REVOLVING CREDIT: SHROUDED BY CONSTRUCTION*

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Abstract
Creditors may find it optimal to not compete on price if consumers have difficulty translating credit price disclosures into true cost obligations. This paper presents empirical evidence combining newly compiled historical credit price data from mail-order catalogs and an experiment in an online labor market to show that this has indeed occurred with the emergence of revolving credit instruments, such as credit cards, whose primary price disclosure is an interest rate. I find that: 1) even when in plain sight of the consumer, interest rates do not sufficiently communicate cost obligations of revolving credit which leads to non-optimal borrowing and purchasing, 2) the credit instruments that were prevalent historically prior to the emergence of revolving credit are significantly better at communicating costs, and 3) credit issuers quickly adopted the innovation of revolving credit and subsequently followed pricing behavior that when contrasted with prior pricing behavior is consistent with their operating within a 'shrouded equilibrium.' These findings provide empirical support for current theories on shrouding and suggest that effective policies to counter overconsumption and non-competitive pricing would need to increase salience of revolving credit costs prior to the purchasing decision through information other than interest rates.

Keywords: Historical Credit Prices, Shrouded Equilibrium, Consumer Behavior, Revolving Credit, Price Disclosures

JEL: D12, D14, D18, D22, D90, G21, G23, L10, N22

1. Introduction

Interest rates are the standard method used to communicate price of credit to consumers. And for some popular credit instruments, such as credit cards, it is the primary price disclosure available to consumers at the time of purchasing and borrowing decisions that enables the calculation of credit cost obligations. However, if consumers have difficulty translating interest

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rates into actual future cost obligations, which previous literature has alluded to, then only providing this price disclosure can lead consumers to making non-optimal borrowing and purchasing decisions and tempt creditors into engaging in non-competitive pricing behaviors. In this paper, I take advantage of the fact that, historically, interest rates were not always the most prevalent method of disclosing price on consumer credit. By combining a newly compiled data set of historical credit terms from mail-order catalogs with results from an experiment in which participants make borrowing and purchasing decisions, I identify if interest rates "shroud" credit costs from consumers and how this has impacted consumer and creditor behavior.

Theoretical shrouding models such as those presented in Gabaix and Laibson (2006); Heidhues, Kőszegi, and Murooka (2016); and Heidhaues, Kőszegi, and Murooka (2017) – hereafter "GL2006," "HKM2016," and "HKM2017," respectively – require that there exist consumers that are myopic or unaware of a portion of the total price of a good. In these models, firms might not find it optimal to educate consumers and compete on total price because such a revelation may lead consumers to avoid purchasing part or all of the good. I investigate if such a situation arises when consumers are deciding to purchase goods with revolving credit (e.g., credit cards or lines of credit). Given the structure of revolving credit (i.e., the option to borrow a flexible amount of credit with flexible repayment options), the seemingly natural and primary term that conveys its price is the interest rate that would be applied to any potential credit balance. In contrast, other forms of credit typically present information, in addition to interest rates, that can help consumers understand and evaluate the interest charges that they will incur. For example, closed-end loans, such as home mortgages and car finance loans, disclose the number and size of periodic payments to be made as well as the "finance charge"; that is, the sum of interest to be paid over the life of the loan. Previous literature has found empirical evidence that consumers are inattentive to portions of price that are quoted in percentages (Chetty et al., 2009).¹ And research in financial literacy has highlighted difficulties people have with compound interest calculations in the framing of both savings (Lusardi and Mitchell, 2011, 2017) and debt (Lusardi and Tufano, 2015). In light of this, I examine whether consumers correctly incorporate revolving credit interest charges into their calculation of the total price of a good before they make a purchasing decision. If they do not, firms may exploit this inattention in a "shrouded

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¹ Chetty et al. (2009) find that sales taxes are not salient to consumers. In contrast to sales tax, which is calculated and charged at one point in time for a purchase, interest on revolving credit is charged periodically over time and hence would require more effort to incorporate into price.
equilibrium” – an equilibrium in which no firm is willing to educate consumers on the true cost obligation of revolving credit – and not compete on the price of revolving credit.

In the first part of the paper, I use a real-stakes experiment on an online labor market to directly test if consumers incorporate credit costs when they make their purchasing decisions. In the experiment, participants are provided a monthly income stream that can be used to make purchases from a menu of goods. This income stream intentionally forces liquidity constraints on participants, as it is insufficient for making any immediate purchases. Some participants are also offered the option to use a credit plan to acquire goods immediately rather than waiting until enough income has been saved up for a purchase. The credit plans offered vary between participants by price and price-quoting method. Some participants are offered credit plans in revolving terms (i.e., an interest rate in percent), and others receive credit plans quoted in a historically recent, and potentially more salient, quoting method called "installment terms." In the United States, installment (or "time") terms were ubiquitous in the first two-thirds of the twentieth century, and they are still used today in other countries. The price of credit in installment terms is quoted as a one-time fee that a consumer adds to the cash price of a good to create the "time price." For example, an installment plan in the experiment charges a fee of $4.58 for a credit purchase of a good priced at $50; this amounts to a time price of $54.58. The time price is then used as the starting credit balance. Regardless of quoting method, credit plans require the exact same monthly payment stream to pay down the credit balance (i.e., credit plans that only differ in quoting method are otherwise equivalent).2 Experiment participants are asked to make a decision concerning what to purchase (including the option of making no purchase at all). If participants have the option of credit and plan to make purchases, they then choose whether to purchase with credit or with savings. Finally, participants in the credit arms are asked to calculate the number of months it would take to pay off a specified credit purchase.

If credit costs are tangible and fully considered with both quoting methods, then the level of demand for credit and goods will be equivalent between the two quoting methods. Furthermore, demand for credit or goods will decrease as credit costs increase. However, if one quoting method relays credit cost information more tangibly than another, then we should see a divergence of the level of credit and good demand between quoting methods. What the

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2 The previous installment plan example is equivalent to a revolving credit plan priced at 18% APR (or 1.5% a month) if participants are required to pay $5 a month towards their credit balance.
divergence would look like varies from model to model. In some models, rational consumers assume that if credit cost information is hidden or unclear then it must be because it is expensive. Participants of this type will consume weakly less credit/goods when faced with the less salient quoting method than with the more salient one. They will also be, to some degree, more sensitive to credit price increases. In other models, consumers ignore or do not consider credit costs that they do not understand. Participants of this type will consume weakly more credit/goods when faced with the less salient quoting method than with the more salient quoting method. They will also be less sensitive to credit price increases. The existence of such participants is a necessary condition for the existence of a shrouded equilibrium in shrouding models. And the smoking gun for their existence in the experiment would be instances of higher demand under the less salient quoting method than under the more salient quoting method.

The responses to the calculation question in the experiment provide strong evidence that revolving terms are much less salient to participants than installment terms. Specifically, revolving credit arm participants overwhelmingly miscalculate the required months needed to pay off a credit plan, completely the opposite of their installment credit counterparts. In addition to this, revolving credit arm participants take significantly more time to arrive at their responses than their installment credit arm counterparts. In light of this, I find that the use of revolving terms causes participants to incorrectly incorporate credit costs into their purchasing and borrowing decisions. Specifically, when credit costs increase from 0 to a relatively smaller interest charge, demand for credit decreases more among those offered revolving credit than among those offered installment credit. However, when credit cost is further increased to a relatively larger interest charge, I find no further changes in demand among those offered revolving credit but large and significant drops in demand for both credit and goods among those offered installment credit. Most important, at the highest credit price, demand for goods is significantly higher among those offered revolving credit than among those offered installment credit. Specifically, as the price of credit increases from 18% APR to 42% APR, the percentage of installment credit arm participants who make any purchases decreases by 24%. But the corresponding percentage among revolving credit arm participants decreases by only 2.7%. And at 42% APR, 72% of those offered revolving credit make purchases, while only 60% of those offered installment credit do. This last observation confirms that many consumers ignore or underestimate credit costs when these costs are quoted in revolving terms.
Altogether these results indicate that simply disclosing an interest rate at the time of a purchasing decision is not enough to communicate the true cost obligation of credit to consumers. As a result, consumers can make nonoptimal borrowing and purchasing decisions. Some make purchases with revolving credit that they would not have made if the cost of credit were quoted in more salient terms. Furthermore, firms can sell more goods and/or extend credit at a higher price if they use revolving credit rather than installment credit. And revolving credit is more likely to support a shrouded equilibrium than more salient forms of credit.

The second part of the paper investigates if creditors use revolving credit to take advantage of consumer myopia of credit prices and operate in a shrouded equilibrium. Alternatively, creditors can choose to educate consumers on the true cost of revolving credit and compete on these costs. To identify the existence of a shrouded equilibrium, I study how credit market price dynamics vary with price disclosure methods in the U.S. mail-order catalog industry. Specifically I examine if firm behavior is consistent with the following predictions from shrouding theory: First, firms will be able to charge higher prices on credit with revolving credit than with installment credit. Second, the price of revolving credit will be less sensitive to its marginal cost (i.e., the cost of funds) than the price of installment credit will be. Third, if revolving credit permits a profitable shrouded equilibrium, it is more likely that all firms will adopt revolving credit rather than compete using more salient installment credit. And fourth, less efficient high-cost firms should only offer revolving credit plans while more efficient low-cost firms could choose to also offer installment credit to attract sophisticated consumers who are able to discern total prices accurately.

