046)	(0.047)	(0.033)	(0.048)	(0.032)	(0.038)	(0.043)	(0.056)	(0.060)	(0.079)	-0.000	-0.003
Age	-0.002	-0.002	-0.000	0.000	-0.001	-0.002	-0.002	-0.004*	-0.002	0.000	0.000	-0.002	0.000	-0.001	-0.001	0.002*	(0.006)	(0.006)
	(0.002)	(0.003)	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.005)	(0.004)	(0.002)	(0.003)	(0.001)	(0.001)	0.176*	0.252***
Urban	0.040	0.036	0.037	0.056	0.077**	0.083***	-0.015	0.013	-0.004	0.039	0.098	0.114**	0.045	0.110	-0.043	0.055	(0.093)	(0.062)
	(0.029)	(0.024)	(0.030)	(0.039)	(0.034)	(0.019)	(0.063)	(0.079)	(0.029)	(0.030)	(0.084)	(0.050)	(0.127)	(0.115)	(0.027)	(0.078)	-0.045***	-0.020
Education	-0.032***	-0.032***	-0.001	-0.020*	-0.010	-0.009	-0.041***	-0.048***	0.004	-0.018	-0.029	-0.011	-0.040***	-0.040**	-0.008	-0.053**	(0.016)	(0.018)
	(0.010)	(0.009)	(0.011)	(0.011)	(0.010)	(0.012)	(0.012)	(0.017)	(0.012)	(0.014)	(0.020)	(0.019)	(0.015)	(0.017)	(0.006)	(0.021)	0.033	0.010
Large Expense	0.027	0.019	0.068**	0.056	-0.027	-0.041	0.051	0.019	0.099***	0.083	-0.032	-0.047*	0.015	-0.008	0.092**	0.083**	(0.031)	(0.033)
	(0.040)	(0.036)	(0.033)	(0.044)	(0.021)	(0.034)	(0.052)	(0.064)	(0.020)	(0.069)	(0.022)	(0.025)	(0.050)	(0.053)	(0.040)	(0.038)	0.035	0.059
Credit Card (1=Yes)	0.048	0.024	0.109***	0.126***	0.046	0.052**	0.014	0.001	0.152***	0.126***	-0.000	-0.009	0.049	0.039	0.164***	0.183***	(0.036)	(0.048)
	(0.035)	(0.053)	(0.022)	(0.030)	(0.038)	(0.024)	(0.057)	(0.057)	(0.034)	(0.019)	(0.020)	(0.037)	(0.051)	(0.072)	(0.021)	(0.026)		-0.052
Saving Proportion		0.027***		0.026*		0.012		0.008		0.042***		-0.007		0.008		0.001		(0.034)
		(0.009)		(0.015)		(0.017)		(0.018)		(0.009)		(0.016)		(0.021)		(0.021)		0.045
Cash Constrained		-0.001		-0.019		0.003		0.001		-0.021		0.014		-0.004		-0.033*		(0.038)
		(0.009)		(0.022)		(0.022)		(0.015)		(0.017)		(0.032)		(0.005)		(0.019)		0.014**
Income		-0.020**		-0.021*		-0.015*		-0.020***		-0.030**		-0.010		0.005		-0.002		(0.006)
		(0.009)		(0.012)		(0.008)		(0.006)		(0.013)		(0.009)		(0.013)		(0.013)	263	179
Observations	657	525	654	492	652	481	406	324	403	290	382	291	261	211	293	193	Yes	Yes
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p¡0.01, ** p¡0.05, * p¡0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

6.5 Hypothesis 5: Marketing Negative Nudge

Promotional marketing through behaviourally informed advertising has a positive and significant impact on the choice of expensive cashback mortgage for prospective buyers. The results in Table 11 confirm that the choice of expensive cashback mortgage increases by almost 3.1 percent (significant at 1 percent level) for prospective buyers, as a result of marketing negative nudge.

Table 11: Hypothesis 5, Treatment effect of Marketing Nudge (Treatment 2) pooled three experiments

	Main Analysis		Mortgage Market		Prospective Buyers	
Variables	**(1) Cashback E2.C**	**(2) Cashback E2.C**	**(3) Cashback E2.C**	**(4) Cashback E2.C**	**(5) Cashback E2.C**	**(6) Cashback E2.C**
Treatment 2	0.016	0.018	0.006	0.005	0.031***	0.036***
	(0.015)	(0.018)	(0.011)	(0.013)	(0.006)	(0.012)
Present Bias	0.064***	0.068**	0.051***	0.068***	0.058***	0.058**
	(0.012)	(0.029)	(0.014)	(0.025)	(0.008)	(0.025)
Confidence	-0.008**	-0.003	-0.011	-0.008	-0.010	-0.008
	(0.004)	(0.006)	(0.008)	(0.006)	(0.010)	(0.007)
Lottery1	-0.007	-0.015	0.005	-0.003	0.011	0.016
	(0.015)	(0.021)	(0.029)	(0.028)	(0.036)	(0.029)
Impatience	0.005	0.015***	0.009	0.023***	0.009	0.013*
	(0.007)	(0.006)	(0.010)	(0.009)	(0.008)	(0.008)
Financial Risk	0.047***	0.041***	0.050***	0.041***	0.046***	0.030***
	(0.015)	(0.015)	(0.014)	(0.013)	(0.013)	(0.010)
Debt Use	0.148***	0.154***	0.167***	0.157***	0.187***	0.188***
	(0.018)	(0.019)	(0.026)	(0.029)	(0.008)	(0.013)
Fin Lit Index	-0.120***	-0.117***	-0.113***	-0.090***	-0.102**	-0.086**
	(0.010)	(0.022)	(0.024)	(0.033)	(0.042)	(0.038)
Attentive	-0.043***	-0.035***	-0.032***	-0.033*	-0.031	-0.038
	(0.007)	(0.012)	(0.012)	(0.018)	(0.022)	(0.030)
Gender	0.002	-0.021	-0.011	-0.026	-0.037*	-0.054**
	(0.036)	(0.027)	(0.024)	(0.026)	(0.021)	(0.024)
Age	-0.003**	-0.003**	-0.004**	-0.004**	-0.004**	-0.005***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Urban	0.009	0.034	-0.007	0.033	-0.033	-0.000
	(0.019)	(0.025)	(0.032)	(0.036)	(0.032)	(0.048)
Education	-0.012***	-0.015**	-0.012***	-0.017*	-0.014**	-0.021**
	(0.002)	(0.007)	(0.004)	(0.009)	(0.006)	(0.009)
Large Expense	-0.039**	-0.036***	-0.022*	-0.020***	-0.029***	-0.026**
	(0.016)	(0.011)	(0.013)	(0.006)	(0.006)	(0.011)
Credit Card (1=Yes)	0.058***	0.058**	0.068***	0.058***	0.123***	0.114***
	(0.021)	(0.024)	(0.023)	(0.021)	(0.013)	(0.028)
Saving Proportion		0.006		0.005		-0.010
		(0.011)		(0.012)		(0.007)
Cash Constrained		-0.027***		-0.027***		-0.026***
		(0.002)		(0.004)		(0.008)
Income		0.005		0.007		0.012
		(0.010)		(0.009)		(0.011)
Observations	2,000	1,533	1,315	1,022	920	714
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

Overall, this implies an increase of 1 percent for cashback mortgages across all choices made by prospective buyers of house/mortgage.[44] Furthermore, this result mirrors an increase of 143 cashback mortgages drawn in Ireland in 2017. Again, this result is only a lower bound affect, as our text-based negative nudge simply cannot compete with expensive video-based advertising on television or the internet used by banks. The results from pooled analysis do not hold when the analysis is conducted for each experiment separately (see Table 12). However, the direction of the coefficients is positive and we consider this non-significance a likely result of small sample sizes.

[44] 31.97 percent respondents for subsample of prospective buyers choose cashback mortgage option A in the control group and treatment 2. Therefore effect size of 3.1 percent out of a total of 31.97 percent approximates to 1 percent ($0.031 * 0.3197 = 0.00991$).

Table 12: Hypothesis 5, Treatment effect of Marketing Nudge (Treatment 2) across 3 experiments

	Main Analysis						Mortgage Market						Prospective Buyers					
Variables	**Experiment 1** (1)	(2)	**Experiment 2** (3)	(4)	**Experiment 3** (5)	(6)	**Experiment 1** (7)	(8)	**Experiment 2** (9)	(10)	**Experiment 3** (11)	(12)	**Experiment 1** (13)	(14)	**Experiment 2** (15)	(16)	**Experiment 3** (17)	(18)
Treatment 2 Exp. 1	0.042	0.059					0.014	0.037*					0.004	0.033				
	(0.033)	(0.047)					(0.022)	(0.021)					(0.021)	(0.060)				
Treatment 2 Exp. 2			0.001	-0.019					-0.001	-0.015					0.045	0.018		
			(0.027)	(0.026)					(0.000)	(0.026)					(0.029)	(0.046)		
Treatment 2 Exp. 3					-0.016	-0.021					-0.006	-0.011					0.016	0.002
					(0.022)	(0.032)					(0.032)	(0.033)					(0.044)	(0.037)
Present Bias	0.044	0.039	0.025	0.066	0.156***	0.175***	0.044	0.033	-0.023	-0.002	0.163***	0.202***	0.039	-0.022	-0.023	-0.040	0.216***	0.287***
	(0.042)	(0.041)	(0.050)	(0.051)	(0.040)	(0.011)	(0.039)	(0.033)	(0.000)	(0.026)	(0.040)	(0.030)	(0.042)	(0.062)	(0.045)	(0.069)	(0.057)	(0.029)
Confidence	-0.020	-0.009	-0.016**	-0.010	0.011	0.006	0.003	0.016	-0.021	-0.016	0.001	-0.006	0.012	0.029	-0.002	0.013	0.005	-0.006
	(0.015)	(0.007)	(0.007)	(0.012)	(0.009)	(0.014)	(0.024)	(0.016)	(0.000)	(0.019)	(0.012)	(0.017)	(0.022)	(0.022)	(0.011)	(0.025)	(0.011)	(0.012)
Lottery1	0.000	-0.059**	0.001	0.011	-0.044	-0.027	-0.020	-0.063	-0.018	-0.036	-0.004	-0.019	-0.039	-0.094**	0.034	-0.060	-0.068	-0.055
	(0.023)	(0.030)	(0.056)	(0.060)	(0.029)	(0.029)	(0.024)	(0.047)	(0.000)	(0.042)	(0.053)	(0.037)	(0.054)	(0.048)	(0.036)	(0.045)	(0.057)	(0.062)
Impatience	0.013	0.016**	-0.002	0.015	-0.004	0.017	0.010	0.014	0.013	0.029	0.007	0.045*	0.006	-0.018	-0.019	-0.046	0.030	0.061**
	(0.015)	(0.008)	(0.011)	(0.018)	(0.018)	(0.023)	(0.008)	(0.024)	(0.000)	(0.038)	(0.029)	(0.023)	(0.012)	(0.026)	(0.022)	(0.029)	(0.033)	(0.027)
Financial Risk	0.051**	0.042*	0.068***	0.067***	0.032**	0.024***	0.048***	0.036*	0.075	0.084***	0.054***	0.045***	0.029	0.034	0.067***	0.066***	0.065***	0.022
	(0.021)	(0.024)	(0.013)	(0.015)	(0.016)	(0.008)	(0.018)	(0.022)	(0.000)	(0.022)	(0.012)	(0.015)	(0.027)	(0.033)	(0.007)	(0.023)	(0.014)	(0.029)
Debt Use	0.160***	0.161***	0.154***	0.162***	0.148***	0.198***	0.184***	0.197***	0.175	0.129**	0.171***	0.215***	0.222***	0.274***	0.278***	0.302***	0.128***	0.160***
	(0.040)	(0.041)	(0.020)	(0.036)	(0.040)	(0.057)	(0.040)	(0.046)	(0.000)	(0.054)	(0.056)	(0.064)	(0.046)	(0.015)	(0.022)	(0.038)	(0.034)	(0.050)
Fin Lit Index	-0.096	-0.128	-0.121***	-0.100***	-0.131***	-0.126***	-0.076	-0.077	-0.153	-0.130**	-0.095**	-0.075***	-0.038	0.023	-0.158***	-0.067**	-0.102**	-0.095***
	(0.060)	(0.083)	(0.039)	(0.024)	(0.012)	(0.044)	(0.058)	(0.090)	(0.000)	(0.053)	(0.043)	(0.022)	(0.043)	(0.092)	(0.033)	(0.027)	(0.047)	(0.028)
Attentive	-0.016	-0.009	-0.033	-0.019	-0.070***	-0.075***	-0.021	-0.022	-0.026	-0.006	-0.062**	-0.083*	-0.071*	-0.086**	-0.014	0.051**	-0.048	-0.111**
	(0.023)	(0.028)	(0.021)	(0.019)	(0.007)	(0.017)	(0.023)	(0.023)	(0.000)	(0.018)	(0.031)	(0.046)	(0.042)	(0.041)	(0.025)	(0.022)	(0.030)	(0.047)
Gender	-0.002	-0.019	-0.007	-0.007	-0.006	-0.041	0.023	0.036	-0.077	-0.081**	-0.022	-0.074**	0.014	-0.006	-0.106***	-0.162**	-0.053*	-0.120***
	(0.086)	(0.075)	(0.041)	(0.040)	(0.011)	(0.025)	(0.073)	(0.061)	(0.000)	(0.036)	(0.027)	(0.030)	(0.081)	(0.049)	(0.029)	(0.077)	(0.027)	(0.034)
Age	-0.003***	-0.002**	-0.002	-0.002	-0.005*	-0.007**	-0.005***	-0.005**	-0.003	-0.005*	-0.006	-0.010*	-0.004***	-0.004***	-0.002***	-0.005	-0.009	-0.013*
	(0.000)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.000)	(0.003)	(0.004)	(0.005)	(0.002)	(0.001)	(0.001)	(0.005)	(0.007)	(0.008)
Urban	0.011	0.034	0.053	0.101*	-0.024	-0.047	-0.034	0.011	0.016	0.073**	-0.006	0.039	-0.001	0.014	0.047	0.083	-0.032	-0.015
	(0.013)	(0.037)	(0.033)	(0.052)	(0.040)	(0.029)	(0.028)	(0.046)	(0.000)	(0.031)	(0.075)	(0.064)	(0.077)	(0.116)	(0.036)	(0.103)	(0.092)	(0.125)
Education	-0.007	-0.012	-0.007	-0.021**	-0.006	-0.000	-0.013	-0.022	-0.002	-0.028**	-0.009	0.000	-0.014	-0.000	-0.007	-0.061*	-0.015	0.007
	(0.007)	(0.010)	(0.008)	(0.010)	(0.009)	(0.011)	(0.013)	(0.019)	(0.000)	(0.012)	(0.009)	(0.010)	(0.020)	(0.021)	(0.014)	(0.034)	(0.012)	(0.022)
Large Expense	-0.017	-0.005	-0.042***	-0.066***	-0.072**	-0.060**	-0.008	-0.027	-0.008	-0.050*	-0.088*	-0.056	-0.043	-0.083*	-0.037	-0.091	-0.097***	-0.040
	(0.036)	(0.030)	(0.016)	(0.019)	(0.032)	(0.029)	(0.036)	(0.030)	(0.000)	(0.027)	(0.049)	(0.045)	(0.052)	(0.050)	(0.024)	(0.062)	(0.036)	(0.037)
Credit Card (1=Yes)	0.071*	0.086**	0.018	0.013	0.067**	0.063	0.088	0.108**	0.072	0.089**	0.067**	0.053**	0.166***	0.206***	0.110***	0.202***	0.134***	0.127***
	(0.040)	(0.041)	(0.028)	(0.024)	(0.029)	(0.046)	(0.069)	(0.049)	(0.000)	(0.040)	(0.027)	(0.022)	(0.062)	(0.031)	(0.031)	(0.055)	(0.023)	(0.022)
Saving Proportion		0.010		0.013		-0.020**		0.015		0.023		-0.029*		0.009		-0.015		-0.026**
		(0.013)		(0.012)		(0.010)		(0.022)		(0.022)		(0.015)		(0.021)		(0.025)		(0.011)
Cash Constrained		-0.030***		-0.045***		0.004		-0.028***		-0.055***		0.017***		-0.056***		-0.062***		0.030***
		(0.007)		(0.014)		(0.014)		(0.007)		(0.020)		(0.005)		(0.018)		(0.017)		(0.009)
Income		0.003		0.019**		0.001		-0.015		0.024*		0.006		-0.018		0.037		0.017
		(0.013)		(0.008)		(0.007)		(0.018)		(0.013)		(0.014)		(0.016)		(0.025)		(0.029)
Observations	665	524	657	482	651	474	403	310	429	311	432	319	272	209	293	196	278	208
Demography Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p¡0.01, ** p¡0.05, * p¡0.1
Main Analysis: All categories for House/Mortgage Purchase or Plan
Mortgage Market: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years
Prospective Buyers: Respondents planning to purchase a House or a Mortgage in next 15 Years.

