HETEROGENEOUS RESPONSES TO INTEREST RATE PRICE DISCLOSURES

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Abstract

Using a quasi-field experiment, I explicitly isolate the channel of credit interest rate price disclosure comprehension to examine what impacts it has on purchasing and borrowing decisions. I find that consumers overwhelmingly cannot determine credit cost obligations from interest rate price disclosures despite evidence of effort and no restrictions on use of outside aids. The lack of ability to determine costs leads some to avoid credit and delay purchases of goods, even when it is optimal to use credit, and others to utilize credit and purchase goods, even when it is optimal not to do so.

Keywords: Price Disclosures, Interest Rates, Financial Literacy, Credit Cards
JEL: G51, G53, G21, G41

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1 Introduction

Interest rates are the standard measures we use to communicate price of credit. For many credit instruments, like auto loans and payday loans, interests rates are disclosed alongside analogous pricing information in dollar terms. But for other credit instruments, including the most popularly held credit instruments in the United States, credit cards, interest rates are the only form of pricing information available to consumers at the time they make purchasing and borrowing decisions. For these instruments, there is an underlying assumption that consumers can translate interest rate price disclosures, along with other available credit terms, into future credit cost obligations. In this paper, I test the veracity of this assumption and I explicitly isolate the channel of interest rate price disclosure comprehension, something that has not been previously attempted in research, to examine what impacts it has on purchasing and borrowing decisions.

2 Implementation

To conduct this analysis, I use a multi-month quasi-field experiment. Participants are recruited from an online labor market and complete the experiment remotely. In order to better simulate their natural information environment, participants are not restricted from using outside tools, spreadsheets or help from others. To create liquidity constraints and hence a need for credit, participants are provided a monthly cash income stream that can be used to make purchases from a menu of attractively priced goods and that is intentionally insufficient for making any immediate purchases (see Figure 1). Participants forgo income stream payments for

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1 For example, these loans disclose the finance charge, which is the summed amount of interest charge over the life of the loan.
2 Participants were recruited through Amazon Mechanical Turk (MTurk) and were limited to those who live in the United States, speak English, were over the age of 18, and have at least a 90% MTurk task completion rate. Precautions were made to prevent participants from taking the experiment multiple times from the same IP address. Participants were told that they would receive $2 for completion of the study (which would take 15–20 minutes) and had a 1 in 30 chance of receiving up to $77.50 worth of bonus payments and Amazon gift cards. Financial awards were deposited directly into participant MTurk accounts. Gift card redemption codes were transmitted through an MTurk email messaging tool. Participants completed the experiment through their own Internet connection. Several studies have found that MTurk workers are more diverse than student pools but tend to be younger, more educated and have lower income than the general population (Berinsky, Huber and Lenz, 2012; Paolacci, Chandler and Ipeirotis, 2010).
3 Goods were Amazon Gift Cards that were priced at approximately 80% of their purchasing value (see Figure 1). Since interactions with participants were anonymous, no information on mailing addresses
2 to 10 months, depending on the price of the chosen good, until enough income is "saved" to receive a good. Income stream payments resume after receipt of goods. Participants who choose not to make any purchases receive all monthly income stream payments as scheduled.4

Some participants are also offered a credit option that allows them to obtain goods immediately and requires repayment over time from the income stream. Once credit plans are repaid, which can take between 2 to 13 months depending on price of chosen good and price of credit plan, participants resume receipt of any remaining monthly income stream payments. Credit plans vary between participants by price and price-disclosure method (see Figure 2). Credit plan prices can either be 0, 18 or 42% APR (annual percentage rate). Several credit plans disclose terms similarly to credit cards by providing minimum monthly payment information and prices in interest rate form. Interest rates here can be quoted in monthly terms or both monthly and annual terms.5 Other credit plans replace interest rate price disclosures with dollar finance charges (i.e., the summed up dollar amount of interest charges accrued over the life of the loan if only the minimum monthly payment is paid every month). This latter version of credit plans has historical significance. It was a popular price disclosure method that retailers, the main creditors for consumer goods during most of the 20th century, employed in their store lines of credit (i.e., customer credit accounts) decades before interest rate price disclosures supplanted them in popularity and at least 50 years before the major rise of bank credit cards.6 In the experiment, credit plans with dollar finance charge terms closely resemble their historical counterparts as offered by major retailers such as Sears and Montgomery Ward in appearance (see examples of these historic plans in Appendix Figure 1).