In order to conduct the analysis, I construct a new data set of credit terms spanning the 1920s to the early 1990s from credit plans found in the major U.S. mail-order catalogs of the twentieth century: Sears, Montgomery Ward, J.C. Penney, Aldens, and Spiegel. Before the rise of credit cards, retailers were a major source of (nonautomobile and nonmortgage) consumer credit in the United States for the majority of the twentieth century. This dataset provides a new glimpse at the pricing of consumer credit through time before such information was consistently and formally collected.

Using this new dataset, I find firm behavior that is consistent with predictions from shrouding models. First, all firms increased their highest charged finance rate when they adopted revolving credit for some range of loan amounts. Second, though both installment and revolving
credit demonstrated some degree of price stickiness, revolving credit was less sensitive to movements in cost of funds, while installment credit had historically been sensitive to downward price pressure. Third, all major mail-order firms introduced credit in revolving terms within two years of each other. Eventually all mail-order firms retired their installment credit plans. And when a new player, J.C. Penney, entered the mail-order catalog industry, it only offered credit in revolving terms. Hence, firms showed a preference for revolving terms over installment terms. Fourth, firms that completely abandoned installment credit when they adopted revolving credit were also those who faced relatively more expensive cost of funds. And more efficient firms offered cheaper installment credit along with more expensive revolving credit for a significant period of time without any indication that revolving credit issuers were experiencing pressure to unshroud. This suggests that the two types of credit attracted different types of consumers and that consumers who used revolving credit were potentially exploited.

The implications of the experimental and historical findings is that the most effective policies to counter overconsumption and encourage price competition would need to increase salience of the cost of revolving credit with tools other than interest rates and before consumers make purchasing decisions.

This paper contributes to various strands of literature. First, it directly complements the theoretical literature on shrouding of price by providing experimental evidence of the channel for shrouding as well as empirical historical examples of firm behavior. It also complements other empirical works that have found evidence of shrouding in the credit industry (e.g., Alan et al., 2015; Agarwal et al., 2015a, 2017). Second, it contributes to economic history literature by the construction of a new dataset of consumer credit terms and documentation of consumer credit costs over previously undocumented periods of the twentieth century. The dataset presents changes of credit terms over significant historical events, such as the Great Depression, World War II, and the enactment of the Truth-in-Lending Act as well as the adoption of revolving credit. The paper specifically contributes to the strand of literature that addresses credit card rate stickiness (Ausubel, 1991; Calem and Mester, 1995). It highlights that rate stickiness was occurring decades before it became apparent in the credit card market in the 1980s, that rates were not always as sticky prior to the innovation of revolving credit, and that salience of credit prices can also explain stickiness, even when abstracting from other leading theories such as search costs, switching costs, and adverse selection. Finally the paper contributes to consumer
credit literature and especially the subset that relates to mistakes that consumers make with credit (Ponce et al., 2017; Gathergood et al., 2017; Stango and Zinman, 2015, 2014, 2009b; Agarwal et al., 2008, 2009; Gross and Souleles, 2002). Unlike most of this literature, this paper focuses on mistakes in purchasing and credit origination rather than on credit allocation or repayment mistakes.\(^3\) Furthermore, the mistakes that this paper highlights concern the primary price for a ubiquitous type of credit rather than fees for additional services (e.g., overdraft or late payment fees). Finally, by measuring both inattention (accuracy and time spent on calculations of credit payments) and shocks to salience of credit costs (method of quoting credit prices), this paper more directly measures limited attention to credit costs than previous work in this literature.\(^4\)

The remainder of the paper is organized as follows. Section 2 describes the experiment and its findings. Section 3 investigates the existence of a shrouded equilibrium historically in the mail-order catalog industry. And Section 4 discusses the implication of these findings and concludes.

2. Experiment

2.1 Experimental Procedure and Design

Through the online labor market Amazon Mechanical Turk (MTurk), 1,477 participants were recruited over 3 days in February 2017.\(^5\) Participants were limited to those who lived in the United States, spoke English, were over the age of 18, and had at least a 90% MTurk task completion rate.\(^6\)\(^7\) 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.

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\(^3\) Several papers address if consumers optimally accept credit card offers by examining their post-offer debt accumulation behavior (Shui and Ausubel, 2005; Agarwal et al., 2015b).

\(^4\) Stango and Zinman (2014) shock the salience of overdraft fees by use of surveys. Alan et al. (2017) shock the salience of overdraft fees by text messages.

\(^5\) 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 et al., 2012 and Paolacci et al., 2010).

\(^6\) In two instances, recruitment postings also added the criteria that participants needed to have completed at least 100 previous MTurk tasks. This does not seem to be a binding condition among the majority of recruited participants. Furthermore, dropping responses of all participants who were recruited at the time that this extra criteria was posted does not change the results presented in this section.

\(^7\) I also prevented people from taking the study more than once (through IP address and Worker ID checks) and disqualified people who restarted the experimental instrument multiple times.
Those who chose to participate in the study were directed to an online tutorial. In the tutorial, participants learned that they would be presented with an income stream of $5 a month for 13 months starting in a month. They could use this money to make a purchase from a set of specially priced Amazon Gift Cards⁸ (see Figure 1). Since this income stream was intentionally insufficient to make immediate purchases of gift cards, participants were told that they could purchase a desired gift card by first forgoing income stream payments until they had “saved” up enough money to cover the cost of the gift card. After forgoing enough payments, participants would receive a claim code to redeem the Amazon Gift Card. Remaining income stream payments would then resume as scheduled. Some participants were also offered an additional purchasing method, “credit,” which enabled participants to receive a gift card more immediately.⁹ If participants purchased with credit, they then started a credit balance, and that balance would then be paid off through automatic monthly withdrawals from the income stream. Once the credit balance was fully paid, any remaining income stream payments resumed as scheduled. After participants had completed the tutorial and answered questions to demonstrate comprehension, they were asked to make their purchasing decisions (see Figure 1).¹⁰ First, they were asked to decide what to purchase (they could also buy nothing at all). Second, if participants had a credit plan option and wanted to make a purchase, they had to indicate whether they would like to purchase with credit or by savings. To motivate honest responses, participants were told that there was a 1 in 30 chance that they would receive the income stream and have their purchasing decision occur.¹¹

Credit plans offered to participants varied in price and quoting method. Participants received plans that charged an annual percentage rate (APR) of either 0%, 18%, or 42%¹² and were quoted in either installment terms or one of three revolving terms. Figure 2 presents

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⁸ Amazon Gift Cards where priced at 80% of their purchasing value.
⁹ Participants were informed that Amazon Gift Cards would be provided on the next business day.
¹⁰ Tutorial questions were open-ended and not multiple-choice. If participants were not able to answer the tutorial questions correctly, they did not move forward with the rest of the experiment. Tutorial questions did not 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). A sample tutorial is found in the Appendix.
¹¹ When a participant completed all questions in the study, he 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.
¹² Regardless of type of credit plan quoting method, credit cost or cost of desired gift card, all plans list the same required monthly payment of $5.
examples of the four possible quoting methods. The "installment" plan is pictured in Panel A and instructs participants to add a one-time service fee to the price of the gift card to calculate the starting credit balance. The first revolving credit plan, the "base" plan, is pictured in Panel B and informs borrowers of a monthly percentage rate (MPR) that would be applied every month to the outstanding credit balance. The second revolving plan, the "APR" plan, is pictured in Panel C and contains the same information as the "base" plan but also includes the annualization of the MPR (i.e., the APR). The third revolving plan, the "unshrouded" plan, is pictured in Panel D and contains the same information as the "base" plan except that it uses larger font size, underlines, bold font and red color to emphasize the service fee information in the fine print. Regardless of quoting methods, all credit plans with the same costs require exactly the same stream of monthly payments to pay off. Appendix Table 1 provides a crosswalk between revolving terms and installment fees for the varying gift card prices. As an example, revolving plans charging 1.5% and 3.5% MPR are equivalent to those charging 18% and 42% APR, respectively. And for a credit purchase of a $62.50 gift card priced at $50, an 18% APR credit plan is equivalent to a $4.58 installment credit fee, and a 42% APR plan is equivalent to a $12.63 installment credit fee. For ease of exposition, I will refer to the cost of all credit plans in APR terms regardless of how the plan was quoted to participants.

After making their purchasing decisions, participants who received a credit option were also asked to calculate the number of months it would take to payoff a credit balance of a Gift Card priced at $40 if it were purchased using a 42% APR credit plan quoted in the method of their previously assigned credit plan (see Figure 3).

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13 The APR is required to appear on credit plans ever since the 1968 Truth-in-Lending Act. Due to the prevalence of APR, I include an arm with credit quoted in APR in case participants are more familiar with credit quoted in this method.