7 Conclusion

Marketeers have distracted consumers for centuries with discounts and special offers. Sometimes consumers get good deals and sometimes the so-called deal is not as good as it seems. We have documented how in recent years cashbacks have become a prominent of mortgage and credit card markets across a number of countries. Crucially, we find that in many contexts (Ireland and the UK for mortgages and Australia, Canada, New Zealand and the UK for credit cards) cashbacks are used to attract consumers to higher cost financial products, and while there is some evidence that regulators are aware of this, little has been done to protect consumers.

In this paper, through an experiment on the Irish mortgage market we show that behaviourally informed comparative product price information at the point of sale is effective in changing consumer preferences away from expensive cashback mortgages. We suggest this is rationale for a more interventionist form of regulation, where behavioural insights are used to help consumers make better long-term financial decisions. We also find evidence that simple marketing works to attract more vulnerable groups into cashback mortgages. This finding heightens the rationale for greater consumer protection.

Protection of consumers from expensive cashback offers, through policy, can take a number of forms. One extreme is the prohibition of cashback mortgages, a direction that has been muted in Ireland among policy makers in early 2018. Regulators, who typically prefer to regulate the flow of information between financial institutions and consumers, may instead prefer to heed the direct conclusion of this paper that price comparison information at the point of sale alters consumer preference away from expensive cashback mortgages. For cashback mortgages, mortgage switching regulations also matter. Policies that encourage mortgage switching help cashback mortgage holders move off higher interest rate products.

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Appendices

A Variables used in the study

1) Gender: Dummy variable taking the value as one if Male and zero if Female.

2) Age: The age of respondents (in Years).

3) Social Class: The categorical variable taking values from 1 to 7 for the following social classes; 1: A, 2: B, 3:C1, 4:C2, 5: D, 6: E, 7:F50+, and 8: F<50. The entire population of Ireland is distributed into one of the following groups. A: Professional Workers, B: Managerial and Technical, C: Non-manual, D: Skilled manual, E: Semi-skilled, and F: Unskilled.

4) Urban: Dummy variable taking value one if the respondent belongs to a city or town, and zero if from rural area.

5) Civil Status: Categorical Variable taking following values; 1: Married, 2: Widowed/Separated/Divorced, 3: Living with a Partner, 4: Single 5: Single Parent, 6: In relationship but not living together, and 7: Other.

6) Total Children: Number of children below 18 years of age.

7) Employment Status: Categorical variable taking the following values; 1: Full-time, 2: Part-time, 3: Full-time Student, 4: Look after Home, 5: Student in Part time employment, 6: Unemployed looking for a job, 7: Retired, 8: Self-employed, and 9: Other.

8) Occupation: Categorical variable taking the following values; 1: Higher managerial/ professional/ administrative, 2: Intermediate managerial/ professional/ administrative, 3: Supervisory or clerical/ junior manager, 4: Student, 5: Skilled Manual Labour, 6: Semi or unskilled manual work, 7: Casual worker – not in permanent employment, 8: Looking after home and family full time, 9: Retired (state pension only), 10: Self-employed, 11: Unemployed or not working due to long term illness, 12: Farmer (50+ Acres), 13: Farmer (<50 Acres), and 14: Retired (private pension – contributory)

9) Education: Categorical variable taking values from 1 to 8 on an increasing scale; 1: No formal Education, 2: Completed Primary, 3: Completed Secondary, 4: Technical/vocational/certificate, 5: Ordinary Bachelor's Degree, 6: Honours Bachelor's Degree, 7: Postgraduate diploma or degree, and 8: Doctorate (Ph. D.).

10) Income: categorical variable taking values from 1 to 10 on an increasing scale; 1: 0-20,000, 2: 21,000-40,000, 3: 41,000-60,000, 4: 61,000-80,000, 5: 81,000-100,000, 6: 101,000-120,000, 7: 121,000-140,000, 8: 141,000-160,000, 9: 161,000-180,000, and 10: Over 180,000.

11) Proportion of Income Saved: Categorical variable taking values from 1 to 6 on an increasing scale, 1: 0%, 2: 1-5%, 3: 6-10%, 4: 11-20%, 5: 21-30%, and 6: Over 30%.

12) Foresee Large Expenses: Dummy variable taking the value as one if respondent foresees large expenses such as Car, College Fees, Starting a Family, Wedding, Large Gift, Home Renovation, and Other expenses in coming years.

13) Loans: Total number of loans with the respondent.

14) Credit Card: Dummy variable taking the value as one of the respondent has a credit card, and zero otherwise.

15) Present-bias: Dummy variable taking the value as one if intertemporal discount factor for smaller immediate reward is higher in the first price list as compared to the second price, and zero otherwise (Time-consistent or Future Biased). Revealed preference measure for present bias.

16) Impatience: Self-perceived measure of present-bias taking values on a decreasing scale from 1 to 5; 1: Very Patient, 2, 3, 4 5: Very Patient.

17) Financial Risk: Self-perceived measure indicating financial riskiness on an increasing scale from 1 to 5; 1: Not willing to take Risk, 2, 3, 4, 5: Take substantial risk for substantial returns.

18) Debt-Use: Dummy variable taking the value as one if a respondent prefers a loan at the interest rate of 3 percent for purchasing a table/mobile phone instead of saving for 6 months.

19) Confidence: Variable recording the individual perception of total number of correct answers in the range questions asked in the survey. Total questions asked=5.

20) Financial Literacy Index: Variable recording total number of correct answers for the financial literacy questions. The variable gives weight of 0.50 for each correct answer.

21) Attentiveness: Variable recording total number of correct answers for the questions on Cognitive Reflection Test (CRT).

22) Lottery: Dummy variable taking the value as one if a respondent agrees to play a lottery of €750 with a 10% chance and takes the value as zero if the respondents prefers to take a certain pay-off of €50. Used as a revealed preference measure for appetite for risk.

23) Cash-constrained: Categorical variable taking the value from 1 to 5 on a decreasing scale; 1: A Great Deal, 2: A lot, 3: Moderately, 4: A little, 5: None.

24) Living Status: Categorical variable taking the followings values, 1: With partner with NO children living at home, 2: With partner with children living at home, 3: With children, without a partner, 4: Multi-generational household with grandparents, parents, children or other relatives in the home, 5: Live with parents and/or siblings, 6: Apartment or house share – that is living with

adults to whom you are not related, 7: Living alone, 8: Others.

25) Expect Inheritance: Dummy variable taking value as one if expect inheritance and zero otherwise.

26) Tend to live for today: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

27) Advertising affects your purchase: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

28) Carefully consider purchases: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

29) Keep Close watch on Spending: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

30) Set Long Term Financial Goals: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

31) Have Household Budge: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

32) Affected by Opinions of Others: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

33) Satisfying to spend money rather than save: Increasing scale from 1 to 7 where 1: Do not Agree and 7: Strongly agree.

34) Treatment 1: The treatment variable for advanced disclosure. Takes value one if the respondent belongs to arms E1.1, E2.1, E3.1 and zero if the respondent belongs to E1.C, E2.C, and E3.C.

35) Treatment 2: The treatment variable for negative marketing nudge. Takes value if the respondent belongs to arms E1.2, E2.2, E3.2 and zero if the respondent belongs to E1.C, E2.C, and E3.C.

36) Subsample 1: Respondents purchased a House or Mortgage in 15 Years or plan to purchase a House or Mortgage in next 15 Years

37) Subsample 2: Respondents planning to purchase a House or a Mortgage in next 15 Years.

38) Cashback: Dummy variable taking the value as one if the respondents choose expensive cashback mortgage and zero if the respondent chooses a low-cost mortgage.

B Additional Descriptive Statistics

Table 13: Balance in the Control, Treatment 1 and Treatment 2 for Experiment 1

	Control Group Versus Treatment 1 (N=667)				Control Group Versus Treatment 2 (N=665)			
	Mean (N=332) (Control)	**Mean (N=335) (T1)**	**Diff.**	**P-value**	**Mean (N=332) (Control)**	**Mean (N=333) (T2)**	**Diff.**	**P-value**
1=Male, 0=Female	0.47	0.46	0.01	0.79	0.47	0.52	-0.05	0.18
Exact Age	45.54	44.82	0.72	0.52	45.54	43.90	1.64	0.15
Occupational Group	5.67	5.42	0.25	0.35	5.67	5.30	0.37	0.16
Social Class: A to F	3.70	3.77	-0.07	0.53	3.70	3.67	0.03	0.80
1=Urban 0=Rural	0.70	0.74	-0.04	0.31	0.70	0.71	-0.01	0.85
Marital Status	2.25	2.30	-0.05	0.69	2.25	2.19	0.06	0.60
Number of Children	0.90	0.93	-0.02	0.82	0.90	0.91	-0.00	0.97
Employment Status	3.47	3.04	0.43*	0.03	3.47	3.28	0.19	0.33
Purchased House	3.64	3.69	-0.05	0.65	3.64	3.64	0.00	0.99
Purchased Mortgage	3.95	4.01	-0.07	0.49	3.95	3.92	0.03	0.74
Plan Mortgage	3.16	3.15	0.01	0.91	3.16	3.11	0.05	0.61
Plan House Purchase	2.96	2.97	-0.02	0.88	2.96	2.92	0.03	0.74
Education	4.43	4.45	-0.02	0.84	4.43	4.42	0.00	0.97
Household Income	2.67	2.74	-0.07	0.58	2.67	2.66	0.01	0.92
Proportion of Income Saved	2.67	2.70	-0.03	0.79	2.67	2.80	-0.13	0.27
Cash Constrained Intensity	2.83	2.80	0.03	0.75	2.83	3.03	-0.20*	0.04
Foresee large expense	0.39	0.43	-0.04	0.32	0.39	0.33	0.06	0.10
Total Number of Loans	0.71	0.64	0.08	0.24	0.71	0.64	0.07	0.26
Has Credit Card?	0.62	0.64	-0.02	0.68	0.62	0.65	-0.03	0.45
Present Bias detected	0.27	0.24	0.04	0.30	0.27	0.28	-0.01	0.81
Level of Impatience	3.30	3.45	-0.15	0.08	3.30	3.32	-0.02	0.82
Financial Riskiness	2.47	2.47	-0.00	0.98	2.47	2.49	-0.01	0.87
Debt-Use	0.17	0.17	-0.00	0.96	0.17	0.20	-0.04	0.24
Confidence	1.55	1.35	0.21*	0.06	1.55	1.53	0.03	0.80
Index of Fin. Literacy	0.48	0.44	0.05	0.12	0.48	0.46	0.02	0.44
Index on Attentiveness	0.73	0.72	0.01	0.87	0.73	0.61	0.12*	0.09