Participants are tasked with deciding whether to make a purchase, and if so, whether to use credit to receive goods immediately or to first save enough money before receiving goods.7
1,477 participants were recruited for this experiment. Each participant had a 1 in 30 chance to receive an income stream and have her experiment decision realized.\footnote{When a participant completed all questions in the study, she was prompted to select a number between 1 and 30, inclusively. Then a random number generator would do the same. If the numbers matched, then the participant’s purchasing decision would occur.}

To explicitly isolate the channel of interest rate price disclosure comprehension, I include several experiment design elements. First, to directly identify differences in credit cost comprehension between price disclosure methods, participants are asked to calculate the number of months it would take to pay off a specified credit purchase using a credit plan with a participant's assigned disclosure method (see Appendix Figure 2).\footnote{This calculation question is similar to the one asked in (Soll, Keeney, and Larrick, 2013). In this paper I, in addition, ask the question over varying price disclosure methods, incentivize correct responses, and capture time spent on question to document effort.} This question is asked after the purchasing and borrowing decision is made to avoid any manipulation of the regular decision process of participants. To motivate effort, participants are offered a chance of financial reward if they answer the calculation question correctly. Responses to this calculation question not only can identify participant ability to determine credit costs but can also inform on the relationship between ability and borrowing and purchasing decisions.

Second, to distinguish between inability to translate credit price disclosures into cost obligations and neglect to do so, I proxy participant effort by time spent on the calculation question.\footnote{Time statistics were also collected for other components of the experiment including the directions and the purchasing and borrowing question.}

Third, participants who are familiar with credit cards may more easily recall common payment flexibility features (e.g., the ability to repay credit plans within a grace period, avoiding any interest rate charges) if assigned credit with interest rate disclosures than if assigned credit with dollar finance charge disclosures. This could impact borrowing decisions if consumers have a tendency to be (irrationally) overoptimistic of their speed of repayment of credit cards, underestimating credit interest charges to be accrued (Ausubel, 1991). To abstract from this mechanism, I effectively turn all flexibility features of the credit instruments off by setting monthly income stream payments exactly equal to the minimum monthly credit plan obligations.

\begin{center}
\textit{address specifics of costs of credit, but rather asked questions about the mechanics of different components of the experiment (i.e., income stream, purchasing through savings and purchasing through credit). To avoid participants whose main objective is to complete the study as quickly as possible to earn the participation fee, I drop observations from participants who spent less than 15 seconds examining their credit plan in the tutorial section. Conclusions are not changed if I include these participants.}
\end{center}
In this way, it is impossible for participants to avoid incurring interest charges if they decide to use a credit plan. Turning flexibility features off has an added benefit – it creates the simplest version of a line of credit. A credit card user typically has at her disposal a wide array of choices for how to repay credit through time, creating a complex choice problem. But in this setting, there is only one singular way to repay a credit purchase of a given amount. Hence, I test if interest rate price disclosure comprehension can impact consumption and borrowing even when a line of credit is in its simplest and most deterministic form. Similarly, if experiment participants have difficulty translating interest rates into cost obligations in this setting, then presumably they would have even greater difficulty comprehending cost obligations of lines of credit in more typical settings with full use of payment flexibility features.

Finally, different price disclosure methods necessarily require visually different presentation methods that might themselves drive results. Specifically, while interest rates can concisely summarize price in one number typically located in fine print, dollar finance charges must be listed individually for each amount borrowed. Historically, each finance charge is presented in a table next to its associated loan amount. Hence, dollar finance charge disclosures might be more visible than interest rate disclosures. To abstract from impacts of visual differences between credit disclosure methods, one version of the credit plan with interest rate disclosures bolds, underlines, increases font and changes color of the portion of the fine print that includes the interest rate in order to draw eyes directly to price.