14 Revolving credit varies from installment credit not only by using an interest rate to quote price, but also by placing that information in fine print. The "unshrouded" credit plan aims to make the information in the fine print more prevalent and less hidden.

15 This experimental setup is an intentional simplification of options typically available in revolving credit that offer borrowers an array of ways to pay off credit balances including the option to pay the balances in full before incurring any interest charges. The income stream provided in the experiment and the minimum monthly payments required by the credit plans do not allow for early prepayment of the credit balance or any variation in the stream of payments to pay off credit balances. This simplification is made in order to isolate the effects of relaying credit cost obligations through use of revolving terms from the effects of borrower over-optimism of repayment speed that is proposed in Ausubel (1991).

16 To encourage effort, participants were told that one participant from the pool of those who answered this question correctly would win $10 through a random draw.
2.2 Framework

If credit costs are tangible and fully considered with both quoting methods, then the level of demand for credit and goods will be equivalent between the two quoting methods. Furthermore, demand for credit or goods will decrease as credit costs increase. Specifically, participants who only purchase if they can obtain the good immediately will decrease their demand for both credit and goods as credit costs increase. Others who make a purchase regardless of the availability of credit decrease their demand for only credit as credit costs increase by simply substituting purchasing through savings for purchasing through credit. However, if one quoting method relays information about credit cost more tangibly than another does, then we should see a divergence between quoting methods in the level of demand for credit and goods. What the divergence would look like varies from model to model. In some models (e.g., persuasion game in Milgrom (1981)) rational consumers assume that if credit cost information is unclear or hidden it must mean that it is expensive. Participants of this type will consume weakly less credit/goods when faced with the less salient quoting method than with the more salient quoting method. They will also be, to some degree, more sensitive to credit price increases. In the most extreme case, they will completely stop using credit as soon as they stop understanding credit costs (e.g., this can happen when credit costs increase from 0 to a positive number) and will be insensitive to further increases in credit costs, because demand cannot be negative.\footnote{In such a case, the largest divergence in demand between quoting methods will occur at lower-priced credit.} A shrouded equilibrium cannot exist if all consumers are this type because it would be optimal for firms to unshroud and compete on total price. In other models (e.g., the shrouding models in GL2006, HKM2017), consumers ignore or do not consider credit costs that they do not understand or notice. Participants who behave this way will consume weakly more credit/goods when faced with the less salient quoting method than with the more salient quoting method. They will also be less sensitive to credit price increases. In the most extreme case, they will always use credit regardless of cost. The existence of this latter type of participant is necessary for the existence of a shrouded equilibrium in shrouding models. And the smoking gun for their existence in the experiment would be instances of higher demand under the less salient quoting method than under the more salient quoting method.
2.3 Results

The calculation question provides strong evidence that installment terms are much more salient to participants than revolving terms. The correct response to how long it would take to pay off a credit balance of a $40 purchase with a credit plan that costs 42% APR (or a $7.77 one-time installment service fee) and requires a minimum payment of $5 per month is 10 months. The distribution of responses based on credit quoting method can be found in Panel A of Figure 4. We see immediately a very striking pattern. The majority of participants in the revolving arms respond incorrectly. The most popular response is 8 months, a response that indicates confusion or a lack of consideration of credit costs altogether. Even in the revolving credit arm that emphasizes credit cost information in the fine print the participants do badly. Only 20% answer correctly. In stark contrast, 60% of installment arm participants answer correctly. To add to this, installment arm participants take significantly less time compared to their revolving arm counterparts to arrive at these overwhelmingly correct responses. In Panel B of Figure 4, we see the average time (in seconds) spent on the calculation question. Installment plan participants spent an average of 65 seconds on the calculation question, while revolving credit plan participants averaged between 97 and 145 seconds. In fact we see in Appendix Table 8 that those who got the answer correct among installment credit participants spent 1.08 minutes on the question while those who got the answer correct among revolving credit participants spent almost 4 times longer on the question at 4.26 minutes. Even when precisely the same credit cost information is being communicated to consumers, these results demonstrate how much more taxing revolving credit terms are compared to installment terms.

With these results in mind, I turn to the effects of differences in salience of credit-quoting methods on borrowing and purchasing decisions. The main findings are presented in Figure 5.

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18 Since there were no questions in the tutorial that specifically asked participants to demonstrate understanding of their total credit cost obligation over the life of the loan (to avoid biasing what is being tested in the experiment), it is possible for participants to put little effort in understanding the credit plan apart from learning what their monthly required payment would be. 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 30 seconds examining their credit plan in the tutorial section. Conclusions are not changed if I include these participants.

19 Soll et al. (2013) ask a similar calculation question using credit quoted in revolving terms, to adults recruited from a national panel, and also find that participants underestimate the time it takes to pay off a credit balance.

20 Hence, it is unlikely that the results are driven by participants in revolving arms deciding not to put effort into answering the question correctly, potentially due to seeing fine print.
(and the corresponding Appendix Tables 2–5). Panel A and B summarize the percentage of participants in each experiment arm who use any credit and make any purchase, respectively. Panel B shows that approximately 60% of participants in the no-credit arm make a purchase of a gift card. Of those offered credit at a cost of 0% APR, 79% and 77% purchase a gift card, and 53% and 49% use credit among installment and pooled revolving credit arms, respectively.\(^{21}\) At 0% APR, none of these differences by quoting method of demand – for either gift cards or credit – are statistically significant at the 15% level.

Divergence, however, appears as credit costs become positive. We see that as the cost of credit increases from 0% to 18% APR, the percentage of participants who use credit decreases significantly for both types of quoting methods, while the percentage of people making any purchase of gift cards stays approximately the same.\(^{22}\) This result indicates that at least some participants recognize a difference between 0 and positive credit cost, even when this information appears only in the fine print. The divergence occurs because revolving credit arm participants are more sensitive to the credit cost increase than are installment arm participants. Specifically, at 18% APR, 37% of installment arm participants demand credit while only 25% of revolving arm participants do, levels that are statistically different from each other at the 5% level. Assuming that revolving terms are less salient than installment terms, then this difference in demand is consistent with the existence of participants who assume that if credit cost information is unclear then it may likely be expensive.\(^{23}\) Such participants consume less credit than is optimal when credit is quoted in revolving terms rather than more salient terms. Hence, their existence alone could not support a shrouded equilibrium through the use of revolving credit.

However, as credit costs increase from 18% to 42% APR, the existence of a different type of participant becomes apparent. While installment arm participants significantly decrease

\(^{21}\) 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 the gift cards at a future date rather than immediately.

\(^{22}\) Thus the participants who stop using credit when costs increase to 18% APR or become positive, "always purchasers," desire to purchase gift cards regardless of availability of credit.

\(^{23}\) Another possible explanation is participants who have "payment/interest bias," which is the tendency to underestimate the interest rate on credit when calculating it from the principal and payment stream of installment terms (Stango and Zinman, 2009a). Under this explanation, it is installment terms that cause participants to use too much credit rather than revolving terms that causes participants to use too few credit. Neither this explanation nor the one presented in the main text identify participants that would support the existence of a shrouded equilibrium through the use of revolving credit.
their demand for both credit and gift cards, revolving arm participants have little to no reaction to the increase in credit costs.\footnote{Because participants stop purchasing gift cards as well as stop using credit when credit costs increase to 42\% APR indicates that these participants are "credit-only purchasers" that are only willing to purchase the gift card if they can receive it immediately. Otherwise, they would prefer not to make a purchase and to receive their income stream in full, instead.} Specifically, the percentages of installment arm participants who demand any credit and purchase any goods decrease by 18 and 19 percentage points, respectively, while the percentages of revolving arm participants who demand any credit and purchase any goods decrease by only 1.7 and 2.1 percentage points, respectively. At a credit price of 42\% APR, the percentage of participants who use any credit is approximately the same regardless of credit quoting method. However, the demand for gift cards is significantly higher for revolving arm participants than for installment arm participants. Specifically, at 42\% APR, 60\% of those who receive installment terms make a purchase, which is nearly the same demand as those in the no-credit arm of the experiment. In contrast, 72\% of those in revolving arms make a purchase, a statistically significant 12 percentage points higher than their installment credit counterparts.\footnote{The reason it is possible for credit demand to be relatively similar between quoting methods but for good demand to vary is due to the composition of credit users. Since we do not see any change among revolving term participants when credit cost is increased from 18\% to 42\% APR, it must mean that revolving terms were able to retain their "credit-only purchasers" and their corresponding credit demand. Hence, for credit demand to be fairly the same between quoting methods at 42\%, it must mean that installment credit users are composed of more "always purchasers" and revolving credit users are composed of more "credit-only purchaser." Refer to Appendix Figure 1 for a graphical representation of this story.} Assuming that revolving terms are less salient than installment terms, this difference in demand is consistent with the existence of participants who underestimate or do not consider credit costs when credit cost information is unclear.\footnote{Another possible explanation other than revolving credit being less salient than installment credit is that participants overweight the installment 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 provide some evidence against this explanation as participants are much more aware of their credit obligations under installment credit than they are under revolving credit.} When credit is quoted in revolving terms rather than in more salient terms, such participants consume more credit and goods than is optimal. Hence, their behavior can support a shrouded equilibrium through the use of revolving credit. Panels C and D of Figure 5 show participant behavior separated out by each type of revolving plan. We see in these figures (and in corresponding Appendix Tables 4 and 5) that including APR or emphasizing costs in the fine print does not result in significantly different behavior among participants who received revolving credit.
Though revolving arm participants do not completely stop purchasing gift cards or use of credit when credit costs increase from 18% to 42% APR, it is possible that they could be reducing the amount of credit and gift cards demanded. To address this possibility, I turn to the intensive margin of borrowing and purchasing in Figure 6 (and corresponding Appendix Tables 6 and 7). Panel A presents the average amount borrowed among those who borrow in each experiment arm, and Panel B presents the average price of a gift card purchased by those who make purchases in each arm. We see from both Panel A and Panel B that revolving arm borrowers and purchasers react very little to credit cost increases over the 18% to 42% APR range. Hence, these results further support the findings in the extensive margin analysis that there exist participants that overconsume credit and gift cards when credit is quoted in revolving terms. Furthermore we see in Panel A that at 42% APR, borrowers in revolving arms borrow $4.12 more than borrowers in the installment arm, a difference that is statistically significant at the 10% level. Hence, though the percentages of participants who use any credit are not statistically different between arms, the overall demand of credit is higher among revolving arm participants than among installment arm participants when credit is priced at 42% APR. As an aside, we see in Panel B that not only does credit access cause more people to make purchases (as seen in Figure 5, Panel B), but it also makes people purchase more compared to those with no credit access. This highlights why many retailers incorporate credit into their sales strategies.