Table 14: Balance in the Control, Treatment 1 and Treatment 2 for Experiment 2

	Control Group Versus Treatment 1 (N=665)				Control Group Versus Treatment 2 (N=668)			
	Mean (N=333) (Control)	**Mean (N=332) (T1)**	**Diff.**	**P-value**	**Mean (N=333) (Control)**	**Mean (N=335) (T2)**	**Diff.**	**P-value**
1=Male, 0=Female	0.49	0.49	-0.01	0.85	0.49	0.53	-0.04	0.25
Exact Age	44.47	44.07	0.39	0.75	44.47	43.96	0.51	0.66
Occupational Group	5.62	5.61	0.01	0.96	5.62	5.37	0.25	0.33
Social Class: A to F	3.74	3.83	-0.09	0.44	3.74	3.73	0.01	0.95
1=Urban 0=Rural	0.74	0.77	-0.02	0.49	0.74	0.73	0.02	0.63
Marital Status	2.15	2.30	-0.15	0.21	2.15	2.28	-0.12	0.29
Number of Children	0.78	0.94	-0.16*	0.08	0.78	0.88	-0.10	0.25
Employment Status	3.29	3.35	-0.06	0.78	3.29	3.00	0.29	0.13
Purchased House	3.62	3.65	-0.03	0.79	3.62	3.67	-0.04	0.69
Purchased Mortgage	3.93	4.05	-0.12	0.23	3.93	3.95	-0.02	0.80
Plan Mortgage	3.15	3.10	0.06	0.55	3.15	3.13	0.02	0.84
Plan House Purchase	2.93	2.90	0.03	0.78	2.93	2.92	0.01	0.88
Education	4.44	4.56	-0.12	0.32	4.44	4.47	-0.03	0.78
Household Income	2.69	2.69	-0.00	0.99	2.69	2.71	-0.02	0.90
Proportion of Income Saved	2.81	2.79	0.03	0.81	2.81	2.89	-0.07	0.53
Cash Constrained Intensity	2.81	2.85	-0.05	0.63	2.81	3.05	-0.24**	0.02
Foresee large expense	0.39	0.37	0.02	0.54	0.39	0.38	0.01	0.76
Total Number of Loans	0.63	0.69	-0.07	0.34	0.63	0.64	-0.01	0.83
Has Credit Card?	0.66	0.65	0.01	0.85	0.66	0.67	-0.02	0.64
Present Bias detected	0.30	0.25	0.05	0.12	0.30	0.21	0.09**	0.01
Level of Impatience	3.24	3.38	-0.14	0.10	3.24	3.37	-0.14	0.12
Financial Riskiness	2.44	2.52	-0.09	0.32	2.44	2.50	-0.06	0.52
Debt-Use	0.15	0.20	-0.05	0.10	0.15	0.13	0.01	0.63
Confidence	1.55	1.64	-0.09	0.45	1.55	1.67	-0.12	0.28
Index of Fin. Literacy	0.47	0.45	0.02	0.55	0.47	0.47	-0.00	0.99
Index on Attentiveness	0.55	0.72	-0.17**	0.02	0.55	0.67	-0.12	0.10

Table 15: Balance in the Control, Treatment 1 and Treatment 2 for Experiment 3

	Control Group Versus Treatment 1 (N=668)				Control Group Versus Treatment 2 (N=667)			
	Mean (N=335) (Control)	Mean (N=333) (T1)	Diff.	P-value	Mean (N=335) (Control)	Mean (N=332) (T2)	Diff.	P-value
1=Male, 0=Female	0.48	0.52	-0.04	0.32	0.48	0.49	-0.01	0.79
Exact Age	43.32	45.36	-2.04*	0.09	43.32	43.56	-0.24	0.84
Occupational Group	5.60	5.79	-0.19	0.49	5.60	5.65	-0.05	0.85
Social Class: A to F	3.76	3.85	-0.08	0.47	3.76	3.73	0.03	0.79
1=Urban 0=Rural	0.74	0.68	0.06*	0.08	0.74	0.68	0.06*	0.09
Marital Status	2.35	2.32	0.03	0.80	2.35	2.45	-0.11	0.38
Number of Children	0.90	0.81	0.09	0.33	0.90	0.85	0.05	0.62
Employment Status	3.27	3.29	-0.02	0.93	3.27	3.31	-0.04	0.84
Purchased House	3.84	3.77	0.06	0.53	3.84	3.71	0.12	0.25
Purchased Mortgage	4.09	4.05	0.04	0.69	4.09	4.04	0.05	0.59
Plan Mortgage	3.17	3.24	-0.07	0.42	3.17	3.13	0.04	0.68
Plan House Purchase	2.99	3.04	-0.05	0.58	2.99	2.91	0.08	0.41
Education	4.44	4.39	0.05	0.69	4.44	4.47	-0.03	0.79
Household Income	2.73	2.76	-0.03	0.85	2.73	2.57	0.16	0.21
Proportion of Income Saved	2.82	2.70	0.11	0.33	2.82	2.73	0.08	0.48
Cash Constrained Intensity	2.98	2.86	0.12	0.24	2.98	3.03	-0.06	0.58
Foresee large expense	0.36	0.36	0.00	0.92	0.36	0.42	-0.06	0.11
Total Number of Loans	0.60	0.62	-0.02	0.69	0.60	0.57	0.03	0.56
Has Credit Card?	0.64	0.67	-0.02	0.55	0.64	0.67	-0.02	0.57
Present Bias detected	0.30	0.23	0.07*	0.05	0.30	0.22	0.08*	0.02
Level of Impatience	3.33	3.30	0.03	0.73	3.33	3.39	-0.06	0.46
Financial Riskiness	2.51	2.46	0.05	0.60	2.51	2.50	0.01	0.93
Debt-Use	0.20	0.14	0.05	0.07	0.20	0.19	0.01	0.74
Confidence	1.50	1.62	-0.12	0.33	1.50	1.66	-0.16	0.17
Index of Fin. Literacy	0.43	0.41	0.02	0.40	0.43	0.43	-0.00	0.90
Index on Attentiveness	0.69	0.67	0.01	0.85	0.69	0.58	0.11	0.14

Table 16: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for Experiments 1, 2, and 3 (Main Analysis 100% Data)

	Experiment 1,2,3: Control (N=1,000)				Experiment 1,2,3: Treatment 1 (N=1,000)				Experiment 1,2,3: Treatment 2 (N=1,000)			
	No-cashback Mean (N=749)	Cashback Mean (N=251)	Difference	P-value	No-cashback Mean (N=786)	Cashback Mean (N=214)	Difference	P-value	No-cashback Mean (N=725)	Cashback Mean (N=275)	Difference	P-value
1=Male, 0=Female	0.47	0.49	-0.02	0.63	0.48	0.52	-0.04	0.26	0.52	0.48	0.04	0.25
Exact Age	45.79	40.41	5.37***	0.00	44.68	45.03	-0.35	0.76	45.22	40.07	5.15***	0.00
Social Class: A to F	3.7	3.83	-0.13	0.25	3.8	3.86	-0.06	0.62	3.68	3.79	-0.1	0.3
1=Urban 0=Rural	0.72	0.74	-0.02	0.62	0.7	0.81	-0.11***	0.00	0.69	0.76	-0.07**	0.03
Marital Status	2.27	2.19	0.08	0.49	2.31	2.28	0.03	0.8	2.24	2.49	-0.25**	0.02
Children below 18 Years	0.76	1.16	-0.40***	0.00	0.9	0.87	0.03	0.74	0.77	1.17	-0.40***	0.00
Employment Status	3.46	2.98	0.48**	0.01	3.27	3.05	0.22	0.25	3.31	2.89	0.41**	0.02
Highest level of Education	4.46	4.35	0.12	0.29	4.49	4.39	0.09	0.43	4.48	4.4	0.08	0.46
Household Income	2.70	2.66	0.03	0.76	2.74	2.67	0.07	0.60	2.66	2.59	0.06	0.57
Proportion of Income Saved	2.72	2.88	-0.15	0.17	2.69	2.84	-0.14	0.19	2.78	2.86	-0.08	0.44
Cash Constrained (Decreasing)	2.94	2.64	0.30***	0.00	2.83	2.83	0.00	0.94	3.13	2.78	0.35***	0.00
Foresee large Expenses	0.37	0.41	-0.04	0.29	0.38	0.42	-0.04	0.24	0.38	0.37	0.01	0.67
Total Number of Loans	0.62	0.74	-0.13**	0.04	0.62	0.76	-0.13**	0.04	0.58	0.72	-0.15**	0.01
Has Credit Card?	0.62	0.72	-0.11***	0.00	0.63	0.72	-0.09**	0.01	0.65	0.69	-0.04	0.27
Present Bias	0.27	0.36	-0.09**	0.01	0.23	0.26	-0.03	0.38	0.21	0.3	-0.09***	0.00
Impatience (Decreasing)	3.3	3.28	0.02	0.84	3.39	3.32	0.08	0.38	3.35	3.39	-0.03	0.66
Fin. Riskiness (Increasing)	2.36	2.82	-0.46***	0.00	2.44	2.66	-0.22**	0.01	2.36	2.84	-0.48***	0.00
Debt-Use	0.11	0.34	-0.23***	0.00	0.14	0.29	-0.15***	0.00	0.13	0.31	-0.18***	0.00
Confidence (Increasing)	1.54	1.53	0	0.99	1.52	1.6	-0.09	0.46	1.67	1.48	0.20*	0.06
Fin. Literacy (Increasing)	0.49	0.34	0.15***	0.00	0.46	0.30	0.16***	0.00	0.50	0.32	0.17***	0.00
Attentiveness (Increasing)	0.76	0.34	0.43***	0.00	0.79	0.39	0.40***	0.00	0.69	0.43	0.26***	0.00
Expect Inheritance	0.27	0.34	-0.06*	0.07	0.27	0.3	-0.03	0.43	0.26	0.34	-0.08**	0.03
Tend to Live for today (Increasing)	3.28	4.08	-0.80***	0.00	3.41	3.75	-0.34**	0.01	3.36	3.83	-0.47***	0.00
Advertising affect your purchase? (Increasing)	3.04	3.77	-0.73***	0.00	3.13	3.57	-0.44***	0.00	3.13	3.68	-0.55***	0.00
Carefully consider purchases (Increasing)	5.16	4.84	0.32***	0.00	5.15	4.86	0.28**	0.01	5.15	4.81	0.34***	0.00
Keep close watch on Spending (Increasing)	5.64	5.2	0.43***	0.00	5.61	5.19	0.43***	0.00	5.63	5.31	0.32***	0.00
Set Long Term Financial Goals (Increasing)	4.69	4.66	0.03	0.78	4.69	4.59	0.1	0.42	4.73	4.72	0.01	0.95
Have Household Budget (Increasing)	4.72	4.84	-0.13	0.31	4.86	4.79	0.08	0.55	4.79	4.84	-0.05	0.66
How much does opinion of others affect your behaviour? (Increasing)	3.02	3.72	-0.70***	0.00	3.03	3.43	-0.41***	0.00	3.1	3.51	-0.41***	0.00
More satisfying to spend money then save (Increasing)	3.41	4.05	-0.64***	0.00	3.52	3.81	-0.29**	0.03	3.45	3.91	-0.46***	0.00

Table 17: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for Experiment 1 (Main Analysis 100% Data)

	Experiment 1: Control (N=332)				Experiment 1: Treatment 1 (N=335)				Experiment 1: Treatment 2 (N=333)			
	No-cashback Mean (N=255)	Cashback Mean (N=77)	Difference	P-value	No-cashback Mean (N=268)	Cashback Mean (N=67)	Difference	P-value	No-cashback Mean (N=230)	Cashback Mean (N=103)	Difference	P-value
1=Male, 0=Female	0.46	0.48	-0.02	0.78	0.47	0.39	0.09	0.21	0.55	0.45	0.11*	0.08
Exact Age	46.81	41.35	5.46***	0.00	45.03	43.97	1.06	0.59	44.96	41.52	3.44*	0.05
Social Class: A to F	3.64	3.88	-0.24	0.22	3.74	3.88	-0.14	0.48	3.57	3.88	-0.31*	0.08
1=Urban 0=Rural	0.69	0.73	-0.03	0.58	0.73	0.78	-0.05	0.42	0.70	0.73	-0.03	0.60
Marital Status	2.23	2.31	-0.08	0.69	2.29	2.34	-0.06	0.79	2.17	2.23	-0.06	0.72
Children below 18 Years	0.75	1.41	-0.65***	0.00	0.96	0.80	0.15	0.35	0.73	1.29	-0.57***	0.00
Employment Status	3.60	3.03	0.58*	0.09	3.03	3.07	-0.04	0.90	3.46	2.86	0.60*	0.05
Highest level of Education	4.48	4.26	0.22	0.27	4.53	4.15	0.38*	0.07	4.41	4.45	-0.03	0.86
Household Income	3.98	3.74	0.24	0.58	3.87	3.79	0.08	0.86	4.20	3.74	0.47	0.25
Proportion of Income Saved	3.04	3.14	-0.11	0.66	3.08	3.61	-0.53**	0.04	3.34	3.40	-0.06	0.80
Cash Constrained (Decreasing)	3.02	2.87	0.15	0.41	3.04	3.09	-0.05	0.80	3.42	3.00	0.42**	0.01
Foresee large Expenses	0.36	0.48	-0.12*	0.07	0.44	0.40	0.03	0.62	0.34	0.31	0.03	0.61
Total Number of Loans	0.68	0.83	-0.15	0.18	0.62	0.69	-0.06	0.58	0.57	0.80	-0.23**	0.02
Has Credit Card?	0.61	0.68	-0.07	0.29	0.62	0.70	-0.08	0.23	0.63	0.69	-0.05	0.34
Present Bias	0.24	0.36	-0.12**	0.04	0.22	0.31	-0.10*	0.09	0.28	0.28	-0.00	0.95
Impatience (Decreasing)	3.33	3.23	0.09	0.52	3.49	3.31	0.17	0.24	3.31	3.36	-0.05	0.71
Fin. Riskiness (Increasing)	2.37	2.81	-0.43***	0.00	2.41	2.73	-0.32*	0.05	2.38	2.72	-0.34**	0.01
Debt-Use	0.12	0.32	-0.20***	0.00	0.14	0.30	-0.16***	0.00	0.16	0.31	-0.15**	0.00
Confidence (Increasing)	1.62	1.34	0.28	0.13	1.37	1.24	0.13	0.49	1.58	1.40	0.18	0.28
Fin. Literacy (Increasing)	0.50	0.37	0.13**	0.02	0.46	0.22	0.24***	0.00	0.48	0.33	0.15***	0.00
Attentiveness (Increasing)	0.82	0.45	0.37***	0.00	0.81	0.39	0.42***	0.00	0.69	0.45	0.24*	0.02
Expect Inheritance	0.26	0.32	-0.05	0.39	0.26	0.31	-0.05	0.46	0.29	0.35	-0.06	0.31
Tend to Live for today (Increasing)	3.18	4.10	-0.93***	0.00	3.31	3.84	-0.53*	0.02	3.33	3.59	-0.26	0.20
Advertising affect your purchase? (Increasing)	2.97	3.45	-0.49**	0.02	3.15	3.54	-0.38*	0.09	3.03	3.53	-0.50**	0.01
Carefully consider purchases (Increasing)	5.18	4.82	0.37*	0.06	5.32	4.75	0.57***	0.00	5.19	4.72	0.47***	0.00
Keep close watch on Spending (Increasing)	5.56	5.19	0.37*	0.05	5.70	5.01	0.69***	0.00	5.62	5.45	0.18	0.28
Set Long Term Financial Goals (Increasing)	4.62	4.44	0.17	0.39	4.81	4.43	0.37*	0.09	4.69	4.72	-0.03	0.89
Have Household Budget (Increasing)	4.69	4.96	-0.27	0.20	4.96	4.69	0.28	0.22	4.78	5.00	-0.22	0.24
How much does opinion of others affect your behaviour? (Increasing)	3.08	3.52	-0.44**	0.03	3.06	3.37	-0.31	0.14	2.97	3.46	-0.49**	0.01
More satisfying to spend money then save (Increasing)	3.37	3.74	-0.37*	0.08	3.42	3.90	-0.47**	0.04	3.30	3.67	-0.37*	0.06