3 Results
3.1 Disclosure Comprehension

Responses from the calculation question reveal that participants are overwhelmingly unable to calculate the required months needed to pay off a credit plan if credit prices are quoted as interest rates. Specifically, it takes 10 months to pay off the credit balance of the purchase in the calculation question.\textsuperscript{11} As seen in the distribution of responses in Figure 3 Panel A, a small minority of participants in interest rate terms arms answer this question correctly. At most, 19% arrive at the correct response in the "Focus On" interest rate terms arm, whose disclosure terms

\textsuperscript{11} The calculation question asks the number of months it takes to pay off a credit balance for a $40 credit purchase at 42% APR (equivalently, a $7.77 dollar finance charge) with minimum monthly payments of $5 a month.
emphasizes credit price within the fine print. In stark contrast, 58% of those who receive credit in dollar finance charge terms answer correctly.

Even more strikingly and in further support that information in fine print being ignored is not the sole driver of these results, Figure 3 Panel B shows that those who receive credit in interest rate terms take the same or significantly more time on the calculation question than those who receive credit in dollar finance charge terms yet arrive at overwhelmingly incorrect responses. This result is significant because it indicates that those that view credit price as an interest rate do not simply ignore or neglect price information. Rather they are unable to translate these disclosures into cost obligations even with effort, incentives, and no limitations on utilizing outside help or tools. Specifically, those offered dollar finance charge terms spend an average of 65 seconds on the calculation question, while interest rate terms arm participants average between 97 and 145 seconds (with those in the "Focus On" interest rate terms arm spending the most time on the question reaping very modest improvements in accuracy). And even those who arrive at the correct response take four times longer on the calculation question if price is disclosed as an interest rate than if it is disclosed as a dollar finance charge.

These results mean that interest rate price disclosures, when unaccompanied by other disclosures, effectively obfuscate credit cost obligations from borrowers. And though interest rate price disclosures facilitate the comparison of prices across credit instruments, they alone are insufficient for enabling consumers to understand what tradeoff they are making in terms of consumption goods when they use credit to make purchases. This occurs even when consumers invest effort in translating interest rates into cost obligations. Said in another way, interest rates are a much more taxing and much less salient method than dollar finance charge terms for relaying the exact same cost information.

These findings have similarities to "future bias" as described in Stango and Zinman (2009). Future bias is defined as "the tendency to underestimate future value from present value, time horizon and a periodic rate of return." The bias is typically used to describe consumers who underestimate future returns on savings instruments due to incorrect accounting of interest compounding. Credit cards provide a similar information setting in which consumers must estimate future costs from a periodic interest rate. However, while future bias would lead borrowers to underestimate credit costs, it should not lead them to estimate that there are no costs to credit. Surprisingly, an implied estimate of zero costs is the most popular response to the
calculation question among those who receive credit in interest rate terms (see the frequency of the response of "8 months" among the response distributions in Figure 3 Panel A). This nonsensical response potentially is an indication of confusion or uncertainty concerning credit costs rather than necessarily a bias in a certain direction since participants spend a non-trivial amount of time on the calculation question to arrive at a no-cost response. Further evidence of participant awareness of positive costs despite implied zero-cost responses to the calculation question can be found in the next section by observing changes in demand of credit as price increases from zero to a positive value.

3.2 Borrowing and Purchasing Decisions

How does this inability to determine credit costs impact borrowing and purchasing decisions? The purchasing and borrowing decision question in the experiment identify that some participants, as a result, avoid credit while others utilize credit even when it is not optimal. Figure 4 Panels A and B summarize the percentage of participants who use any credit and make any purchases, respectively, among those in the dollar finance charge, pooled interest rate, and no-credit arms. Corresponding tables to these figures can be found in Appendix Table 1. The black dashed line in Figure 4 Panel B indicates that approximately 61% of participants purchase a good when no credit is offered to them. At 0% APR, 76% and 78% of dollar finance charge and pooled interest rate arm participants make a purchase, respectively. Correspondingly, at 0% APR, 52% and 49% of dollar finance charge and pooled interest rate arm participants use credit, respectively. None of these outcome differences between disclosure methods are statistically significant even at the 10% level. The fact that people make purchases through savings rather than through credit when credit is priced at 0% APR indicates that there is either some degree of mistrust of credit or there is a preference among some participants to receive purchases at a future date rather than immediately.