2.4 Discussion

There are several main takeaways from this experiment. First, at the time participants make a purchasing or borrowing decision, simply disclosing an interest rate is not sufficient for conveying the tangible cost of revolving credit to borrowers. In other words, using revolving terms does a poor job compared to its closed-end historical predecessor at the isolated task of relaying a borrower's credit obligation over the course of a loan, holding a repayment stream fixed. This is because of the complexity of the calculation that revolving terms require borrowers to make at the time of credit initiation. Unfortunately, due to the structure of revolving credit, an interest rate is the most natural price information to disclose before any credit is actually used in an open-line of credit. Interestingly enough, early versions of what would become the Truth-in-Lending Act of 1968 did require prior disclosure of finance charges for revolving credit. However, revolving and other open-end credit were eventually exempt from such prior
disclosure when it was argued (by several parties including credit issuers and retailers) that such disclosures were impractical (Rubin, 1992).

Second, the diminished salience of revolving terms leads consumers to make nonoptimal borrowing and purchasing decisions. If credit is quoted in revolving terms, then some consumers will demand less credit and consume goods later than they would have if credit had been quoted in more salient terms. And conversely revolving credit can lead other consumers to overconsume and overborrow, even if they are not present biased (Laibson, 1997), simply because the cost of credit is not salient to them.

Finally, revolving credit is more likely to support a shrouded equilibrium than installment credit. This is because consumers have more difficulty incorporating credit costs into their purchasing decisions with revolving credit than with installment credit, a necessary feature for shrouding to occur.

These results complement the findings of previous studies. Seira et al. (2017) find that mailings that emphasize credit card interest rates do not have any impact on levels of credit card debt, delinquency, account closing, or switching. Bertrand and Morse (2011) find that presenting the possible accumulated fees for keeping a payday loan outstanding for varying lengths of time is more effective at reducing future payday loan borrowing than disclosure of payday loan APR along with the APRs of more traditional credit instruments. Their findings, though related, are different from those found in this paper. Payday loans are closed-end loans and disclose finance charges in addition to interest rates prior to initiation of the loan. Hence, payday loan borrowers receive both installment terms and revolving terms to begin with. Bertrand and Morse experiment on the most effective quoting method to relay the credit cost obligation that accrues if borrowers extended payday loans beyond their initial term through rollovers. In contrast, there is no uncertainty or option to vary how long a credit balance is outstanding in this paper's experimental setting. Hence this experiment adds to Bertrand and Morse's findings that the myopia through interest rates is not only applicable to possible future borrowing but also to fixed deterministic borrowing.

3. Existence of Shrouded Equilibrium

27 Typically, payday loan borrowers rollover a loan by paying the interest/finance fee that is due on a loan's expiration date and re-enter into a payday loan contract (with the same terms as the original loan if the loan amount stays the same).
The previous section establishes that when credit costs are quoted in revolving terms a segment of consumers do not fully incorporate these costs into their purchasing decisions. In other words, revolving terms "shroud" the price of credit from consumers. Creditors who want to compete on fully transparent prices may choose to educate or "unshroud" prices for consumers. However, in certain settings it might be optimal for creditors to perpetuate this shrouding, which may harm some consumers. In this section I investigate if creditors use revolving credit to take advantage of consumer inattention by operating in a shrouded equilibrium. To do this, I study how credit market price dynamics vary with price disclosure methods in the U.S. mail-order catalog industry in light of predictions from shrouding theory.

3.1 Theoretical Framework

3.1.1 Theoretical Model

I directly apply the shrouding model of HKM2017 to a setting in which retailers of goods are also creditors, as is the case in the U.S. mail-order catalog industry. In a two-period model, \( N \geq 2 \) retailers compete for liquidity-constrained consumers in a simultaneous-move game in the first period, in which retailers set the transparent price of goods \( g_n \), the interest rate on credit \( R_n \in [0, \bar{R}] \), where \( \bar{R} > 0 \), and decide whether to unshroud \( R_n \). The price of credit is shrouded when quoted in revolving terms. Furthermore, to unshroud it retailers would need to educate consumers on what the tangible cost of credit is when it is quoted in revolving terms. If consumers decide to make a purchase from retailer \( n \), they would receive the good in the first period and pay \( (1 + R_n)g_n \) in the second period. If no retailer unshrouds, then consumers make their purchasing decisions in the first period, believing that they are only obligated to pay \( g_n \) in the second period (i.e., they ignore \( R_n \)). However, if at least one retailer unshrouds, then all consumers can see the credit price from all retailers in the first period. Consumers vary in their valuation of the good received in the first period and have an outside option value from not making a purchase equal to 0. Let \( D(p) \) be the demand curve for the given expected total price \( p \) incurred in the second period based on the distribution of valuations for the good. \( D(p) \) has a choking price, \( p' \), such that \( D(p) = 0 \) for \( p \geq p' \). If some consumers decide to make purchases and they are indifferent between a subset of retailers, then each of these retailers split this demand in proportion to shares \( s_n \in (0,1) \). Retailers borrow the cost of goods, \( c_n^g > 0 \) and repay it in the second period at the cost of funds, \( R_n^c > 0 \). Let \( c_{\min}^g = \min_n \{c_n^g\} \) and \( R_{\min}^c = \min_n \{R_n^c\} \). For simplicity and to allow for a competitive Bertrand outcome, I assume that at least
two retailers have $c_n^g = c_{\text{min}}^g$ and $R_n^c = R_{\text{min}}^c$. I also assume that there exists $\varepsilon > 0$ such that $(p' - \varepsilon)(1 + R) > c_n^g (1 + R_n^c) \forall n$. Otherwise, a firm cannot be profitable and would be considered nonparticipating in the market. A key aspect in HKM2017 is the existence of a floor for the always-transparent price: $g_n \geq g > 0$. I assume that there is demand for the good if the perceived cost in the second period is at the price floor (i.e., $D(g) > 0$). Finally, I assume that $g \leq c_{\text{min}}^g (1 + R_{\text{min}}^c)$, indicating that the price floor is not so high that a zero-profit outcome cannot be achieved through choice of $R_n$. The setup of this model mimics that of HKM2017, and so the same propositions and intuition apply here. I characterize a portion of them in broad strokes in the following.

Since there is no incentive to shroud when at least one firm unshrouds, there always exists an unshrouded-prices equilibrium among possible Nash-equilibrium outcomes. If all prices are transparent, such as the case when credit is quoted in installment terms or when at least one retailer unshrouds, then a Bertrand price competition game occurs: equilibrium prices are a combination of $g_n$ and $R_n$ such that purchasing consumers in the first period expect to pay and actually do pay in the second period a total of $c_{\text{min}}^g (1 + R_{\text{min}}^c)$, selling retailers earn 0 profit, demand is $D\left( c_{\text{min}}^g (1 + R_{\text{min}}^c) \right)$, and only the most efficient retailers sell goods.