Table 18: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for Experiment 2 (Main Analysis 100% Data)

	Experiment 2: Control (N=333)				Experiment 2: Treatment 1 (N=332)				Experiment 2: Treatment 2 (N=335)			
	No-cashback Mean (N=256)	Cashback Mean (N=77)	Difference	P-value	No-cashback Mean (N=265)	Cashback Mean (N=67)	Difference	P-value	No-cashback Mean (N=255)	Cashback Mean (N=80)	Difference	P-value
1=Male, 0=Female	0.48	0.52	-0.04	0.51	0.47	0.58	-0.11	0.11	0.55	0.49	0.06	0.37
Exact Age	45.85	39.87	5.98***	0.00	43.74	45.37	-1.63	0.44	44.95	40.79	4.17**	0.02
Social Class: A to F	3.77	3.65	0.12	0.54	3.81	3.93	-0.12	0.56	3.75	3.70	0.05	0.80
1=Urban 0=Rural	0.74	0.75	-0.01	0.79	0.74	0.85	-0.11*	0.06	0.69	0.82	-0.13**	0.02
Marital Status	2.19	2.04	0.15	0.45	2.29	2.33	-0.03	0.87	2.22	2.46	-0.24	0.22
Children below 18 Years	0.67	1.16	-0.50***	0.00	0.91	1.07	-0.17	0.34	0.83	1.04	-0.21	0.15
Employment Status	3.41	2.91	0.50	0.13	3.43	3.03	0.40	0.25	3.05	2.83	0.23	0.46
Highest level of Education	4.46	4.35	0.11	0.56	4.54	4.61	-0.07	0.74	4.49	4.41	0.08	0.69
Household Income	3.83	3.43	0.40	0.33	4.07	4.19	-0.13	0.79	4.36	4.47	-0.11	0.81
Proportion of Income Saved	3.34	3.40	-0.06	0.80	3.22	3.45	-0.23	0.38	3.39	3.54	-0.15	0.55
Cash Constrained (Decreasing)	3.14	2.71	0.43**	0.03	3.05	3.19	-0.14	0.47	3.30	3.20	0.10	0.58
Foresee large Expenses	0.38	0.44	-0.06	0.33	0.34	0.48	-0.13*	0.04	0.39	0.35	0.04	0.50
Total Number of Loans	0.56	0.84	-0.28**	0.01	0.68	0.76	-0.09	0.48	0.62	0.72	-0.11	0.29
Has Credit Card?	0.62	0.79	-0.18***	0.00	0.62	0.79	-0.18**	0.01	0.68	0.65	0.03	0.59
Present Bias	0.29	0.32	-0.03	0.60	0.25	0.25	-0.01	0.89	0.19	0.26	-0.07	0.18
Impatience (Decreasing)	3.25	3.21	0.04	0.80	3.35	3.48	-0.12	0.42	3.33	3.50	-0.17	0.24
Fin. Riskiness (Increasing)	2.30	2.90	-0.60***	0.00	2.50	2.63	-0.13	0.38	2.33	3.02	-0.70***	0.00
Debt-Use	0.09	0.35	-0.26***	0.00	0.16	0.33	-0.17***	0.00	0.09	0.26	-0.17***	0.00
Confidence (Increasing)	1.53	1.64	-0.11	0.56	1.59	1.84	-0.24	0.26	1.79	1.31	0.48**	0.01
Fin. Literacy (Increasing)	0.48	0.29	0.19***	0.00	0.46	0.25	0.21***	0.00	0.46	0.32	0.14**	0.01
Attentiveness (Increasing)	0.63	0.27	0.36***	0.00	0.79	0.43	0.36**	0.01	0.73	0.46	0.27**	0.03
Expect Inheritance	0.24	0.27	-0.02	0.70	0.30	0.30	-0.00	1.00	0.27	0.31	-0.04	0.53
Tend to Live for today (Increasing)	3.21	4.04	-0.83***	0.00	3.56	3.61	-0.05	0.82	3.38	3.88	-0.49**	0.02
Advertising affect your purchase? (Increasing)	3.04	3.87	-0.83***	0.00	3.18	3.94	-0.76***	0.00	3.25	3.77	-0.52**	0.01
Carefully consider purchases (Increasing)	5.21	4.68	0.54**	0.01	5.07	5.04	0.03	0.89	5.07	4.81	0.26	0.13
Keep close watch on Spending (Increasing)	5.70	4.94	0.76***	0.00	5.56	5.27	0.29	0.12	5.54	5.20	0.34**	0.04
Set Long Term Financial Goals (Increasing)	4.67	4.47	0.20	0.37	4.63	4.78	-0.15	0.51	4.73	4.72	0.01	0.96
Have Household Budget (Increasing)	4.66	4.58	0.08	0.75	4.78	4.87	-0.08	0.73	4.73	4.85	-0.12	0.56
How much does opinion of others affect your behaviour? (Increasing)	3.04	3.73	-0.69***	0.00	3.11	3.69	-0.57*	0.01	3.21	3.74	-0.53**	0.01
More satisfying to spend money then save (Increasing)	3.27	4.08	-0.81***	0.00	3.61	3.88	-0.27	0.25	3.50	4.08	-0.57**	0.01

Table 19: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for Experiment 3 (Main Analysis 100% Data)

	Experiment 3: Control (N=335)				Experiment 3: Treatment 1 (N=332)				Experiment 3: Treatment 2 (N=332)			
	No-cashback Mean (N=238)	Cashback Mean (N=97)	Difference	P-value	No-cashback Mean (N=253)	Cashback Mean (N=80)	Difference	P-value	No-cashback Mean (N=240)	Cashback Mean (N=92)	Difference	P-value
1=Male, 0=Female	0.48	0.47	0.00	0.94	0.49	0.59	-0.09	0.15	0.47	0.52	-0.05	0.45
Exact Age	44.63	40.10	4.53**	0.01	45.28	45.63	-0.34	0.86	45.76	37.82	7.95***	0.00
Social Class: A to F	3.70	3.93	-0.23	0.18	3.87	3.79	0.08	0.69	3.73	3.76	-0.04	0.84
1=Urban 0=Rural	0.74	0.74	0.00	0.98	0.64	0.81	-0.17***	0.00	0.67	0.73	-0.06	0.28
Marital Status	2.40	2.22	0.18	0.34	2.36	2.19	0.17	0.42	2.33	2.79	-0.47**	0.02
Children below 18 Years	0.87	0.97	-0.10	0.49	0.82	0.76	0.06	0.68	0.75	1.12	-0.38**	0.01
Employment Status	3.37	3.01	0.36	0.24	3.36	3.05	0.31	0.33	3.43	2.99	0.44	0.15
Highest level of Education	4.45	4.41	0.04	0.84	4.38	4.41	-0.03	0.88	4.53	4.33	0.20	0.28
Household Income	4.17	4.05	0.12	0.77	4.19	4.21	-0.03	0.95	4.24	3.43	0.80*	0.06
Proportion of Income Saved	3.28	3.70	-0.42*	0.07	3.27	3.31	-0.04	0.87	3.35	3.45	-0.10	0.70
Cash Constrained (Decreasing)	3.21	3.03	0.18	0.29	3.12	3.23	-0.11	0.58	3.36	3.09	0.27	0.13
Foresee large Expenses	0.37	0.33	0.04	0.45	0.35	0.39	-0.04	0.52	0.41	0.45	-0.03	0.59
Total Number of Loans	0.61	0.59	0.02	0.85	0.57	0.81	-0.25**	0.02	0.54	0.64	-0.10	0.23
Has Credit Card?	0.62	0.70	-0.08	0.17	0.66	0.69	-0.03	0.65	0.64	0.73	-0.09	0.14
Present Bias	0.27	0.38	-0.11**	0.04	0.24	0.23	0.01	0.82	0.17	0.36	-0.19***	0.00
Impatience (Decreasing)	3.32	3.37	-0.06	0.68	3.34	3.19	0.15	0.31	3.42	3.33	0.09	0.48
Fin. Riskiness (Increasing)	2.40	2.77	-0.37***	0.00	2.41	2.63	-0.21	0.15	2.38	2.83	-0.45***	0.00
Debt-Use	0.13	0.35	-0.22***	0.00	0.11	0.25	-0.14***	0.00	0.13	0.34	-0.21***	0.00
Confidence (Increasing)	1.45	1.61	-0.15	0.39	1.58	1.71	-0.13	0.53	1.64	1.71	-0.07	0.70
Fin. Literacy (Increasing)	0.45	0.29	0.168**	0.00	0.38	0.33	0.04	0.39	0.46	0.20	0.26***	0.00
Attentiveness (Increasing)	0.84	0.30	0.55***	0.00	0.77	0.35	0.42***	0.00	0.65	0.38	0.27**	0.01
Expect Inheritance	0.32	0.41	-0.09	0.13	0.26	0.30	-0.04	0.52	0.23	0.35	-0.12**	0.03
Tend to Live for today (Increasing)	3.46	4.08	-0.62***	0.00	3.36	3.79	-0.42*	0.07	3.35	4.04	-0.69***	0.00
Advertising affect your purchase? (Increasing)	3.13	3.94	-0.81***	0.00	3.05	3.29	-0.24	0.27	3.10	3.77	-0.67***	0.00
Carefully consider purchases (Increasing)	5.07	4.98	0.09	0.60	5.05	4.81	0.23	0.21	5.20	4.91	0.29	0.12
Keep close watch on Spending (Increasing)	5.66	5.42	0.23	0.19	5.58	5.26	0.31	0.10	5.74	5.25	0.49***	0.00
Set Long Term Financial Goals (Increasing)	4.81	4.99	-0.18	0.35	4.63	4.56	0.07	0.75	4.75	4.72	0.04	0.85
Have Household Budget (Increasing)	4.81	4.96	-0.15	0.47	4.84	4.80	0.04	0.86	4.85	4.64	0.21	0.33
How much does opinion of others affect your behaviour? (Increasing)	2.95	3.88	-0.93***	0.00	2.90	3.27	-0.38*	0.07	3.12	3.37	-0.25	0.18
More satisfying to spend money then save (Increasing)	3.61	4.28	-0.67***	0.00	3.52	3.67	-0.15	0.49	3.53	4.03	-0.50*	0.02

Table 20: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for experiments 1, 2, and 3 for subsample of Mortgage Market