As the cost of credit increases from 0% to 18% APR, the percentage of participants who use credit decreases significantly for both types of disclosure methods (see Figure 4 Panel A). This indicates that participants recognize a difference between 0 and positive credit cost even when this information appears only in the fine print, as in the case of interest rate price disclosures. In fact, we see in Figure 5 Panel A that even those in the interest rate arms whose calculation question's responses imply zero or negative credit costs significantly decrease their
demand of credit in response to this price increase, further supporting the idea that these participants are aware that costs exist but lack the ability to determine what they are. At 18% APR, 36% of dollar finance charge arm participants demand credit while only 25% of interest rate arm participants do, levels that are significantly different from each other at the 5% level. This means that interest rate price disclosures cause some participants to underconsume or non-optimally delay consumption because they do not understand credit costs. As for purchases, we see in Figure 4 Panel B that at 18% APR 79% and 75% of dollar finance charge and interest rate arm participants purchase goods, respectively, which are not significantly different from each other even at the 10% level. Because the percent of purchasers do not change significantly with the credit price increase, it means that the drop in credit usage is mostly due to purchasers switching from purchasing through credit to purchasing through savings. We do see, however, in Panel D, that the amount purchased (the intensive margin) for those in the interest rate arm does decrease slightly, but significantly at the 10% level, as interest rates increase from 0% to 18% APR.

As credit costs increase from 18% to 42% APR, the existence of a different type of participant becomes apparent. We see in Figure 4 Panels A and B that while dollar finance charge arm participants significantly reduce their demand for both credit and goods, interest rate arm participants have little to no reaction to the increase in prices. Specifically, the percentages of dollar finance charge arm participants who demand any credit and purchase any goods decrease by 17 and 18 percentage points, respectively, while the percentages of interest rate arm participants who demand any credit and purchase any goods decrease by a statistically insignificant 2.3 and 2.8 percentage points, respectively. Correspondingly on the intensive margin, we see in Figure 4 Panels C and D that the average amounts borrowed or purchased among those in the interest rate arm change very minimally as credit price increases from 18% to 42% APR. Although the percentages of participants who use any credit are not statistically different across disclosure arms at 42% APR, the overall demand of credit is higher among

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12 Interestingly, we see in Appendix Figure 3 Panel A that this underconsumption finding is most muted among the "Focus On" interest rate terms arm. Potentially by highlighting price within the fine print it decreases participant unease or mistrust of the credit instrument by the overturing of not hiding price or by enabling the focus of attention to a more limited set of information. Of course, clearer interest rate price disclosures that motivate greater trust in credit may have negative impacts on consumers if prices increases and consumers remain unable to determine cost obligations.
interest rate arm participants than among dollar finance charge arm participants. Specifically we see in Figure 4 Panel C that at 42% APR, borrowers in interest rate arms borrow $4.08 more than borrowers in the dollar finance charge arm, a difference that is statistically significant at the 10% level. More strikingly, we see in Panel B of Figure 4 that at 42% APR, 61% of those in the dollar finance charge arm make a purchase, which is nearly the same demand as those in the no-credit arm. In contrast, 72% of those in interest rate arms make a purchase at that credit price. This means that interest rate price disclosures cause some participants to purchase goods that they would not otherwise have purchased had credit been in dollar terms. These participants are non-optimally consuming goods at prices above their value for those goods because they are not correctly incorporating the cost of credit into total price. The fact that these participants use credit and purchase goods at too expensive of a price indicates that these participants heuristically decide to consume credit and buy goods when they do not understand costs. Overall, at 42% APR, 18% more participants make purchases with interest rate price disclosures than with dollar finance charge terms. We see in Appendix Figure 3 that including APR or emphasizing costs in the fine print of interest rate credit terms does not significantly impact the general findings.

Hence, the purchasing and borrowing decision question reveals heterogeneous responses to receiving price information in the form of interest rates. Some consumers are vulnerable to non-optimally forgoing the use of credit when prices are sufficiently low and others are vulnerable to non-optimally utilizing credit when prices are too high. The experiment is able identify that inability to translate interest rate price disclosures into credit cost obligations is the isolated channel causing these non-optimal decisions, and that this channel is able to produce these results even in the most simplest setting for a line of credit.