In a setting in which the price floor for the always-transparent price is not binding for any retailer (i.e., where $\frac{c_{\text{min}}^g (1 + R_{\text{min}}^c)}{(1 + R)} \geq g$), a shrouded equilibrium can occur. In this equilibrium, retailers use revolving credit terms, set the shrouded interest rate price to its highest value, $R_n = \bar{R}$, and correspondingly set the transparent good price to the lowest value where profits are not negative. The most efficient retailers (who face the lowest costs) will be able to offer the lowest transparent price of $g_n = \frac{c_{\text{min}}^g (1 + R_{\text{min}}^c)}{(1 + \bar{R})}$ and will be the only sellers in equilibrium. At these prices, retailers earn zero profit. Since consumers only see the transparent price in the first period, they expect to pay $\frac{c_{\text{min}}^g (1 + R_{\text{min}}^c)}{(1 + \bar{R})}$ in the second period if they make a purchase, but will pay

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28 Heidhues et al. (2012) provides a microfoundation for the existence of this floor.
29 $g > 0$ because $g_n = 0$ would produce 0 revenue regardless of value of $R_n$.
30 Among all retailers, $\frac{c_{\text{min}}^g (1 + R_{\text{min}}^c)}{(1 + \bar{R})}$ is the lowest value of $g_n$ that can be set such that any retailer maintains nonnegative profits.
the higher $c_{\min}^g (1 + R_{\min}^c)$ instead. Correspondingly, the demand for the good in a shrouded equilibrium will be $D \left( \frac{c_{\min}^g (1 + R_{\min}^c)}{1 + R} \right)$, which is greater than the demand in the unshrouded-prices equilibrium. Furthermore, $D \left( \frac{c_{\min}^g (1 + R_{\min}^c)}{1 + R} \right) - D \left( c_{\min}^g (1 + R_{\min}^c) \right)$ consumers are making purchases at prices higher than their value for the good. These consumers would not have made any purchase had total price been more salient.

In the setting in which the price floor for the always-transparent price is binding for all retailers (i.e., where $\frac{c_{\min}^g (1 + R_{\min}^c)}{1 + R} < g \forall n$), a profitable shrouded equilibrium can occur. Specifically, each retailer can set $R_n = \bar{R}$ and compete on the transparent price $g_n$ until reaching $\underline{g}$. At these two prices, the retailer would earn positive profits, given that the price floor is binding. To further increase market share, a retailer could unshroud and compete on total price. However, a retailer would not have an incentive to do so if the following "shrouding condition" holds:

$$s_n D \left( \frac{g (1 + \bar{R}) - c_{\min}^g (1 + R_{\min}^c)}{1 + R} \right) \geq \max_{p \in [g, g(1 + \bar{R})]} D(\bar{p}) \left( p - c_{\min}^g (1 + R_{\min}^c) \right),$$

where the left hand of the inequality is the profit a retailer receives if he does not unshroud and the right hand of the inequality is the maximum he could receive by unshrouding. If a retailer decides to unshroud and offers a total price ever so slightly below $g(1 + \bar{R})$, then he will immediately cause market demand to shrink from $D(\underline{g})$ to $D(\underline{g}(1 + \bar{R}))$. Hence, competing on the shrouded price by unshrouding is more painful for a retailer than competing on transparent price, as it may result in both consumers exiting the market and lowered markups. If the shrouding condition holds with strict inequality for all retailers, then a shrouded equilibrium exists where all retailers quote credit in revolving terms, set $R_n = \bar{R}$ and $g_n = \underline{g}$, and earn positive profits. Total market demand for the good will be $D(\underline{g})$. In the first period, consumers believe they will pay $\underline{g}$ in the second period if they make a purchase, but they will actually pay $\underline{g}(1 + \bar{R})$. Again, in a shrouded equilibrium, some consumers make purchases that they would not make had total price been more salient.

Unless retailers have internal price floor policies or are subject to manufacturer-imposed minimum resale prices, it is unlikely that the binding price floor condition for the transparent price, a necessary condition for a profitable shrouded equilibrium, holds, especially for large-
ticket items. This is because it is unlikely that a good priced at a naturally occurring price floor (e.g., at a level that just discourages arbitrageur consumers from entering the market) can produce enough revenue from the markup on credit to cover good costs. However, if merchandising and credit operations are decentralized enough, such that revenues and costs are not shared between departments, then a profitable shrouded equilibrium can occur. In such a case, the merchandising department would only set transparent price, would not receive any revenues from the credit markup, but would simply receive the cash price of the good as revenue. Similarly, the credit department would only set the price of credit, would only incur costs related to providing credit, and would earn finance charge revenue assessed on the (exogenously set) transparent good price. Since the merchandising department will not incorporate credit revenue when setting the transparent good price, it will set it close to the cost of the good and net 0 profit (i.e., the Bertrand outcome). This then becomes the price floor for the transparent price. The binding price floor condition is more likely to hold at this price floor and the credit department could then retain its profit from credit price markups. In summary, this theory predicts that the more credit operations are separated from merchandising operations, the more likely a profitable shrouded equilibrium can exist in the credit market through the use of revolving credit.31

There is some evidence that large retailers did in fact decentralize departments. In a presentation to other credit managers in 1961, John Gribbon, manager of the Department of Accounts of Macy's, outlines steps in making credit a "potent factor for increased profit for the store." He states:

> The credit department should be broken off from retail operations to take the form of a separate, autonomous entity. It is as though the credit department were to be [sic] become a completely different unit. It would have two sources of income: the service charges paid by customers, and a commission on credit sales paid to it by the store. This credit enterprise would be charged with its full share of costs, including not only the customary costs of direct operation, but also interest and overhead. Its primary goal, identical to that of the retail operation, would be to increase store profit. The measure of its effectiveness in fulfilling this requirement would be the bottom line of its operating statement.... And, like the merchandise division, the credit department would produce substantial additions

31 In a similar logic, Murooka (2015) and Herweg and Rosato (2018) find that a profitable shrouded equilibrium can exist in settings in which the sales force is separated from production (either through the use of sale intermediaries or through specific sales incentive contracts).
to store profit if it were to be operated under the net profit technique. The credit manager would be treated on the same basis as the merchandise manager in that he would be paid incentive bonus, so his success or failure, as well as his earnings, would be determined by the net operating results of his department. (Gribbon, 1961)

I also find evidence that this decentralization existed within J.C. Penney as its credit division charged its retail division 1% to 2% for credit sales (Trumbull, 2014). And such "decentralization" automatically arises when retailers start accepting bank-issued credit cards.

3.1.2 Model Predictions

As outlined in the model above, some consumers are worse off whenever retailers are operating in a shrouded equilibrium because they are making purchases at prices that are higher than their value for the goods. These consumers would be better off not purchasing at all. Given this negative outcome for consumers, it is important to explore if firms actually have operated in a shrouded equilibrium as a result of revolving credit. Alternatively, firms could offer revolving credit but operate in an unshrouded-prices equilibrium by educating consumers on its true cost and competing on price. The above model points to some signs that retailers may be operating in a shrouded equilibrium.

First, in a shrouded equilibrium, retailers price the shrouded attribute, credit, at its highest possible value. Hence, it is consistent with a shrouded equilibrium to see a movement to this price exactly when retailers adopt revolving terms with no corresponding movement in credit prices for retailers with no contemporaneous change in credit plan offerings. Furthermore, since consumers have difficulty translating the simplest of revolving credit terms to actual finance charges, it follows that any further manipulation to terms that complicate the calculation and increase price would also be shrouded from consumers. Hence, it would not be surprising to see retailers adopting innovations that increase shrouded price, further preserving the "shrouding condition" and deterring unshrouding.

Second, because the shrouded attribute is priced at its upper bound in a shrouded equilibrium, it will be sticky or nonresponsive to changes in marginal cost as long as the upper bound itself is not a function of marginal cost. In the credit setting, a plausible upper bound would be usury ceilings, which, unless pegged to market rates, can stay fixed for long periods of time until legislative changes occur. Hence, if retailers shroud with revolving credit, we should
see that credit price is not very responsive to changes in cost of funds because it would be set to the upper bound such as the usury ceiling. In an unshrouded-prices equilibrium, changes in cost of funds can be incorporated into the price of the underlying good and can also result in the appearance of price stickiness for the credit price. However retailers are much more flexible in changing credit prices in the unshrouded-prices equilibrium in reaction to changing costs than in the shrouded equilibrium. This is because credit price changes in an unshrouded-prices equilibrium are easily noticed by consumers through the good's total price. Hence, we should see that credit prices are more sticky when quoted in revolving terms than when quoted in installment terms. Similarly, one is more likely to see distinct changes from sticky to nonsticky credit price regimes under installment credit than under revolving credit as credit price regulations, such as price floors (ceilings), go in and out of being binding due to imposition or lifting of regulation (change in costs).

Third, if it is possible to use revolving credit in a profitable shrouded equilibrium, then we should see all retailers adopt revolving credit soon after its introduction into the industry. This is because retailers would prefer the positive profit afforded by revolving credit over the zero profit afforded by an unshrouded-prices equilibrium of salient installment credit. Not only that, but retailers who adopt revolving credit would desire that other retailers also adopt revolving credit as it would decrease the probability that any retailer will unshroud (HKM2016). This probability of unshrouding decreases even further if educating consumers on the true price of credit is costly.