	Experiment 1,2,3: Control (N=647)				Experiment 1,2,3: Treatment 1 (N=651)				Experiment 1,2,3: Treatment 2 (N=669)			
	No-cashback Mean (N=465)	Cashback Mean (N=182)	Difference	P-value	No-cashback Mean (N=510)	Cashback Mean (N=141)	Difference	P-value	No-cashback Mean (N=479)	Cashback Mean (N=190)	Difference	P-value
1=Male, 0=Female	0.46	0.49	-0.03	0.54	0.48	0.49	-0.01	0.79	0.55	0.48	0.06	0.14
Exact Age	41.06	36.21	4.85***	0.00	40.21	40.20	0.02	0.99	41.50	36.28	5.22***	0.00
Social Class: A to F	3.58	3.68	-0.10	0.45	3.65	3.67	-0.03	0.84	3.54	3.51	0.03	0.78
1=Urban 0=Rural	0.75	0.75	-0.00	0.91	0.73	0.82	-0.09*	0.03	0.71	0.77	-0.06*	0.09
Marital Status	2.44	2.22	0.22	0.12	2.42	2.37	0.05	0.73	2.39	2.53	-0.15	0.29
Children below 18 Years	0.89	1.23	-0.34***	0.00	1.04	1.02	0.02	0.85	0.85	1.27	-0.42***	0.00
Employment Status	3.04	2.57	0.47*	0.02	2.82	2.55	0.27	0.21	2.91	2.41	0.50*	0.01
Highest level of Education	4.71	4.52	0.19	0.17	4.71	4.59	0.12	0.43	4.68	4.72	-0.04	0.75
Household Income	2.88	2.87	0.02	0.92	2.95	2.83	0.12	0.51	2.75	2.85	-0.10	0.46
Proportion of Income Saved	2.94	3.08	-0.14	0.29	2.96	2.94	0.01	0.92	2.98	3.05	-0.07	0.58
Cash Constrained (Decreasing)	2.94	2.65	0.29*	0.01	2.89	2.77	0.13	0.30	3.11	2.76	0.35***	0.00
Foresee large Expenses	0.42	0.47	-0.05	0.29	0.41	0.52	-0.11*	0.02	0.44	0.45	-0.01	0.80
Total Number of Loans	0.66	0.82	-0.17*	0.03	0.65	0.79	-0.14*	0.08	0.62	0.79	-0.17*	0.01
Has Credit Card?	0.62	0.74	-0.12***	0.00	0.63	0.74	-0.11*	0.01	0.65	0.75	-0.10*	0.01
Present Bias	0.27	0.33	-0.06	0.12	0.23	0.23	-0.01	0.87	0.20	0.33	-0.13***	0.00
Impatience (Decreasing)	3.30	3.35	-0.05	0.61	3.42	3.23	0.18*	0.08	3.39	3.42	-0.03	0.75
Fin. Riskiness (Increasing)	2.50	2.95	-0.45***	0.00	2.58	2.83	-0.25*	0.02	2.45	3.05	-0.60***	0.00
Debt-Use	0.12	0.37	-0.25***	0.00	0.14	0.35	-0.21***	0.00	0.12	0.36	-0.24***	0.00
Confidence (Increasing)	1.49	1.53	-0.03	0.78	1.47	1.56	-0.09	0.51	1.73	1.55	0.18	0.15
Fin. Literacy (Increasing)	0.49	0.34	0.15***	0.00	0.44	0.33	0.11***	0.00	0.50	0.33	0.17***	0.00
Attentiveness (Increasing)	0.73	0.34	0.40***	0.00	0.77	0.33	0.45***	0.00	0.69	0.44	0.24***	0.00
Expect Inheritance	0.33	0.41	-0.08*	0.07	3.29	3.82	-0.52***	0.00	0.30	0.40	-0.10*	0.02
Tend to Live for today (Increasing)	3.28	4.15	-0.87***	0.00	0.30	0.35	-0.05	0.34	3.37	3.89	-0.52***	0.00
Advertising affect your purchase? (Increasing)	3.23	4.04	-0.81***	0.00	3.40	3.94	-0.54***	0.00	3.30	3.97	-0.66***	0.00
Carefully consider purchases (Increasing)	5.17	4.86	0.31*	0.02	5.15	4.80	0.34*	0.01	5.20	4.88	0.32*	0.01
Keep close watch on Spending (Increasing)	5.58	5.29	0.30*	0.02	5.56	5.11	0.46***	0.00	5.61	5.25	0.35***	0.00
Set Long Term Financial Goals (Increasing)	4.78	4.86	-0.09	0.54	4.83	4.59	0.24	0.11	4.88	4.93	-0.05	0.67
Have Household Budget (Increasing)	4.67	4.96	-0.29*	0.05	4.88	4.72	0.16	0.32	4.80	4.88	-0.08	0.56
How much does opinion of others affect your behaviour? (Increasing)	3.22	3.97	-0.76***	0.00	3.20	3.74	-0.54***	0.00	3.24	3.75	-0.52***	0.00
More satisfying to spend money then save (Increasing)	3.41	4.10	-0.70***	0.00	3.53	3.99	-0.46***	0.00	3.50	4.02	-0.52***	0.00

Table 21: Difference of Means t-test between cashback and no-cashback mortgage choice for Control, Treatment 1 and Treatment 2 for experiments 1, 2, and 3 for subsample of Prospective Buyers

	Experiment 1,2,3: Control (N=454)				Experiment 1,2,3: Treatment 1 (N=463)				Experiment 1,2,3: Treatment 2 (N=478)			
	No-cashback Mean (N=313)	Cashback Mean (N=141)	Difference	P-value	No-cashback Mean (N=350)	Cashback Mean (N=113)	Difference	P-value	No-cashback Mean (N=321)	Cashback Mean (N=157)	Difference	P-value
1=Male, 0=Female	0.46	0.48	-0.02	0.66	0.48	0.50	-0.01	0.81	0.52	0.48	0.04	0.42
Exact Age	36.81	32.97	3.84***	0.00	36.53	37.86	-1.33	0.35	38.03	34.52	3.51*	0.01
Social Class: A to F	3.56	3.59	-0.03	0.86	3.63	3.61	0.02	0.88	3.53	3.42	0.11	0.41
1=Urban 0=Rural	0.79	0.79	-0.01	0.84	0.78	0.84	-0.06	0.18	0.75	0.79	-0.04	0.35
Marital Status	2.78	2.26	0.52***	0.00	2.70	2.47	0.23	0.20	2.69	2.62	0.06	0.71
Children below 18 Years	0.86	1.29	-0.43***	0.00	0.93	1.02	-0.09	0.49	0.86	1.26	-0.39***	0.00
Employment Status	2.78	2.34	0.44*	0.04	2.63	2.30	0.33	0.14	2.82	2.31	0.51*	0.02
Highest level of Education	4.81	4.61	0.20	0.23	4.79	4.66	0.12	0.47	4.77	4.80	-0.03	0.85
Household Income	2.84	2.96	-0.12	0.53	2.91	2.97	-0.06	0.75	2.64	2.86	-0.22	0.16
Proportion of Income Saved	3.21	3.20	0.00	0.99	3.14	3.09	0.06	0.71	3.15	3.12	0.03	0.86
Cash Constrained (Decreasing)	2.93	2.64	0.29*	0.02	2.89	2.78	0.12	0.38	3.11	2.69	0.42***	0.00
Foresee large Expenses	0.46	0.50	-0.04	0.39	0.44	0.55	-0.11*	0.05	0.49	0.49	-0.00	0.98
Total Number of Loans	0.57	0.82	-0.26***	0.00	0.53	0.79	-0.26***	0.00	0.48	0.80	-0.32***	0.00
Has Credit Card?	0.58	0.77	-0.19***	0.00	0.65	0.76	-0.11*	0.03	0.60	0.77	-0.17***	0.00
Present Bias	0.30	0.34	-0.04	0.36	0.23	0.23	-0.00	0.97	0.21	0.34	-0.14***	0.00
Impatience (Decreasing)	3.28	3.40	-0.12	0.30	3.37	3.23	0.14	0.22	3.40	3.45	-0.05	0.64
Fin. Riskiness (Increasing)	2.65	3.11	-0.46***	0.00	2.72	2.96	-0.24*	0.05	2.59	3.10	-0.51***	0.00
Debt-Use	0.12	0.44	-0.32***	0.00	0.16	0.41	-0.25***	0.00	0.12	0.38	-0.25***	0.00
Confidence (Increasing)	1.50	1.66	-0.16	0.25	1.53	1.65	-0.11	0.49	1.78	1.55	0.23	0.10
Fin. Literacy (Increasing)	0.46	0.32	0.14***	0.00	0.42	0.32	0.10*	0.01	0.46	0.31	0.16***	0.00
Attentiveness (Increasing)	0.72	0.32	0.40***	0.00	0.71	0.35	0.35***	0.00	0.67	0.39	0.28***	0.00
Expect Inheritance	0.36	0.44	-0.08	0.14	0.32	0.39	-0.07	0.18	0.34	0.44	-0.10*	0.05
Tend to Live for today (Increasing)	3.34	4.27	-0.93***	0.00	3.43	4.01	-0.58***	0.00	3.36	3.97	-0.62***	0.00
Advertising affect your purchase? (Increasing)	3.31	4.28	-0.96***	0.00	3.46	4.03	-0.57***	0.00	3.46	4.13	-0.67***	0.00
Carefully consider purchases (Increasing)	5.10	4.84	0.25	0.10	5.08	4.84	0.24	0.11	5.21	4.95	0.27*	0.04
Keep close watch on Spending (Increasing)	5.51	5.11	0.40*	0.01	5.43	5.07	0.36*	0.02	5.56	5.20	0.36***	0.00
Set Long Term Financial Goals (Increasing)	4.88	4.92	-0.05	0.77	4.91	4.68	0.23	0.17	4.95	4.99	-0.04	0.79
Have Household Budget (Increasing)	4.71	4.94	-0.23	0.16	4.77	4.70	0.07	0.70	4.82	4.96	-0.15	0.34
How much does opinion of others affect your behaviour? (Increasing)	3.33	4.13	-0.81***	0.00	3.37	3.88	-0.52***	0.00	3.42	3.82	-0.40*	0.01
More satisfying to spend money then save (Increasing)	3.55	4.24	-0.69***	0.00	3.53	4.05	-0.52***	0.00	3.47	4.04	-0.57***	0.00

Table 22: Difference of Means t-test between Present-bias and non Present-bias respondents

	No-Present Bias	Present Bias	Difference	(P-value)
Highest level of Education	4.50	4.31	0.19***	0.00
Household Income (Increasing)	2.74	2.54	0.21***	0.00
Cash Constrained Intensity (Decreasing)	2.98	2.73	0.25***	0.00
Foresee large expense in coming Years	0.37	0.41	-0.04*	0.08
Importance of Cash-back (Increasing)	1.71	1.82	-0.12***	0.00
Tend to Live for today without thinking of tomorrow (Increasing)	3.39	3.75	-0.36***	0.00

C Full Specification Results for Main Analysis (100% Sample)

Table 23: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C) (Main Analysis)

Variables	(1) Cash Back E1.C&E3.C	(2) Cash Back E1.C&E3.C	(3) Cash Back E1.C&E3.C	(4) Cash Back E1.C&E3.C	(5) Cash Back E1.C&E3.C	(6) Cash Back E1.C&E3.C
Present Bias	0.099***	0.084***			0.083***	0.082***
	(0.020)	(0.016)			(0.015)	(0.029)
Confidence	-0.004	0.003	-0.007	0.002	0.001	0.003
	(0.008)	(0.011)	(0.008)	(0.010)	(0.009)	(0.010)
Lottery	0.074***	-0.008			-0.020	-0.025*
	(0.016)	(0.011)			(0.018)	(0.014)
Impatience			-0.013	0.006	0.007	0.013
			(0.023)	(0.011)	(0.012)	(0.016)
Financial Risk (Self-perceived)			0.059**	0.028	0.028	0.001
			(0.027)	(0.021)	(0.022)	(0.021)
Debt Use		0.182***		0.183***	0.175***	0.213***
		(0.053)		(0.057)	(0.055)	(0.065)
Fin. Lit. Index		-0.053		-0.064	-0.054	-0.004
		(0.051)		(0.046)	(0.048)	(0.050)
Attentive		-0.089***		-0.088***	-0.087***	-0.076***
		(0.025)		(0.022)	(0.022)	(0.026)
Gender		0.057***		0.044*	0.046**	0.039**
		(0.018)		(0.025)	(0.022)	(0.016)
Age		-0.007**		-0.006***	-0.006***	-0.008***
		(0.003)		(0.002)	(0.002)	(0.002)
Urban		0.008		0.009	0.010	0.036
		(0.025)		(0.022)	(0.021)	(0.034)
Education		-0.015*		-0.018**	-0.018***	-0.019**
		(0.008)		(0.008)	(0.007)	(0.009)
Credit Card (1=Yes)		0.093***		0.082***	0.089***	0.083***
		(0.024)		(0.019)	(0.023)	(0.023)
Saving Proportion						0.010
						(0.015)
Cash Constrained						-0.000
						(0.032)
Income						-0.013*
						(0.008)
Observations	656	653	656	653	653	508
Demography Controls	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 24: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C Separately) (Main Analysis)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**
Present Bias	0.088***	0.088***			0.096***	0.138***	0.121***	0.114***			0.113**	0.173***
	(0.024)	(0.029)			(0.031)	(0.038)	(0.047)	(0.044)			(0.045)	(0.038)
Confidence	-0.021*	-0.022	-0.021**	-0.021	-0.024	-0.027**	0.008	0.028*	0.001	0.026	0.026*	0.026
	(0.011)	(0.017)	(0.009)	(0.016)	(0.017)	(0.013)	(0.017)	(0.016)	(0.015)	(0.017)	(0.015)	(0.028)
Lottery	0.112**	0.038			0.018	-0.122***	0.011	-0.032			-0.037	-0.035
	(0.053)	(0.037)			(0.033)	(0.028)	(0.041)	(0.065)			(0.069)	(0.076)
Impatience			-0.020	0.009	0.008	0.012			-0.006	0.006	0.006	0.023
			(0.022)	(0.010)	(0.008)	(0.017)			(0.030)	(0.018)	(0.017)	(0.024)
Financial Risk (Self-perceived)			0.069***	0.044*	0.046**	0.053**			0.058	0.017	0.016	-0.044***
			(0.024)	(0.023)	(0.018)	(0.027)			(0.043)	(0.031)	(0.033)	(0.015)
Debt Use		0.192***		0.195***	0.184***	0.230**		0.205***		0.215***	0.202***	0.242***
		(0.069)		(0.068)	(0.066)	(0.098)		(0.059)		(0.078)	(0.067)	(0.088)
Fin. Lit. Index		-0.023		-0.038	-0.034	0.001		-0.068***		-0.082**	-0.066**	-0.059
		(0.094)		(0.077)	(0.085)	(0.093)		(0.026)		(0.032)	(0.029)	(0.060)
Attentive		-0.058		-0.053	-0.050	-0.022		-0.131***		-0.131***	-0.130***	-0.124***
		(0.050)		(0.041)	(0.041)	(0.036)		(0.010)		(0.015)	(0.012)	(0.025)
Gender		0.123***		0.104**	0.108**	0.132***		-0.013		-0.023	-0.021	-0.076***
		(0.042)		(0.048)	(0.047)	(0.050)		(0.030)		(0.026)	(0.022)	(0.029)
Age		-0.010***		-0.008***	-0.009***	-0.011***		-0.005		-0.004	-0.004	-0.006
		(0.001)		(0.002)	(0.002)	(0.003)		(0.005)		(0.004)	(0.005)	(0.005)
Urban		0.057**		0.062**	0.059**	0.111***		-0.048		-0.051*	-0.043*	-0.029
		(0.026)		(0.026)	(0.024)	(0.028)		(0.037)		(0.028)	(0.025)	(0.044)
Education		-0.022*		-0.033***	-0.031***	-0.049**		-0.010		-0.007	-0.011**	-0.009
		(0.013)		(0.008)	(0.009)	(0.020)		(0.007)		(0.007)	(0.005)	(0.013)
Credit Card (1=Yes)		0.100**		0.092***	0.091**	0.108**		0.056**		0.035	0.054**	0.027
		(0.042)		(0.033)	(0.035)	(0.044)		(0.026)		(0.022)	(0.026)	(0.075)
Saving Prop						-0.001						0.033
						(0.017)						(0.030)
Cash Constrained						-0.040***						-0.017
						(0.008)						(0.048)
Income						0.022**						-0.040***
						(0.010)						(0.012)
Observations	328	325	328	325	325	257	314	297	314	297	297	206
Demography Controls	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 25: Hypothesis 2, Limited Attention Bias for Control Group in Experiment 2 (E2.C) (Main Analysis)