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13 It is possible for the percent of purchasers to differ across price disclosure methods while the percent of borrowers to appear equivalent because interest rate price disclosures lead to both underconsumption and overconsumption of credit. Percent of purchasers can be higher with interest rate price disclosures if those that opt out of credit when offered interest rate terms continue to purchase through savings and if those that opt out of credit when faced with higher prices within the dollar finance charge arm are not interested in purchasing the good through savings.

14 Another possible explanation for this finding other than interest rate credit being less salient than dollar finance charge credit is that participants overweight the dollar finance charge service fee, which they pay off over time, by treating it as if it were the net present value of credit costs. However, the results from the calculation question provide some evidence against this explanation as participants are much more aware of their credit obligations with dollar finance charge disclosures than they are with interest rate disclosures.
As an aside, we see that not only does credit access cause more people to make purchases (Figure 4 Panel B), but it also makes purchasers purchase more compared to purchasers with no credit access (Figure 4 Panel D). This highlights why many retailers have incorporated credit into their sales strategies.

3.3 Additional Suggestive Evidence of Cost Incomprehension and Underconsumption

Though many papers have documented instances of overconsumption in response to non-salient costs, whether it be in the sales tax setting (Chetty, Looney and Kroft, 2009; Feldman and Ruffle, 2015; Goldin and Homonoff, 2013; Taubinsky and Rees-Jones, 2018), the credit setting (Bertrand and Morse (2011), Stango and Zinman, 2009) or various other settings (Finkelstein, 2009; Cabral and Hoxby, 2013; Hossain and Morgan, 2006; Brown, Hossain and Morgan, 2010; Ellison and Ellison, 2009), to the best of my knowledge, this is the first to document underconsumption. The experiment provides more suggestive evidence that inability to comprehend costs can, in some instances, cause underconsumption. Figure 5 presents the percentages of participants who demand any credit and who purchase any goods by credit disclosure method and by whether or not individual calculation question responses imply zero or negative credit costs. Figure 5 Panel B shows that the percentage of participants in interest rate disclosure arms who make a purchase when credit is priced at 0% APR is similar regardless of response to the calculation question. However, we see in Panel A that those that estimate zero or negative costs in the calculation question are less likely to utilize free credit for these purchases than those that estimate positive costs. Specifically, only 59% of purchasers who estimate zero or negative costs in the calculation question utilize available free credit for the purchase compared to 73% of purchasers among those who estimate positive costs. Similarly, but even more strikingly, among those in dollar finance charge arms (Figure 5 Panels C and D), only 40% of purchasers who estimate zero or negative costs in the calculation question utilize available free credit for the purchase compared to 78% of purchasers among those who estimate positive costs.

15 Appendix Figure 4 presents similar figures but separates out observations by correct and incorrect calculation question responses rather than by whether or not calculation question responses imply zero or negative credit costs.
4 Discussion

The findings in this paper are distinct from those in previous research in two ways. First, the experiment identifies the isolated impacts of price incomprehension of interest rates. In contrast, previous research studies either identify different mechanisms, do not disentangle mechanisms or both. For example, in a field experiment, Bertrand and Morse (2011) provide one set of payday loan borrowers the prices, in APR terms, of cheaper credit instruments (e.g., credit cards, sub-prime mortgages) to contrast with the prices of payday loans. To another set they provide the dollar finance charges that borrowers could accumulate if they refinanced payday loans over longer time horizons in addition to the equivalent dollar finance charges that could accumulate on credit cards over the same time horizons. They find that fewer borrowers in the dollar finance charge treatment take out payday loans and that borrowers in both treatment arms reduce the size of payday loans that they take out in the months following the treatment. Because payday loans, by law, must disclose prices both as interest rates as well as dollar finance charges, the mechanisms that drive results in Bertrand and Morse (2011) are not related to cost comprehension. Rather, possible mechanisms include improved evaluation through the presence of comparison anchor prices, the extension of borrower narrow decision frames or the reduction of procrastination by the presence of charge information over longer horizons. Furthermore, because Bertrand and Morse combine multiple treatments into each treatment arm, they are unable to pinpoint the exact mechanisms that drive results. In another example in the sales tax setting, researchers have found that while consumers typically do not adequately incorporate sales taxes into prices if prices are posted exclusive of tax, they do have the ability to do the incorporation and in fact do incorporate the tax if it is framed as a percent discount or tax rebate

\[16\] Only 24% of those in the dollar finance charge arm have a response to the calculation question that implies zero or negative credit costs.
(Feldman and Ruffle, 2015). Hence, unlike in the credit setting studied in this paper, incomprehension does not seem to play as much of a role in the sales tax setting.