Fourth, retailers who face higher costs should completely abandon installment credit and only offer revolving credit when revolving credit is introduced to the market. This is because they are not as competitive (and not at all if they sell identical goods) when they offer installment credit in an unshrouded-prices equilibrium. Retailers who face lower costs, however, may benefit from, or be indifferent to, retaining relatively lower-priced installment credit along with adopting more higher-priced revolving credit. This is because, as outlined in HKM2017, sophisticated consumers who can discern total price regardless of shrouding and who are unwilling to pay the shrouded price but who would purchase the good when it is priced at minimum cost would purchase the good in the unshrouded-price equilibrium through installment credit. In the same setting, "myopic" consumers who ignore the shrouded price would prefer to purchase using revolving credit because total price would appear cheaper to them than if they used installment.
Interestingly enough, the presence of cheaper installment credit further deters unshrouding, rather than encourages it, as any high-cost retailer would lose all customers to low-cost retailers in the event of unshrouding. In addition, low-cost retailers would have less of an incentive to unshroud revolving credit if they themselves have a large share of the revolving credit market.

3.2 Setting Background and Data

I investigate the existence of a shrouded equilibrium in the U.S. general merchandise mail-order catalog setting. Retailers in this market offer department store merchandise (e.g., furniture, appliances, apparel) through catalogs and deliver them to consumers by mail. There were four major market players early in the twentieth century: Sears, Montgomery Ward, Spiegel, and Aldens. A fifth, J.C. Penney, entered the catalog market in 1963. Based on 1963 company annual reports, catalog sales from three of these retailers Sears, Montgomery Ward, and Spiegel captured a 55%, 21.6%, and 14.1% share of the general-merchandise mail-order company market, respectively – 90.7% in sum. And according to the Monthly Retail Trade Reports released by the U.S. Department of Commerce and Bureau of the Census, "mail-order houses" accounted for 11.3% of nationwide department store sales in 1963. All of these catalog retailers offered credit to facilitate and encourage sales. In fact, retailers in general were a major (formal) source of small-dollar nonautomobile consumer credit for the larger part of the twentieth century, as seen in Appendix Figure 2. Retail credit was also fairly accessible and pervasive. For example, in 1981 57% of U.S. households held at least one Sears credit card (Mandell, 1990; see Appendix Table 1). It was only in the 1980s that bank credit cards overtook retail-issued credit (Hyman, 2011), as seen in Appendix Figure 3.

Three types of credit appeared in catalogs at some point, sometimes concurrently: charge, installment, and revolving. Charge accounts gave customers, at no cost, a window of time, typically 30-days after purchase, to pay for a good in full. That is, charge accounts essentially charged customers 0% APR for short-term credit. Installment and revolving accounts are as

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32 Several of the mail-order catalog retailers also had physical retail stores and offered credit in those stores as well.
33 Consumers did take out personal loans from commercial banks, finance companies and other institutions for various purposes including consolidating their retail credit (Hyman, 2011). However, when purchasing goods, evidence points to obtaining credit directly from the retailers (or retailer-contracted finance companies). For example, very few of the respondents to the Spring 1961 Survey of Consumer Attitudes and Behavior who had made recent credit purchases from local stores or department stores claimed to have obtained their credit from a bank or other financial institution.
previously described in the paper with the addition of a grace period for revolving credit. Examples of installment and revolving plans as they appeared in catalogs can be found in Figure 7.

Data was collected from Sears, Aldens, Montgomery Ward, Spiegel, and J.C. Penney catalogs and spans spring 1928 through spring 1994, though no one company covers that entire range. Credit plan information was only recorded when plans covered an array of goods in the catalog rather than when a plan was specified for each good individually. It was not uncommon for several credit plans to exist in a single catalog covering different product types.

Credit plan information gathered includes ranges of loan amounts, monthly payment requirements, finance fees, and fee calculation procedures. From this information, I am able to construct a time series of credit prices for each catalog credit plan. First, I determine the stream of payments required to pay off various borrowed amounts from each plan. For revolving credit, I determine the payment stream that results from only paying the minimum monthly requirements. Second, I use the payment streams to calculate my main price variable of interest: the annualized internal rate of return (IRR). The internal rate of return is defined as the interest rate for which the net present value of the cash flows is zero; in other words, it is the interest rate such that the borrowed amount is equal to the expected value of the monthly payments under credit. The equation used to calculate the IRR is:

\[
0 = NPV = -Borrowed\text{ Amount} + \sum_{n=1}^{n} \frac{Monthly\ Credit\ Payment_n}{(1 + IRR^n)}.
\]

I annualize the IRR by multiplying it by 12. To my knowledge, this is the first study that documents consumer credit prices over the span of the twentieth century, as the Federal Reserve did not systematically collect finance rates from consumer lending institutions until 1971 (Hull and Davidson, 1973).

3.3 Results

Figures 8, 9, 10, and 11 present the annualized internal rate of return for borrowing $40, $100, $200, and $300, respectively, on various credit plans offered by mail-order catalogs.\(^{35,36}\)

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\(^{34}\) Catalogs’ credit plan information was gathered from catalogs from various libraries, archives, online resources, and purchases from EBay.

\(^{35}\) All values in this paper are nominal as APR is nominal. Real values and IRR for other loan amounts can be provided on request.
Installment plans are in shades of red, and revolving plans are in shades of blue. Diamonds represent plans that only cover appliances, furniture and other specified durables, and circles represent plans that cover all goods in the catalog.

3.3.1 Price Jump and Manipulation of Terms

In a shrouded equilibrium, retailers will price revolving credit at its highest possible price. Hence, if installment credit is not already priced at that level, we should see sharp movements toward this price upon adoption of revolving credit. This credit price ceiling could possibly be determined by regulations, such as usury ceilings, or naturally occurring as the highest price that does not illicit price awareness of consumers or regulators. From various contemporaneous sources, it appears that the maximum revolving credit price in the late 1950s was 1.5% a month or 18% APR. Specifically, the highest rate of revolving credit ever reported in several formal and informal surveys conducted by the Credit Management Division of a retail trade association, the National Retail Dry Good Association, from 1956 through 1958 was 1.5% a month.\(^3^7\) And according to their 1958 survey, 75% of their retail store respondents who offered revolving credit charged 1.5% a month.\(^3^8\) At the same time, states were starting to regulate retail credit.\(^3^9\) For example, the assistant treasurer of the department store Kresge-Newark noted in an article in 1957 that "New York State has passed a law limiting, among other rates, revolving credit service charges to 1.5% on balances up to $500 and 1% on balances over $500" (Roberts, 1957). If 1.5% a month is indeed the price ceiling on revolving credit and there is a shrouded equilibrium, then we should see the price of credit jump to 18% APR upon adoption of revolving credit.

We see from Figures 8, 9, 10, and 11 that mail-order retailers offer installment credit in the first half of the century and adopt revolving credit towards the late 1950s and early 1960s. The price of installment credit has an inverse relationship with the borrowed amount. Specifically, in the 1950s, a $40 loan is priced at around 24% APR while a $300 loan ranges

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36 I drop credit plans for home modernization loans that covered the same items applicable for Federal Housing Authority (FHA) backed Title 1 Loans.
37 National Retail Dry Goods Association (1956, 1957) and Trotta (1958)
38 22% charged 1% a month.
39 As noted in Curran (1967), most states did not consider retail credit to be under usury regulation before 1957. This is because the courts viewed goods sold on credit as being sold at a different price than cash price, which was not illegal. However, with the prevalence of credit use, lawsuits emerged claiming usury violations that led to the enactment of stricter regulations on retail credit in some states throughout the 1960s.
from 8 to 15% APR. Spiegel is the first to offer revolving credit in its fall 1958 catalog. Sears, Montgomery Ward and Aldens follow suit in fall 1959, spring 1960 and fall 1960, respectively. We see that, consistent with a shrouded equilibrium, each retailer prices revolving credit at the afore-mentioned "highest price" of 18% APR immediately upon date of adoption. And we see no corresponding credit price changes among the other retailers who do not have changes in credit plan offerings on these same dates.\textsuperscript{40}

Large installment credit loans are less expensive and small installment credit loans are more expensive than 18% APR, around the time of revolving credit adoption. Despite some losses on small loans, it is very possible that overall credit revenue per dollar loaned increases with the use of revolving credit. First, for symmetric increases and decreases of loan sizes around a $100 loan, the gains in interest revenue due to the increased price from revolving credit of larger loans are greater than the losses due to lowered price from revolving credit of smaller loans, even when holding monthly payments constant between installment and revolving plans.\textsuperscript{41} For revolving credit to be profitable based on this fact, a sufficient number of high-balance revolving credit accounts need to exist relative to the number of low-balance revolving credit accounts. This seems plausible, since the average revolving account balance at Aldens and Sears in 1960, based on company annual reports, was $113 and $89, respectively. Second, revolving credit provides a smooth and straightforward way to charge "slow paying" charge account holders. Charge account holders agree to pay their balance in full within 30-days. However, charge account holders typically do not incur any financial penalties for not fulfilling this obligation. And if they do incur a penalty, it would typically not occur until 90 days after purchase.\textsuperscript{42} Hence, adoption of revolving credit with 30-day grace periods essentially raises the price of charge accounts from 0% to 18% APR.\textsuperscript{43}

\textsuperscript{40} See Appendix Figure 4 for a clearer comparison of credit plan interest rate changes between retailers during this transition period.