Variables	(1) Cashback E2.C	(2) Cashback E2.C	(3) Cashback E2.C	(4) Cashback E2.C	(5) Cashback E2.C	(6) Cashback E2.C	(7) Cashback E2.C	(8) Cashback E2.C
Attentive	-0.097***	-0.064***	-0.078***				-0.078***	-0.069**
	(0.035)	(0.024)	(0.026)				(0.026)	(0.034)
Fin. Lit. Index		-0.196***	-0.239***		-0.217***	-0.256***	-0.224***	-0.178**
		(0.063)	(0.064)		(0.077)	(0.074)	(0.069)	(0.073)
Present Bias		-0.001	-0.005				0.008	0.097*
		(0.046)	(0.056)				(0.048)	(0.058)
Confidence		0.022	0.029***		0.009	0.020***	0.024***	0.039***
		(0.019)	(0.010)		(0.013)	(0.007)	(0.007)	(0.010)
Lottery		0.153**	0.085				0.045	0.109
		(0.074)	(0.072)				(0.070)	(0.082)
Careful In Purchase				-0.044***	-0.027***	-0.021***	-0.015***	-0.019
				(0.014)	(0.010)	(0.006)	(0.006)	(0.019)
Impatience					-0.010	0.015	0.016	0.056
					(0.019)	(0.015)	(0.014)	(0.040)
Financial Risk (Self-perceived)					0.065***	0.064***	0.062***	0.053***
					(0.015)	(0.008)	(0.016)	(0.018)
Debt Use		0.278***	0.229***		0.232***	0.187***	0.183***	0.229***
		(0.038)	(0.045)		(0.045)	(0.047)	(0.043)	(0.010)
Gender			0.062***			0.006	0.024	-0.003
			(0.024)			(0.033)	(0.031)	(0.054)
Age			-0.001			-0.003***	-0.002***	-0.002
			(0.002)			(0.001)	(0.001)	(0.001)
Urban			0.038			0.035	0.040	0.022
			(0.043)			(0.028)	(0.030)	(0.059)
Education			-0.015			-0.022	-0.021*	-0.057***
			(0.010)			(0.015)	(0.013)	(0.009)
Credit Card (1=Yes)			0.133**			0.111*	0.110*	0.102
			(0.061)			(0.061)	(0.059)	(0.079)
Saving Proportion								0.045**
								(0.019)
Cash Constrained								-0.057***
								(0.018)
Income								-0.021
								(0.034)
Observations	296	296	293	296	296	293	293	200
Demography Controls	No	No	Yes	No	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 26: Hypothesis 3, 2 versus 1 Framing Effect for Control Group in Experiment 1 and 3 (E1.C and E3.C) (Main Analysis)

Variables	(1) Cash Back E1.C&E3.C	(2) Cash Back E1.C&E3.C	(3) Cash Back E1.C&E3.C	(4) Cash Back E1.C&E3.C	(5) Cash Back E1.C&E3.C	(6) Cash Back E1.C&E3.C	(7) Cash Back E1.C&E3.C
2v1	0.067***	0.052*	0.051**	0.051*	0.053**	0.049*	0.047*
	(0.024)	(0.027)	(0.025)	(0.028)	(0.024)	(0.025)	(0.027)
Present Bias		0.062***	0.081***			0.081***	0.079***
		(0.015)	(0.014)			(0.014)	(0.028)
Confidence		0.011	0.003	0.009	0.003	0.002	0.005
		(0.010)	(0.012)	(0.008)	(0.010)	(0.010)	(0.011)
Lottery1		0.044***	-0.002			-0.015	-0.022
		(0.011)	(0.012)			(0.019)	(0.015)
Impatience				0.001	0.006	0.007	0.012
				(0.016)	(0.011)	(0.012)	(0.016)
Financial Risk (Self Perceived)				0.037	0.028	0.028	0.001
				(0.024)	(0.022)	(0.023)	(0.022)
Debt Use		0.201***	0.181***	0.193***	0.182***	0.174***	0.210***
		(0.061)	(0.051)	(0.065)	(0.055)	(0.053)	(0.065)
Fin Lit Index		-0.061	-0.050	-0.068	-0.061	-0.051	-0.004
		(0.048)	(0.053)	(0.044)	(0.048)	(0.050)	(0.050)
Attentive		-0.079***	-0.088***	-0.080***	-0.087***	-0.086***	-0.076***
		(0.024)	(0.025)	(0.019)	(0.022)	(0.022)	(0.026)
Gender			0.055***		0.042**	0.044**	0.039**
			(0.015)		(0.021)	(0.020)	(0.018)
Age			-0.006**		-0.006***	-0.006***	-0.007***
			(0.003)		(0.002)	(0.002)	(0.002)
Urban			0.006		0.007	0.008	0.034
			(0.026)		(0.023)	(0.022)	(0.037)
Education			-0.016**		-0.019**	-0.019***	-0.018*
			(0.008)		(0.008)	(0.007)	(0.010)
Credit Card (1=Yes)			0.094***		0.083***	0.089***	0.083***
			(0.023)		(0.017)	(0.021)	(0.022)
Saving Proportion							0.009
							(0.015)
Cash Constrained							-0.001
							(0.031)
Income							-0.014*
							(0.008)
Observations	656	656	653	656	653	653	508
Demography Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 27: Hypothesis 4, Treatment effect of Advanced Prototype disclosure (Treatment 1) pooled three experiments (Main Analysis)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 1	-0.041***	-0.040***	-0.042***	-0.040***	-0.060***
	(0.009)	(0.007)	(0.007)	(0.007)	(0.005)
Present Bias		0.030*		0.030*	0.017
		(0.017)		(0.017)	(0.031)
Confidence		0.010*	0.009**	0.009**	0.010***
		(0.005)	(0.004)	(0.004)	(0.002)
Lottery1		0.011		0.003	0.000
		(0.022)		(0.025)	(0.021)
Impatience			0.001	0.003*	0.007
			(0.001)	(0.001)	(0.008)
Financial Risk			0.023***	0.023***	0.011
			(0.008)	(0.008)	(0.009)
Debt Use		0.144***	0.138***	0.136***	0.159***
		(0.030)	(0.030)	(0.031)	(0.031)
Fin Lit Index		-0.123***	-0.124***	-0.122***	-0.102***
		(0.023)	(0.022)	(0.023)	(0.016)
Attentive		-0.069***	-0.068***	-0.068***	-0.055***
		(0.016)	(0.015)	(0.015)	(0.016)
Gender	0.007	0.025	0.018	0.018	0.019
	(0.023)	(0.027)	(0.027)	(0.027)	(0.018)
Age	-0.003***	-0.001	-0.001	-0.001	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Urban	0.038*	0.030*	0.029*	0.030*	0.043**
	(0.020)	(0.018)	(0.017)	(0.018)	(0.019)
Education	-0.019***	-0.013**	-0.015***	-0.015**	-0.020***
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)
Large Expense	0.012	0.016	0.013	0.012	0.008
	(0.034)	(0.033)	(0.031)	(0.031)	(0.032)
Credit Card (1=Yes)	0.092**	0.073**	0.068**	0.068**	0.066**
	(0.037)	(0.031)	(0.030)	(0.031)	(0.033)
Saving Proportion					0.019**
					(0.008)
Cash Constrained					-0.010
					(0.008)
Income					-0.012
					(0.010)
Observations	1,991	1,991	1,991	1,991	1,570
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 28: Hypothesis 5, Treatment effect of Marketing Nudge (Treatment 2) pooled three experiments (Main Analysis)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 2	0.016	0.017	0.012	0.016	0.018
	(0.018)	(0.015)	(0.015)	(0.015)	(0.018)
Present Bias		0.062***		0.064***	0.068**
		(0.010)		(0.012)	(0.029)
Confidence		-0.007*	-0.008**	-0.008**	-0.003
		(0.004)	(0.004)	(0.004)	(0.006)
Lottery1		0.012		-0.007	-0.015
		(0.018)		(0.015)	(0.021)
Impatience			0.003	0.005	0.015***
			(0.006)	(0.007)	(0.006)
Financial Risk			0.047***	0.047***	0.041***
			(0.015)	(0.015)	(0.015)
Debt Use		0.165***	0.154***	0.148***	0.154***
		(0.020)	(0.017)	(0.018)	(0.019)
Fin. Lit. Index		-0.123***	-0.125***	-0.120***	-0.117***
		(0.012)	(0.010)	(0.010)	(0.022)
Attentive		-0.046***	-0.042***	-0.043***	-0.035***
		(0.008)	(0.008)	(0.007)	(0.012)
Gender	0.000	0.019	0.002	0.002	-0.021
	(0.027)	(0.034)	(0.036)	(0.036)	(0.027)
Age	-0.006***	-0.004**	-0.003**	-0.003**	-0.003**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Urban	0.007	0.009	0.008	0.009	0.034
	(0.020)	(0.020)	(0.019)	(0.019)	(0.025)
Education	-0.016***	-0.009***	-0.013***	-0.012***	-0.015**
	(0.003)	(0.003)	(0.002)	(0.002)	(0.007)
Large Expense	-0.029	-0.031*	-0.036**	-0.039**	-0.036***
	(0.021)	(0.018)	(0.017)	(0.016)	(0.011)
Credit Card (1=Yes)	0.083***	0.066***	0.056***	0.058***	0.058**
	(0.030)	(0.021)	(0.019)	(0.021)	(0.024)
Saving Proportion					0.006
					(0.011)
Cash Constrained					-0.027***
					(0.002)
Income					0.005
					(0.010)
Observations	1,991	1,991	1,991	1,991	1,570
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

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Table 29: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C) (Mortgage Market)

Variables	**(1)** **Cash Back** **E1.C&E3.C**	**(2)** **Cash Back** **E1.C&E3.C**	**(3)** **Cash Back** **E1.C&E3.C**	**(4)** **Cash Back** **E1.C&E3.C**	**(5)** **Cash Back** **E1.C&E3.C**	**(6)** **Cash Back** **E1.C&E3.C**
Present Bias	0.068*	0.056**			0.054**	0.083*
	(0.037)	(0.023)			(0.026)	(0.046)
Confidence	0.006	0.007	0.002	0.005	0.003	0.003
	(0.015)	(0.019)	(0.013)	(0.019)	(0.019)	(0.012)
Lottery	0.072***	-0.022			-0.031	-0.031
	(0.016)	(0.043)			(0.042)	(0.035)
Impatience			0.006	0.017	0.019	0.033**
			(0.034)	(0.017)	(0.018)	(0.014)
Financial Risk (Self-perceived)			0.062*	0.023	0.020	-0.015
			(0.034)	(0.017)	(0.017)	(0.028)
Debt Use		0.212***		0.210**	0.211**	0.268**
		(0.077)		(0.085)	(0.085)	(0.107)
Fin. Lit. Index		-0.037		-0.043	-0.042	0.012
		(0.055)		(0.048)	(0.051)	(0.071)
Attentive		-0.091***		-0.088***	-0.088***	-0.075
		(0.034)		(0.033)	(0.033)	(0.046)
Gender		0.101***		0.087***	0.091***	0.084***
		(0.005)		(0.011)	(0.009)	(0.030)
Age		-0.007***		-0.006***	-0.007***	-0.010***
		(0.002)		(0.002)	(0.002)	(0.004)
Urban		0.034		0.029	0.040	0.097
		(0.062)		(0.059)	(0.060)	(0.091)
Education		-0.028**		-0.031**	-0.031**	-0.026*
		(0.014)		(0.013)	(0.013)	(0.015)
Credit Card (1=Yes)		0.049		0.035	0.045	0.017
		(0.034)		(0.033)	(0.034)	(0.036)
Saving Proportion						0.004
						(0.027)
Cash Constrained						0.009
						(0.026)
Income						-0.009
						(0.009)
Observations	415	410	415	410	410	320
Demography Controls	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 30: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C Separately) (Mortgage Market)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**
Present Bias	0.100*	0.175***			0.178***	0.165**	0.101	0.049			0.002	0.267***
	(0.060)	(0.059)			(0.056)	(0.070)	(0.107)	(0.082)			(0.085)	(0.078)
Confidence	-0.009	0.009	-0.008	0.020	0.006	0.011	0.023	0.067***	0.009	0.064***	0.060***	0.045***
	(0.015)	(0.016)	(0.013)	(0.014)	(0.013)	(0.013)	(0.021)	(0.018)	(0.020)	(0.016)	(0.019)	(0.014)
Lottery	0.086*	-0.038			-0.039	-0.085	0.025	-0.068			-0.149	-0.180***
	(0.046)	(0.040)			(0.052)	(0.078)	(0.071)	(0.078)			(0.097)	(0.054)
Impatience			-0.010	-0.012	-0.004	-0.015			0.015	0.049**	0.053**	0.095***
			(0.034)	(0.032)	(0.033)	(0.046)			(0.055)	(0.022)	(0.022)	(0.030)
Financial Risk (Self-perceived)			0.061**	0.025	0.029	0.046***			0.083*	0.008	0.014	-0.002
			(0.025)	(0.032)	(0.031)	(0.016)			(0.045)	(0.041)	(0.041)	(0.055)
Debt Use		0.344***		0.333***	0.333***	0.380***		0.197**		0.261**	0.270**	0.360**
		(0.088)		(0.070)	(0.088)	(0.069)		(0.089)		(0.117)	(0.117)	(0.141)
Fin. Lit. Index		0.077		0.076	0.077	0.115		-0.091		-0.100	-0.119	-0.053
		(0.126)		(0.129)	(0.122)	(0.119)		(0.081)		(0.078)	(0.108)	(0.048)
Attentive		-0.089***		-0.088***	-0.088***	-0.063***		-0.186***		-0.184***	-0.199***	-0.133**
		(0.016)		(0.018)	(0.020)	(0.019)		(0.047)		(0.052)	(0.049)	(0.066)
Gender		0.305***		0.246***	0.292***	0.274***		-0.079		-0.119***	-0.130***	-0.183***
		(0.077)		(0.070)	(0.085)	(0.043)		(0.071)		(0.038)	(0.040)	(0.070)
Age		-0.016***		-0.013**	-0.014**	-0.015***		-0.001		-0.002	-0.002	-0.005
		(0.006)		(0.006)	(0.006)	(0.006)		(0.007)		(0.005)	(0.005)	(0.009)
Urban		0.061		0.086	0.057	0.053		-0.075		-0.048	-0.038	0.091
		(0.157)		(0.099)	(0.152)	(0.112)		(0.105)		(0.073)	(0.089)	(0.081)
Education		-0.047		-0.058*	-0.049*	-0.056		-0.010		-0.021	-0.025***	0.001
		(0.030)		(0.031)	(0.029)	(0.038)		(0.013)		(0.014)	(0.009)	(0.024)
Credit Card (1=Yes)		0.070		0.062	0.061	0.100		-0.046		-0.123*	-0.137*	-0.076
		(0.074)		(0.061)	(0.064)	(0.064)		(0.082)		(0.074)	(0.071)	(0.076)
Saving Prop						0.033						0.033
						(0.042)						(0.030)
Cash Constrained						-0.013						0.035
						(0.022)						(0.052)
Income						0.019						0.011
						(0.032)						(0.016)
Observations	202	173	202	173	173	127	190	177	190	177	177	129
Demography Controls	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 31: Hypothesis 2, Limited Attention Bias for Control Group in Experiment 2 (E2.C) (Mortgage Market)