This paper does not preclude other factors from driving irrational behaviors in the credit setting. Rather, it identifies, for the first time, that interest rate price disclosures by themselves can have dramatic impacts on borrowing and purchasing decisions through the channel of cost incomprehension, even with the complete neutralization of impacts from other factors and within an extremely simplified line of credit setting. This has important implications. With 44% of U.S. families holding credit card debt, according to the 2016 Survey of Consumer Finances, it is the most widely held type of debt among U.S. households (Bricker et al., 2017). Yet, the results of this paper imply that many of these households do not know how much it costs them to use this type of credit at the point-of-purchase. The results also imply that since most retailers historically used to disclose credit prices with dollar finance charges, then their adoption of interest rate disclosures and the subsequent rise and dominance of bank credit cards corresponds to a historical shift and deterioration in the comprehension of credit costs among consumers. This frames the status of financial literacy in a different light. Whereas research in financial literacy finds a non-trivial percentage of the population failing to evaluate compound interest (see Lusardi and Mitchell, 2011, 2017; Lusardi and Tufano, 2015), the ability to do this evaluation was not as necessary in the credit setting historically until price disclosures shifted to interest rates.  

Identifying the channel of interest rate incomprehension is perhaps most relevant for policy. It implies that effective policy measures would need to increase salience of the cost of credit before consumers make purchasing decisions and with tools other than interest rates. The 2009 Credit Card Accountability Responsibility and Disclosure (CARD) Act mandates the disclosure of total finance charges for credit card holders in the case that only the minimum monthly requirement is paid each month and in the case that a credit balance is paid off in exactly 36 months. Though consumers can more tangibly see how interest charges add up

17 The results of the paper also strengthen the findings in financial literacy literature concerning inability of respondents to evaluate compound interest by financially incentivizing correct responses, measuring effort by capturing time on question and documenting a comparison comprehension ability of dollar finance charge.
depending on how they repay their balances, they only see these CARD disclosures after they make purchasing decisions, limiting an identified dimension of impact found in this paper.\textsuperscript{18}

The second way this paper is distinct from previous research is the finding of heterogeneous responses to non-salient costs. This experiment directly finds evidence of underconsumption in the case of interest rate price disclosures and suggestively in the case of free credit combined with inability to determine credit costs. As previously mentioned, a consumer response of under- or delayed consumption when faced with hard-to-evaluate price disclosures has not been previously documented, to the best of this author's knowledge. These findings are perhaps related in nature to those found on ambiguity aversion (Ellsberg, 1961) in which experiment participants prefer to take bets with known probabilities over bets with unknown probabilities.

Overconsumption responses documented in this experiment also differ from those observed in other settings. Specifically, Taubinsky and Rees-Jones (2018) find that consumers become significantly more attentive to sales taxes (when prices are exclusive of tax) as sales taxes increase. In contrast, I find that participants appear to make no distinction in terms of purchasing nor borrowing between credit priced at 18\% APR and credit priced at 42\% APR when credit price is disclosed as an interest rate (in stark contrast to when it is disclosed as a dollar finance charge).

These heterogeneous responses document agent behaviors that support various theory. Experiment participants that are vulnerable to underconsuming behave like the rational consumers modeled in Milgrom's (1981) persuasion game that assume that if credit cost information is unclear or hidden it must mean that it is expensive. They can also behave similarly to the sophisticated consumers in shrouding models as found in Gabaix and Laibson (2006) and Heidhues, Kőszegi, and Murooka (2017). Experiment participants that are vulnerable to overconsuming behave like the agents that need to exist to support a shrouded-prices equilibrium in Gabaix and Laibson (2006) and Heidhues, Kőszegi, and Murooka (2017).