\textsuperscript{41} As an example, as seen in Appendix Table 10, a $100 loan nets $10 in total interest charges over the length of the loan using the Spring 1958 Spiegel \textit{installment} plan. Holding monthly payments constant to those in the 1958 installment plan, a $100 would net almost the same amount of interest charges using the Spring 1959 \textit{revolving} plan over the same amount of time. If the loan were $60 smaller (i.e., a $40 loan) it would net $4 under the installment plan and $2.94 under the revolving plan, holding monthly payments constant between plans, a $1.06 loss. However, if the loan were $60 larger (i.e. a $160 loan) it will net $16 under the installment plan and $19.85 under the revolving plan, holding monthly payments constant between plans, a $3.85 gain.

\textsuperscript{42} Based on a 1958 survey conducted by the Credit Management Division of the National Retail Merchants Association (Trotta, 1958), 72 out of 152 department and specialty store retailers (47%) did
Third, we see that revolving credit enables retailers to subsequently adopt innovations related to the finance-charge calculation that increase its price, sometimes in ways that specifically target prices on small loans. For example, retailers add a minimum monthly finance charge, such as $0.50, that particularly increases APR charged for small loan amounts. We see in Figure 8 that the large price jumps of revolving credit price for $40 loans are due to inclusion or augmentation of this minimum monthly finance fee. Another common innovation aimed to increase credit revenues is calculating the finance charge based on the average credit balance of the previous month rather than based on the credit balance at the beginning of the current month (after a monthly payment would have been received).

Altogether, the adoption of revolving credit from installment credit leads to a jump in average price of issued credit, which is consistent with the existence of a shrouded equilibrium.

3.3.2 Credit Price Stickiness

Next, if retailers shroud with revolving credit, then we should see that revolving credit prices are stickier than installment credit prices in response to changes in cost of funds. To proxy for the movements of cost of funds, I use the rate on the 3-month Treasury bill in analysis.\footnote{And from all indications from data in company annual reports, cost of funds of mail-order retailers move in lockstep with Treasury rates (See Panel A of Appendix Figure 5).} Stickiness of revolving credit prices is most evident when looking at larger loan amounts as seen in Figures 10 and 11.\footnote{Smaller loan amounts are more sensitive to the addition and changes to minimum monthly finance charges.} We see in these figures that though the price of installment credit experiences bouts of stickiness, it also experiences both upward and downward movements that correspond to movements in the cost of funds. For example, from 1931 to 1941 the rate of the 3-month Treasury bill decreased by 2.03 percentage points; over the same time period, the prices of installment credit on a $200 loan in Sears and Montgomery Ward catalogs decreased by 1.14 and 1.89 percentage points, respectively. Similarly, from 1954 to 1957 the rate on the 3-month Treasury bill increased by 2.29 percentage points; over the same time period, the prices of

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not assess any late charges on delinquent charge accounts. Of the remainder of retail stores, 61 out of 80 (76\%) did not assess a late charge until after 90 or more days.\footnote{Prior to the introduction of revolving credit Aldens and Montgomery Ward offered credit on installment with a policy to not charge any finance charges if the balance was paid in full within 30 days. Hence these two firms did not offer 0\% APR credit after 30 days. Upon adoption of revolving credit, all mail-order retailers offered a 30-day grace period only through their revolving credit contract. If they continued to offer installment credit, it was through a separate contract that did not contain language relating to a grace period.}
installment credit on a $200 loan in Spiegel, Aldens, Sears and Montgomery Ward catalogs increased by 2.18, 2.45, 1.85 and 2.44 percentage points, respectively. Revolving credit prices, in contrast, are extremely sticky. If there are any movements in price, they are almost all in the upward direction. For example, from 1960 to 1968, the 3-month Treasury bill rate increased by 2.47 percentage points; over the same time period, the prices of revolving credit on a $200 loan in Spiegel, Aldens, Sears and Montgomery Ward catalogs barely moved with increases of 0.17, 0.50, −0.01 and 0.42 percentage points, respectively. In contrast, over the same time period, the prices of installment credit on a $200 loan in Sears and Montgomery Ward catalogs increased by 2.94 and 2.04 percentage points, respectively. Revolving credit prices rarely decrease even when cost of funds is experiencing sharp declines. From 1980 to 1990, we see extreme declines in the 3-month Treasury-bill rate, yet the prices of revolving credit in Spiegel, Sears and J.C. Penney catalogs did not decline correspondingly – if at all. Complementary to these findings, the rates on credit cards in the 1980s are also found to be extremely sticky compared to rates on other (nonrevolving) credit instruments, despite being in a market with low barriers to entry and many players (Ausbubel, 1991).

We also see examples of installment credit exiting and revolving credit remaining in regulation-induced bouts of price stickiness once regulations are no longer binding. Specifically, under Regulation W, the Federal Reserve enacted several varying restrictions on credit to discourage consumption of durables and deter inflation during war and postwar efforts in three separate periods between 1941 and 1952. As a result of Regulation W, we see that installment credit prices, especially for larger loans, increased. However, we also see that, generally, installment credit prices in catalogs fall as soon as regulations are lifted. In contrast, revolving credit prices remained at their "binding usury ceiling" levels established in the early 1980s long after the cost of funds significantly declined over the remainder of the decade.46

These observations document that the price of revolving credit is stickier than the price of installment credit, consistent with the existence of a shrouded equilibrium. The only exception to this is the pricing of revolving credit at J.C. Penney. As seen in Figure 10, prior to 1974, J.C.

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46 Several retailers report losses in credit operations in their annual reports in the late 1970s and early 1980s and attribute these losses to the high cost of funds environment during this inflationary period. This points to the likelihood that usury ceilings were binding. As a result, states raised usury ceilings (Sears reports that higher credit rate ceilings were legislated in 23 states in its 1981 annual report), and we see retailer credit prices jump exactly at this time in Figures 9, 10, and 11.
Penney priced revolving credit lower than the 18% APR of its competitors. And the price of its more general revolving plan slowly trended upward corresponding to the trends of cost of funds. Hence, J.C. Penney did not seem to be participating in the optimal pricing strategies afforded by a shrouded equilibrium. According to Trumbull (2014), this is consistent with the philosophy of its founder who established J.C. Penney as a cash-only retailer. Though James Cash Penney acknowledged that credit would increase sales and profits, he was morally opposed to offering it, believing it would cause consumers to enter into financial difficulty. As a result, J.C. Penney did not offer credit until 1958, much later than its competitors did and only after the retirement of its founder (who stayed on as a board member). Even upon adoption of credit, J.C. Penney emphasized its stance that credit was to be used only as a tool to promote merchandise sales and not as one to profit from credit finance charges themselves. And, indeed, early credit policies seem to be consistent with this. Most strikingly, J.C. Penney, citing consumer fairness, was the only mail-order retailer to buck industry trends, at least up till 1974, by calculating finance charge based on the credit balance at the beginning of the current month rather than on a function of the balance from the previous month. The fact that J.C. Penney offered cheaper credit for a prolonged period of time without inducing pressure on other retailers to match prices or to unshroud further illustrates the lack of salience of revolving credit.\footnote{Interestingly enough, Sears, Montgomery Ward, and Spiegel did demonstrate wariness of J.C. Penney's cheaper credit pricing to the extent that they backed away from several years of opposition to annual (rather than monthly) percentage rate disclosures on revolving credit during the Truth-in-Lending Act legislative process once they realized that monthly percentage rate disclosures would enable J.C. Penney to better emphasize its cheaper pricing (Rubin, 1992).} Quite the opposite, J.C. Penney eventually relented to exploit greater profit opportunities and mimicked the credit-pricing strategies of other retailers. Bolstering the findings of the experiment in this paper and the hypothesis of a shrouded equilibrium, the head of the credit division of J.C. Penney explains the impetus for doing this, "In the past, consumers have generally not been rate-sensitive. Our surveys have consistently shown that they are more concerned about annual card fees than finance charge rates."\footnote{J.C. Penney Corporate Records, Credit: Credit Rates, 1986–1987, Ralph Spurgin, "Presentation: JC Penney Finance Charge Rates", Management Council, January 27, 1986, 11. as reported in Trumbull (2014).}

A possible alternative explanation to credit price stickiness, other than a shrouded equilibrium, is that revolving credit prices might simply appear to be sticky because they are constrained by usury ceilings. If this were the case, we should expect to see rationing of credit as
the cost of funds increases. Though I do not have information on credit-application rejections or credit-account closures for the mail-order catalog retailers, I do have information on credit terms and credit sale volume. We see in Appendix Figure 6, which presents the highest required monthly payment for a given credit balance, that revolving credit terms became more liberal despite cost of funds increasing in the 1960s. Since more liberal terms should attract more liquidity-constrained individuals, it seems unlikely that firms are facing binding rate ceilings at all times that rate stickiness exists. Furthermore, we see in Appendix Figure 7 that credit sales grow faster than cash sales, even in periods when cost of funds is increasing. Finally, in light of the credit card interest rate stickiness that became apparent in the 1980s, Ausubel (1991) and Calem and Mester (1995) propose search costs, switching costs, and consumer over-optimism of repayment behavior combined with adverse selection as possible explanations. Though some of these factors may very well exist in the mail-order catalog credit setting, they cannot explain why the price stickiness of revolving credit should vary from the price stickiness of installment credit.49