Variables	(1) Cashback E2.C	(2) Cashback E2.C	(3) Cashback E2.C	(4) Cashback E2.C	(5) Cashback E2.C	(6) Cashback E2.C	(7) Cashback E2.C	(8) Cashback E2.C
Attentive	-0.115***	-0.067***	-0.067**				-0.058***	-0.194***
	(0.036)	(0.022)	(0.030)				(0.019)	(0.067)
Fin. Lit. Index		-0.246***	-0.352***		-0.242***	-0.299***	-0.297***	-0.307**
		(0.062)	(0.070)		(0.088)	(0.105)	(0.085)	(0.127)
Present Bias		-0.009	-0.016				-0.037	0.147
		(0.065)	(0.088)				(0.079)	(0.129)
Confidence		-0.000	0.029		-0.012	0.005	0.013	0.063**
		(0.023)	(0.020)		(0.029)	(0.016)	(0.022)	(0.012)
Lottery		0.165**	0.091				0.024	0.283***
		(0.084)	(0.060)				(0.061)	(0.059)
Careful In Purchase				-0.040**	-0.027	-0.011	-0.010	-0.058***
				(0.019)	(0.020)	(0.018)	(0.016)	(0.017)
Impatience					0.001	0.031	0.033	0.176**
					(0.034)	(0.024)	(0.024)	(0.081)
Financial Risk (Self-perceived)					0.074**	0.097***	0.103***	0.171***
					(0.030)	(0.030)	(0.038)	(0.050)
Debt Use		0.321***	0.267***		0.270***	0.209***	0.211***	0.064
		(0.068)	(0.027)		(0.069)	(0.043)	(0.045)	(0.116)
Gender			-0.037			-0.117***	-0.108***	-0.132**
			(0.036)			(0.031)	(0.032)	(0.063)
Age			-0.001			-0.002	-0.001	-0.000
			(0.001)			(0.001)	(0.001)	(0.004)
Urban			-0.046			0.041	0.046**	0.176**
			(0.034)			(0.042)	(0.023)	(0.075)
Education			-0.017***			-0.029***	-0.033***	-0.077***
			(0.006)			(0.005)	(0.007)	(0.012)
Credit Card (1=Yes)			0.213***			0.140**	0.128**	0.081
			(0.051)			(0.071)	(0.063)	(0.089)
Saving Proportion								0.073***
								(0.025)
Cash Constrained								-0.074**
								(0.034)
Income								0.005
								(0.053)
Observations	180	180	169	180	180	169	169	120
Demography Controls	No	No	Yes	No	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 32: Hypothesis 3, 2 versus 1 Framing Effect for Control Group in Experiment 1 and 3 (E1.C and E3.C) (Mortgage Market)

Variables	(1) Cash Back E1.C&E3.C	(2) Cash Back E1.C&E3.C	(3) Cash Back E1.C&E3.C	(4) Cash Back E1.C&E3.C	(5) Cash Back E1.C&E3.C	(6) Cash Back E1.C&E3.C	(7) Cash Back E1.C&E3.C
2v1	0.079**	0.061**	0.056**	0.052	0.053**	0.051*	0.048*
	(0.032)	(0.031)	(0.024)	(0.033)	(0.023)	(0.026)	(0.029)
Present Bias		0.031	0.055***			0.053**	0.088*
		(0.042)	(0.021)			(0.024)	(0.046)
Confidence		0.019	0.008	0.015	0.006	0.005	0.006
		(0.018)	(0.019)	(0.016)	(0.019)	(0.019)	(0.015)
Lottery1		0.038**	-0.014			-0.024	-0.025
		(0.018)	(0.044)			(0.044)	(0.043)
Impatience				0.019	0.016	0.017	0.029*
				(0.023)	(0.018)	(0.018)	(0.016)
Financial Risk (Self Perceived)				0.033	0.018	0.018	-0.013
				(0.030)	(0.018)	(0.018)	(0.032)
Debt Use		0.226***	0.209***	0.223**	0.211***	0.209**	0.263**
		(0.087)	(0.075)	(0.098)	(0.081)	(0.083)	(0.114)
Fin Lit Index		-0.040	-0.039	-0.045	-0.048	-0.044	0.001
		(0.071)	(0.056)	(0.060)	(0.048)	(0.052)	(0.064)
Attentive		-0.085**	-0.089***	-0.084**	-0.086**	-0.086***	-0.070
		(0.036)	(0.034)	(0.033)	(0.034)	(0.033)	(0.046)
Gender			0.096***		0.080***	0.087***	0.081**
			(0.008)		(0.009)	(0.011)	(0.034)
Age			-0.007***		-0.006***	-0.007***	-0.008
			(0.003)		(0.002)	(0.002)	(0.014)
Urban			0.038		0.042	0.043	0.090
			(0.061)		(0.057)	(0.059)	(0.089)
Education			-0.029**		-0.031**	-0.032**	-0.024
			(0.014)		(0.013)	(0.013)	(0.017)
Credit Card (1=Yes)			0.046		0.036	0.043	0.027
			(0.033)		(0.031)	(0.033)	(0.026)
Saving Proportion							0.008
							(0.026)
Cash Constrained							0.012
							(0.027)
Income							-0.016
							(0.011)
Observations	415	415	410	415	410	410	320
Demography Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 33: Hypothesis 4, Treatment effect of Advanced Prototype disclosure (Treatment 1) pooled three experiments (Mortgage Market)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 1	-0.068***	-0.070***	-0.071***	-0.070***	-0.083***
	(0.010)	(0.017)	(0.014)	(0.017)	(0.016)
Present Bias		0.006		0.008	0.014
		(0.033)		(0.034)	(0.042)
Confidence		0.008	0.007	0.007	0.006
		(0.009)	(0.009)	(0.009)	(0.005)
Lottery1		0.010		0.003	-0.004
		(0.017)		(0.019)	(0.009)
Impatience			0.008	0.008	0.017
			(0.008)	(0.007)	(0.013)
Financial Risk			0.020**	0.020*	0.004
			(0.010)	(0.010)	(0.013)
Debt Use		0.163***	0.156***	0.155***	0.180***
		(0.031)	(0.035)	(0.035)	(0.042)
Fin Lit Index		-0.088***	-0.086***	-0.086***	-0.057***
		(0.015)	(0.018)	(0.016)	(0.017)
Attentive		-0.080***	-0.080***	-0.080***	-0.070***
		(0.015)	(0.014)	(0.014)	(0.015)
Gender	0.000	0.014	0.007	0.008	0.008
	(0.024)	(0.026)	(0.025)	(0.025)	(0.018)
Age	-0.004**	-0.002	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Urban	0.003	0.002	0.004	0.004	0.033
	(0.024)	(0.021)	(0.021)	(0.021)	(0.037)
Education	-0.025**	-0.018**	-0.020**	-0.020**	-0.024***
	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)
Large Expense	0.040	0.032	0.031	0.031	0.018
	(0.034)	(0.033)	(0.031)	(0.031)	(0.030)
Credit Card (1=Yes)	0.100**	0.069*	0.064*	0.064*	0.041
	(0.043)	(0.038)	(0.037)	(0.038)	(0.037)
Saving Proportion					0.010
					(0.013)
Cash Constrained					-0.005
					(0.004)
Income					-0.008
					(0.009)
Observations	1,292	1,292	1,292	1,292	1,024
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 34: Hypothesis 5, Treatment effect of Marketing Nudge (Treatment 2) pooled three experiments (Mortgage Market)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 2	0.004	0.005	0.003	0.006	0.005
	(0.014)	(0.010)	(0.010)	(0.011)	(0.013)
Present Bias		0.051***		0.051***	0.068***
		(0.014)		(0.014)	(0.025)
Confidence		-0.009	-0.012	-0.011	-0.008
		(0.006)	(0.008)	(0.008)	(0.006)
Lottery1		0.021		0.005	-0.003
		(0.034)		(0.029)	(0.028)
Impatience			0.007	0.009	0.023***
			(0.010)	(0.010)	(0.009)
Financial Risk			0.051***	0.050***	0.041***
			(0.013)	(0.014)	(0.013)
Debt Use		0.185***	0.174***	0.167***	0.157***
		(0.023)	(0.025)	(0.026)	(0.029)
Fin. Lit. Index		-0.121***	-0.117***	-0.113***	-0.090***
		(0.024)	(0.023)	(0.024)	(0.033)
Attentive		-0.035**	-0.032***	-0.032***	-0.033*
		(0.014)	(0.012)	(0.012)	(0.018)
Gender	-0.003	0.008	-0.012	-0.011	-0.026
	(0.018)	(0.024)	(0.025)	(0.024)	(0.026)
Age	-0.007***	-0.004**	-0.004***	-0.004**	-0.004**
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Urban	-0.013	-0.011	-0.007	-0.007	0.033
	(0.036)	(0.034)	(0.032)	(0.032)	(0.036)
Education	-0.016***	-0.010*	-0.013***	-0.012***	-0.017*
	(0.005)	(0.005)	(0.004)	(0.004)	(0.009)
Large Expense	-0.012	-0.013	-0.020	-0.022*	-0.020***
	(0.017)	(0.015)	(0.013)	(0.013)	(0.006)
Credit Card (1=Yes)	0.113***	0.079***	0.065***	0.068***	0.058***
	(0.034)	(0.023)	(0.022)	(0.023)	(0.021)
Saving Proportion					0.005
					(0.012)
Cash Constrained					-0.027***
					(0.004)
Income					0.007
					(0.009)
Observations	1,315	1,315	1,315	1,315	1,022
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

E Full Specification Results for Prospective Buyers

Table 35: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C) (Prospective Buyers)