\textsuperscript{18} Furthermore, credit card customers who pay their bills and view their credit card activity online would need to open an electronic version of their paper statement in order to view the disclosure as it is not required to be displayed elsewhere. Agarwal, Chomsisengphet, Mahoney and Stroebel (2015) and Keys and Wang (2016) find that the 36-month payment disclosures create an anchoring effect. Keys and Wang present evidence that some consumers who were paying their balance in full each month end up paying the 36-month payment.
Finally, the underconsumption finding identifies a population that would carry credit card debt at low enough prices but for the lack of salience of costs. This population might include convenience users who pay off their credit card balances in full each billing cycle or individuals who decide to not have or sparingly use a credit card. There are signs that the credit industry is moving to capture this market of hesitant borrowers, in part, by providing credit pricing information in more salient terms. For example, there now exist several Financial Technology firms that have partnered with online retailers and that offer customers the option to purchase goods on credit and to repay this credit in installments for a known length of time and at a known finance charge and interest rate.\textsuperscript{19} In response, major credit card issuers such as American Express and Chase have started to offer customers the option to use their credit card lines to purchase goods and to repay the purchases in installments for a known length of time and at a price that is quoted as a fee in dollar terms (Carrns, 2019).\textsuperscript{20} A good example of the use of more salient costs to attract demand while simultaneously showing contempt towards less salient costs can be found in American Express's promotional materials for their Pay It Plan It feature that explicitly states, "Split up large purchases over time for a fixed monthly fee and no interest charges."\textsuperscript{21} These more recent innovations potentially signal a partial return to the more salient-cost credit plans offered historically by retailers.\textsuperscript{22}

References


\textsuperscript{19} Examples of these firms include Affirm and Afterpay.

\textsuperscript{20} American Express's option is called the Pay it/Plan it feature and Chase's option is called My Chase Plan.


\textsuperscript{22} Because these price disclosure innovations are for credit cards, they come with universal store acceptance features that historical retail credit, generally, did not offer outside a given region.


Feldman, Naomi E., and Bradley J. Ruffle. 2015. “The Impact of Including, Adding, and


Figure 1
Example of Question Page in Experiment

You will receive $5 a month for 13 months with the first payment starting in one month.

You can use some of the money from your income stream to purchase one of these specially priced Amazon Gift Cards:

You can purchase and receive your desired Amazon Gift Card today by using a credit plan OR you can wait till you have enough money saved up from your income stream to purchase it later.

If you would like to receive the Amazon Gift Card today, you must use the following credit plan:

<table>
<thead>
<tr>
<th>Credit Balance</th>
<th>Payment</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
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<td>$5</td>
<td>$5</td>
<td></td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. If the remaining credit balance is zero, you will only pay the remaining balance from your income stream. The first withdrawal occurs in one month.

Which Amazon Gift Card would you like to purchase if any? Please select one choice below:

Not Interested in purchasing Amazon Gift Card at any time.

How would you like to make the purchase? Please select one choice below:

- SAVING: Receive Amazon Gift Card after saving up enough money to purchase it.
- CREDIT: Use credit plan and receive Amazon Gift Card today.
Figure 2
18% APR Credit Plans

Panel A: Dollar Finance Charge

Panel B: Interest Rate – Base

Panel C: Interest Rate – APR

Panel D: Interest Rate – Focus On
Figure 3
Calculation Question Results

Panel A: Calculation Responses

Note: The correct response to the calculation question is 10 months, which is designated by the red bar. 8 months, designated by the black bar, would indicate a calculation in which there is 0 cost to using credit.

Panel B: Average Time Spent on Question

Note: Bands represent 95% confidence intervals around estimate of mean.
Figure 4
Borrowing and Purchasing Decisions

Panel A: Percent of Participants Who Use Credit

Panel B: Percent of Participants Who Make a Purchase

Panel C: Borrowed Amount per Borrower

Panel D: Purchased Amount per Purchaser

Note: * and ** indicate a statistical difference at the 10% and 5% significance level, respectively, relative to estimate for dollar finance charge terms arm at the same price. Red ◆ and ● markers indicate a statistical difference at the 10% significance level relative to estimate at 18% APR within the same credit disclosure method.
Figure 5
Percent Who Use Credit or Make Any Purchase by Price Disclosure Method and Response to Calculation Question

Panel A: Percent of Participants in Interest Rate Terms Arms Who Use Credit

Panel B: Percent of Participants in Interest Rate Terms Arms Who Make a Purchase

Panel C: Percent of Participants in Dollar Finance Charge Terms Arm Who Use Credit

Panel D: Percent of Participants in Dollar Finance Charge Terms Arm Who Make a Purchase

Note: *, ** and *** indicate a statistical difference at the 10%, 5% and 1% significance level, respectively, relative to estimate for those who received credit at the same price and who answer 8 months or less to the calculation question. Red ♦ and ♠ markers indicate a statistical difference at the 10% significance level relative to estimate at 18% APR within the same calculation question response category.
Appendix Figure 1
Examples of Credit Terms in Mail-Order Catalogs

Panel A: Dollar Finance Charge Terms

Panel B: Interest Rate Terms

Source: Spiegel 1956 Spring/Summer Catalog.

Source: Spiegel 1962 Fall/Winter Catalog.
Appendix Figure 2
Calculation Question (Dollar Finance Charge Credit Version)

Assume that you will be receiving **$5 for 13 months** with your first payment starting in one month.

If you are interested in purchasing the following Amazon Gift Card:

![Amazon Gift Card Image]

and you are **planning to purchase it using the following credit plan**:

<table>
<thead>
<tr>
<th>Step 1: Look up the price of the Gift Card</th>
<th>Step 2: Add the one-time service fee listed below to the PRICE of the Gift Card to calculate your starting Credit Balance</th>
<th>Step 3: Pay the amount listed below Every Month Until your credit balance is 0*</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td>$0.56</td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td>$1.94</td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td>$4.27</td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td>$7.77</td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td>$12.63</td>
<td>$5</td>
</tr>
</tbody>
</table>

* These payments will be automatically withdrawn from your income stream. If the remaining credit balance in any one month is less than the monthly payment, you will only pay the remaining balance from your income stream. The first withdrawal starts in one month.

then how many months will it take you to pay off your credit balance? For example, if your credit balance will be equal to 0 in one month from today, then your answer is "1". Please type your response in the box below:
Appendix Figure 3
Borrowing and Purchasing Decision by Credit Disclosure Arm

Panel A: Percent of Participants Who Use Credit

Panel B: Percent of Participants Who Make a Purchase

Note: +, *, and ** indicate a statistical difference at the 15%, 10%, and 5% significance level, respectively, between estimate and corresponding estimate for same priced installment arm. Yellow markers indicate a statistical difference at the 5% significance level between estimate and corresponding estimate for the arm with the same quoting method priced at 18% APR.
Appendix Figure 4
Percent Who Use Credit or Make Any Purchase by Price Disclosure Method and Response to Calculation Question

Panel A: Percent of Participants offered Interest Rate Terms Who Use Credit
Panel B: Percent of Participants offered Interest Rate Terms Who Make a Purchase
Panel C: Percent of Participants offered Dollar Finance Charge Terms Who Use Credit
Panel D: Percent of Participants offered Dollar Finance Charge Terms Who Make a Purchase

Note: * and ** indicate a statistical difference at the 10% and 5% significance level, respectively, relative to estimate for those who received credit at the same price and who answer the calculation question incorrectly. Red ◆ and ◆ markers indicate a statistical difference at the 10% significance level relative to estimate at 18% APR within the same calculation question response category.
### Appendix Table 1

**Panel A: Percent of Participants Who Use Credit**

<table>
<thead>
<tr>
<th></th>
<th>(1) APR: 0%</th>
<th>(2) APR: 18%</th>
<th>(3) APR: 42%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate (pooled)</td>
<td>-0.03</td>
<td>-0.10</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.52</td>
<td>0.36</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>N</td>
<td>421</td>
<td>429</td>
<td>425</td>
</tr>
</tbody>
</table>

Note: Omitted variable is Dollar Finance Charge arm.

**Panel B: Percent of Participants Who Make a Purchase**

<table>
<thead>
<tr>
<th></th>
<th>(1) APR: 0%</th>
<th>(2) APR: 18%</th>
<th>(3) APR: 42%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar Finance Charge</td>
<td>0.15</td>
<td>0.18</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Interest Rate (pooled)</td>
<td>0.17</td>
<td>0.14</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.61</td>
<td>0.61</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>N</td>
<td>533</td>
<td>541</td>
<td>537</td>
</tr>
</tbody>
</table>

Note: Omitted variable is No Credit arm.