Variables	(1) Cash Back E1.C&E3.C	(2) Cash Back E1.C&E3.C	(3) Cash Back E1.C&E3.C	(4) Cash Back E1.C&E3.C	(5) Cash Back E1.C&E3.C	(6) Cash Back E1.C&E3.C
Present Bias	0.065	0.127***			0.125***	0.188***
	(0.055)	(0.034)			(0.036)	(0.050)
Confidence	0.024	0.013	0.019	0.013	0.013	0.013
	(0.021)	(0.029)	(0.015)	(0.032)	(0.028)	(0.030)
Lottery	0.066*	-0.033			-0.043	-0.043
	(0.040)	(0.080)			(0.083)	(0.076)
Impatience			0.018	0.022	0.023	0.019**
			(0.049)	(0.025)	(0.022)	(0.010)
Financial Risk (Self-perceived)			0.080**	0.014	0.011	-0.016
			(0.038)	(0.019)	(0.020)	(0.028)
Debt Use		0.276***		0.286***	0.283***	0.355***
		(0.052)		(0.061)	(0.064)	(0.120)
Fin. Lit. Index		0.084		0.056	0.071	0.082
		(0.087)		(0.080)	(0.079)	(0.063)
Attentive		-0.078***		-0.079**	-0.075***	-0.094**
		(0.025)		(0.031)	(0.026)	(0.044)
Gender		0.003		-0.018	-0.008	-0.022
		(0.057)		(0.044)	(0.050)	(0.083)
Age		-0.012***		-0.011***	-0.011***	-0.014***
		(0.004)		(0.003)	(0.003)	(0.003)
Urban		-0.019		-0.034	-0.018	0.146
		(0.127)		(0.123)	(0.127)	(0.175)
Education		-0.035**		-0.036***	-0.037***	-0.007
		(0.015)		(0.012)	(0.013)	(0.014)
Credit Card (1=Yes)		0.137***		0.125***	0.131***	0.127**
		(0.030)		(0.024)	(0.030)	(0.063)
Saving Proportion						-0.026**
						(0.011)
Cash Constrained						0.029
						(0.057)
Income						-0.014
						(0.012)
Observations	352	321	352	321	321	250
Demography Controls	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 36: Hypothesis 1 for Control groups pooled in Experiment 1 and 3 (E1.C and E3.C Separately) (Prospective Buyers)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E1.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**	**Cash Back E3.C**
Present Bias	0.154**	0.218***			0.224***	0.270***	0.052	-0.043			0.042	-0.042
	(0.067)	(0.047)			(0.062)	(0.039)	(0.138)	(0.116)			(0.060)	(0.061)
Confidence	-0.015	-0.013	-0.014	-0.005	-0.006	-0.050	0.071	0.137**	0.051	0.157***	0.087***	0.140***
	(0.030)	(0.024)	(0.027)	(0.029)	(0.030)	(0.030)	(0.043)	(0.064)	(0.034)	(0.040)	(0.023)	(0.051)
Lottery	0.075	0.026			0.084	0.108	0.040	-0.498***			-0.109	-0.204**
	(0.060)	(0.050)			(0.089)	(0.110)	(0.073)	(0.160)			(0.168)	(0.101)
Impatience			0.008	-0.018	-0.002	-0.003			0.030	0.079	0.034	0.114***
			(0.049)	(0.037)	(0.032)	(0.024)			(0.064)	(0.067)	(0.052)	(0.029)
Financial Risk (Self-perceived)			0.073*	0.056*	0.070	0.023			0.127***	-0.005	0.075*	0.086**
			(0.038)	(0.034)	(0.046)	(0.017)			(0.037)	(0.078)	(0.043)	(0.040)
Debt Use		0.494***		0.533***	0.469***	0.511***		0.334***		0.283***	0.155***	0.256***
		(0.080)		(0.063)	(0.070)	(0.126)		(0.091)		(0.071)	(0.060)	(0.098)
Fin. Lit. Index		0.223***		0.227***	0.275***	0.248***		-0.274		-0.175*	0.003	-0.078
		(0.069)		(0.080)	(0.098)	(0.065)		(0.210)		(0.099)	(0.087)	(0.087)
Attentive		-0.108***		-0.131***	-0.108***	-0.099**		-0.272**		-0.211**	-0.144***	-0.126***
		(0.034)		(0.038)	(0.034)	(0.039)		(0.127)		(0.099)	(0.055)	(0.030)
Gender		0.232***		0.167*	0.178*	0.277***		-0.367**		-0.358***	-0.171***	-0.361***
		(0.081)		(0.085)	(0.102)	(0.066)		(0.182)		(0.081)	(0.040)	(0.077)
Age		-0.007***		-0.004*	-0.006**	-0.015***		-0.004		-0.003	-0.001	0.001
		(0.003)		(0.002)	(0.003)	(0.001)		(0.011)		(0.010)	(0.008)	(0.011)
Urban		0.070		0.125	0.080	0.167		-0.207		-0.139	-0.015	0.201
		(0.140)		(0.118)	(0.134)	(0.147)		(0.195)		(0.097)	(0.101)	(0.235)
Education		-0.061*		-0.084**	-0.064**	-0.077***		0.003		-0.032	-0.011	-0.038
		(0.035)		(0.034)	(0.031)	(0.021)		(0.017)		(0.031)	(0.018)	(0.030)
Credit Card (1=Yes)		0.176		0.170	0.154	0.181***		-0.144***		0.019	0.020	0.020
		(0.145)		(0.112)	(0.129)	(0.057)		(0.023)		(0.089)	(0.095)	(0.146)
Saving Prop						-0.056						-0.083***
						(0.037)						(0.017)
Cash Constrained						0.018						0.118
						(0.025)						(0.078)
Income						-0.038						0.034
						(0.025)						(0.023)
Observations	124	95	124	95	95	79	128	91	128	91	118	89
Demography Controls	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 37: Hypothesis 2, Limited Attention Bias for Control Group in Experiment 2 (E2.C) (Prospective Buyers)

Variables	(1) Cashback E2.C	(2) Cashback E2.C	(3) Cashback E2.C	(4) Cashback E2.C	(5) Cashback E2.C	(6) Cashback E2.C	(7) Cashback E2.C	(8) Cashback E2.C
Attentive	-0.109***	-0.077***	-0.039				-0.034	-0.071***
	(0.035)	(0.016)	(0.042)				(0.045)	(0.023)
Fin. Lit. Index		-0.239***	-0.335***		-0.219***	-0.231	-0.309**	-0.243*
		(0.058)	(0.081)		(0.082)	(0.000)	(0.123)	(0.126)
Present Bias		-0.046	-0.077				-0.138*	0.102
		(0.081)	(0.084)				(0.072)	(0.084)
Confidence		0.016	0.038***		0.010	0.030	0.037***	0.051***
		(0.016)	(0.012)		(0.027)	(0.000)	(0.007)	(0.015)
Lottery		0.236***	0.199***				0.234***	0.279**
		(0.069)	(0.063)				(0.064)	(0.117)
Careful In Purchase				-0.018	-0.011	0.031	0.065***	0.019
				(0.020)	(0.028)	(0.000)	(0.019)	(0.043)
Impatience					-0.004	-0.041	-0.067**	-0.041
					(0.030)	(0.000)	(0.031)	(0.045)
Financial Risk (Self-perceived)					0.065**	0.044	0.034	0.017
					(0.032)	(0.000)	(0.022)	(0.047)
Debt Use		0.337***	0.292***		0.317***	0.299	0.425***	0.306**
		(0.043)	(0.050)		(0.042)	(0.000)	(0.091)	(0.124)
Gender			-0.155*			-0.156	-0.209**	-0.109
			(0.093)			(0.000)	(0.103)	(0.166)
Age			0.004***			0.002	0.002	-0.002
			(0.001)			(0.000)	(0.001)	(0.006)
Urban			-0.035			-0.079	-0.011	-0.063
			(0.165)			(0.000)	(0.154)	(0.176)
Education			-0.040**			-0.026	-0.050**	-0.038
			(0.016)			(0.000)	(0.020)	(0.028)
Credit Card (1=Yes)			0.198***			0.230	0.139**	0.245***
			(0.051)			(0.000)	(0.055)	(0.091)
Saving Proportion								-0.003
								(0.014)
Cash Constrained								0.006
								(0.029)
Income								0.001
								(0.035)
Observations	132	132	131	132	132	131	131	96
Demography Controls	No	No	Yes	No	No	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 38: Hypothesis 3, 2 versus 1 Framing Effect for Control Group in Experiment 1 and 3 (E1.C and E3.C) (Prospective Buyers)

Variables	(1) Cash Back E1.C&E3.C	(2) Cash Back E1.C&E3.C	(3) Cash Back E1.C&E3.C	(4) Cash Back E1.C&E3.C	(5) Cash Back E1.C&E3.C	(6) Cash Back E1.C&E3.C	(7) Cash Back E1.C&E3.C
2v1	0.103***	0.070***	0.015	0.057***	0.023	0.009	-0.020
	(0.025)	(0.017)	(0.033)	(0.022)	(0.032)	(0.038)	(0.035)
Present Bias		0.030	0.125***			0.124***	0.191***
		(0.056)	(0.035)			(0.037)	(0.053)
Confidence		0.034	0.014	0.029	0.013	0.013	0.012
		(0.028)	(0.029)	(0.024)	(0.032)	(0.028)	(0.030)
Lottery1		0.037	-0.031			-0.042	-0.045
		(0.054)	(0.082)			(0.087)	(0.074)
Impatience				0.037	0.021	0.023	0.020*
				(0.033)	(0.026)	(0.023)	(0.011)
Financial Risk (Self Perceived)				0.040	0.014	0.011	-0.016
				(0.027)	(0.020)	(0.020)	(0.027)
Debt Use		0.294***	0.275***	0.296***	0.284***	0.283***	0.357***
		(0.055)	(0.053)	(0.073)	(0.061)	(0.067)	(0.121)
Fin Lit Index		0.008	0.083	-0.012	0.055	0.071	0.082
		(0.097)	(0.087)	(0.079)	(0.080)	(0.079)	(0.062)
Attentive		-0.080**	-0.077***	-0.074***	-0.077***	-0.075***	-0.095**
		(0.032)	(0.024)	(0.028)	(0.029)	(0.024)	(0.045)
Gender			0.003		-0.018	-0.008	-0.022
			(0.057)		(0.044)	(0.049)	(0.083)
Age			-0.012***		-0.010***	-0.011***	-0.014***
			(0.004)		(0.004)	(0.004)	(0.003)
Urban			-0.016		-0.028	-0.016	0.144
			(0.120)		(0.118)	(0.119)	(0.173)
Education			-0.035**		-0.036***	-0.037***	-0.006
			(0.015)		(0.012)	(0.013)	(0.013)
Credit Card (1=Yes)			0.135***		0.122***	0.130***	0.130**
			(0.031)		(0.025)	(0.031)	(0.060)
Saving Proportion							-0.027***
							(0.010)
Cash Constrained							0.029
							(0.057)
Income							-0.015
							(0.011)
Observations	268	268	236	268	236	236	183
Demography Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 39: Hypothesis 4, Treatment effect of Advanced Prototype disclosure (Treatment 1) pooled three experiments (Prospective Buyers)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 1	-0.063***	-0.064***	-0.066***	-0.064***	-0.101***
	(0.011)	(0.014)	(0.012)	(0.013)	(0.029)
Present Bias		0.013		0.016	0.016
		(0.046)		(0.046)	(0.055)
Confidence		0.021	0.021	0.021	0.018
		(0.013)	(0.013)	(0.013)	(0.011)
Lottery1		-0.010		-0.015	-0.018
		(0.030)		(0.031)	(0.023)
Impatience			0.009	0.010	0.010
			(0.011)	(0.011)	(0.013)
Financial Risk			0.014	0.014	-0.002
			(0.011)	(0.010)	(0.011)
Debt Use		0.193***	0.188***	0.187***	0.216***
		(0.029)	(0.033)	(0.033)	(0.040)
Fin Lit Index		-0.062**	-0.063*	-0.060**	-0.038
		(0.029)	(0.036)	(0.030)	(0.039)
Attentive		-0.077***	-0.076***	-0.076***	-0.065***
		(0.017)	(0.017)	(0.017)	(0.020)
Gender	-0.026*	-0.027	-0.033	-0.033	-0.032
	(0.015)	(0.023)	(0.024)	(0.024)	(0.024)
Age	-0.004**	-0.002	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Urban	-0.007	-0.000	0.001	0.002	0.011
	(0.026)	(0.023)	(0.024)	(0.023)	(0.022)
Education	-0.035***	-0.027***	-0.027***	-0.027***	-0.036***
	(0.009)	(0.005)	(0.004)	(0.004)	(0.008)
Large Expense	0.045**	0.028	0.029	0.029	0.018
	(0.021)	(0.019)	(0.018)	(0.019)	(0.028)
Credit Card (1=Yes)	0.141***	0.093**	0.090**	0.092**	0.078
	(0.053)	(0.044)	(0.045)	(0.046)	(0.051)
Saving Proportion					-0.005
					(0.013)
Cash Constrained					-0.002
					(0.009)
Income					0.002
					(0.012)
Observations	892	892	892	892	701
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1

Table 40: Hypothesis 5, Treatment effect of Marketing Nudge (Treatment 2) pooled three experiments (Prospective Buyers)

Variables	(1) CashbackExp1, 2, 3	(2) CashbackExp1, 2, 3	(3) CashbackExp1, 2, 3	(4) CashbackExp1, 2, 3	(5) CashbackExp1, 2, 3
Treatment 2	0.027***	0.031***	0.029***	0.031***	0.036***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.012)
Present Bias		0.054***		0.058***	0.058**
		(0.009)		(0.008)	(0.025)
Confidence		-0.009	-0.011	-0.010	-0.008
		(0.009)	(0.010)	(0.010)	(0.007)
Lottery1		0.025		0.011	0.016
		(0.037)		(0.036)	(0.029)
Impatience			0.008	0.009	0.013*
			(0.008)	(0.008)	(0.008)
Financial Risk			0.046***	0.046***	0.030***
			(0.012)	(0.013)	(0.010)
Debt Use		0.203***	0.195***	0.187***	0.188***
		(0.006)	(0.010)	(0.008)	(0.013)
Fin. Lit. Index		-0.111**	-0.108***	-0.102**	-0.086**
		(0.044)	(0.040)	(0.042)	(0.038)
Attentive		-0.034	-0.031	-0.031	-0.038
		(0.022)	(0.021)	(0.022)	(0.030)
Gender	-0.028	-0.018	-0.038*	-0.037*	-0.054**
	(0.018)	(0.022)	(0.023)	(0.021)	(0.024)
Age	-0.007***	-0.005**	-0.004***	-0.004**	-0.005***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Urban	-0.054	-0.040	-0.033	-0.033	-0.000
	(0.038)	(0.034)	(0.033)	(0.032)	(0.048)
Education	-0.021***	-0.014*	-0.015***	-0.014**	-0.021**
	(0.008)	(0.008)	(0.006)	(0.006)	(0.009)
Large Expense	-0.025***	-0.024***	-0.027***	-0.029***	-0.026**
	(0.007)	(0.007)	(0.005)	(0.006)	(0.011)
Credit Card (1=Yes)	0.185***	0.132***	0.121***	0.123***	0.114***
	(0.029)	(0.017)	(0.011)	(0.013)	(0.028)
Saving Proportion					-0.010
					(0.007)
Cash Constrained					-0.026***
					(0.008)
Income					0.012
					(0.011)
Observations	920	920	920	920	714
Demography Controls	Yes	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes	Yes

Source: Author calculation using experiment data on Stata14.
Notes: Standard Errors clustered at regional (5 in total) level, shown in brackets.
*** p<0.01, ** p<0.05, * p<0.1