3.3.3 Quick Adoption of Revolving Credit

If revolving credit can support a profitable shrouded equilibrium and installment credit cannot, then we should see that retailers have a preference for, and quickly adopt, this potentially profitable technology soon after its introduction into the market. Indeed we see in the figures that all major mail-order retailers who initially offered installment credit in the first half of the century adopted revolving credit within a two-year window starting in 1958. When J.C. Penney entered the mail-order catalog business in 1963, it chose to offer only revolving credit despite piloting both revolving and installment plans in some of its physical stores in 1958.50 And we see that the number of installment accounts plateaued and declined, and that installment credit was

49 Ausubel (1991) proposes that good types borrow believing, incorrectly, they will repay quickly and not incur much interest charges; as a result, good types ignore credit cost information altogether when making purchases on credit. Bad (or riskier) types, on the other hand, know that they will incur interest charges and search for the cheapest creditor. Hence, it would not be optimal for creditors in this situation to compete on credit price, as it would attract bad types and lower profits on good types. In our setting, we see that at least two retailers attached 30-day grace periods to their installment credit plans, yet the extreme stickiness found in revolving credit did not manifest. Furthermore, credit terms generally became more liberal after adoption of revolving credit, which would attract more risky types to borrow.

50 According to its Annual Reports, J.C. Penney first started piloting credit in a subset of its stores in September of 1958. In 1959 J.C. Penney offered two types of credit plans at various stores: a revolving plan that charges 1.5% a month and an installment plan where 8% was added to the cash price. Credit was expanded to all stores by 1962. 1963 was the first full year of credit selling, coinciding with the release of J.C. Penney's first mail-order catalog.
eventually discontinued for retailers, such as Sears and Montgomery Ward, who did not immediately drop installment credit upon adoption of revolving credit (see Appendix Figure 4). In contrast, the number of revolving accounts quickly grew and eclipsed the number of installment accounts at these retailers. This preference for revolving credit was not only limited to mail-order retailers. In 1953, between 26% and 65% of retailers, depending on the size of the retailers, offered revolving credit, according to annual surveys conducted by the National Retail Dry Goods Association (Trotta, 1959). Just five years later in 1958, that range jumped to between 83% and 93% (Trotta, 1959).51

A possible alternative explanation for the popularity of revolving credit over installment credit is its seeming ease in allowing consumers to add more purchases at different points in time to a single credit account. However, every mail-order catalog retailer that offered installment credit also allowed and advertised the ability for consumers to "add-on" purchases to one installment account. The cash price of newly purchased goods plus the corresponding carrying or finance charge would be added to the installment credit balance and the monthly installment payment would be adjusted, if needed, based on the new balance size. That is, this feature of revolving credit already existed in installment credit when retailers chose to adopt revolving credit.

3.3.4 Substitution of Revolving for Installment among High-Cost Retailers, Retention of Installment among Low-Cost Retailers

Finally, in a shrouded equilibrium we should see that retailers that face higher costs adopt revolving credit and immediately abandon installment credit in order to appear more competitive. However, we should also see that retailers that face lower costs might retain both types of credit in order to sell to sophisticated consumers that can discern true total prices. Appendix Figure 7 shows that Sears and Montgomery Ward were much bigger retailers in terms of sales than Spiegel and Aldens. Hence we would expect that Sears and Montgomery Ward would be able to contract goods and credit at lower costs than their smaller competitors. And

51 Data on installment credit, though not as systematically collected, points in the direction of a decline. In a survey of 263 department and specialty stores from 41 states in 1949, 73% offered installment accounts while only 23% offered revolving accounts (Trotta, 1949). In a 1958 survey conducted by the same entity of 153 (mostly) department and specialty stores, a minimum of 76% offered revolving credit while a minimum of 64% offered installment credit (Trotta, 1958). It is difficult to surmise the actual percentage of stores with specific credit accounts due to the wording of the 1958 survey. So I infer these percentages from other responses of retailers on details of their credit accounts. Comparison between 1949 and 1958 is made more difficult given that the latter survey contains mostly department store respondents.
indeed we see in their annual reports that Sears and Montgomery Ward contracted long-term debt at a lower range of interest rates than Spiegel and Aldens (see Panel B in Appendix Figure 5). Correspondingly, we see in Figures 8 through 11 that Spiegel and Aldens immediately dropped installment plans upon adoption of revolving credit. In contrast, Sears and Montgomery Ward offered installment credit for around 19 and 10 years, respectively, after adoption of revolving credit into their catalogs.

4. Concluding Remarks

Consumer credit price disclosures in the United States transitioned from intuitive measures used in installment credit to more complex measures – interest rates – used in revolving credit. And it is likely, according to the experimental findings of this paper, that such a transition has caused consumers to make nonoptimal borrowing and purchasing decisions, including purchasing goods that would not otherwise be purchased had credit costs been quoted in more salient terms. Such nonoptimal behavior is likely even more pronounced with everyday credit card usage as credit cost information is not typically readily available when consumers make purchasing decisions as it is in the experimental setting. The inability of an interest rate to effectively communicate the cost obligation of revolving credit can help explain other mistakes consumers make with credit cards. For example, recent papers by Ponce et al. (2017) and Gathergood et al. (2017) find that consumers lose money by consistently paying off multiple credit cards of varying price non-optimally.

Credit issuers can use revolving credit to take advantage of the consumer myopia that it produces. And indeed, I find that mail-order catalog retailers quickly adopt revolving credit, retire more salient installment credit, and price revolving credit plans in ways that are consistent with their operating in a shrouded equilibrium. These findings for historical retailer-issued credit are also relevant for the revolving credit instruments that are in use today, such as credit cards. As mentioned earlier, the conditions for a profitable shrouded equilibrium are more likely to be satisfied with credit cards than with retailer-issued credit. And indeed, evidence of the existence of a shrouded equilibrium in the credit card industry can be found in the extreme price stickiness

\[52\] Specifically, the condition for a binding transparent price floor is more likely to be satisfied for credit cards that retailer issued credit. For credit cards, an example of a possible transparent/salient price can be its annual fee or teaser rate.
of credit card interest rates throughout the 1980s\textsuperscript{53} as well as in innovations in deceptive pricing practices.\textsuperscript{54}

To counter the negative impacts of revolving credit on consumers, regulators need to increase the salience of credit card costs. However, this task is not easy. For example, the Truth-in-Lending Act of 1968 (TILA) mandated the disclosure of APR on all consumer credit. However, such a mandate should have minimal effects based on the findings in this paper that interest rates themselves are not salient. Indeed, as seen in Figures 8, 9, 10, and 11, there were generally no large downward movements in price of revolving credit plans in catalogs when the TILA went into effect.\textsuperscript{55} The 2009 Credit Card Accountability Responsibility and Disclosure (CARD) Act mandated the disclosure of total finance charges for a credit card holder’s outstanding balance if she only pays the minimum monthly requirement for the duration of the loan and if she takes 36 months to pay off the balance. The CARD act addresses revolving credit price salience issues more directly than TILA because consumers can more tangibly see how interest rate costs add up in two examples on their statement.\textsuperscript{56} However, consumers only see these CARD disclosures after they make purchasing decisions. A potentially more effective policy would mandate CARD-like disclosures in credit card solicitation materials or billing statements for a selection of sample balance or purchase amounts. Financial education can also be used to teach consumers the true cost obligation of revolving credit. In general, to mitigate

\textsuperscript{53} Credit card interest rates today are less sticky in comparison to their behavior in the 1980s. However, this does not necessarily imply that unshrouding has occurred and that credit card issuers are competing on price. The reduction of stickiness only occurred after a serious threat of a national credit card interest rate cap of 14\% APR passed the Senate in 1991 (Hyman, 2011). After this, credit card companies started to issue credit cards with variable interest rates, typically priced at some measure of the cost of funds (e.g., prime rate) plus a premium. Under variable interest rates, a shrouded equilibrium can exist as the premium used might not be competitive and could preserve profitability. In such a case, instead of being at a fixed level, the shrouded price ceiling in the theoretical model will simply be a function of cost of funds. As a note, variable-rate credit cards are generally exempt from the rate increase restrictions of the 2009 Credit Card Accountability Responsibility and Disclosure (CARD) Act. (Consumer Financial Protection Bureau, 2013).

\textsuperscript{54} HKM2016 list teaser rates and fees as examples of contract feature innovations that are potentially deceptive.

\textsuperscript{55} In fact, for smaller balances I see an increase in revolving credit costs at the time of TILA due to adoption of minimum interest fees and changes in the way monthly outstanding balances are calculated. Agarwal et al. (2015a) and Keys and Wang (2016) find that 36-month payment amount creates an anchor effect. Keys and Wang present evidence that some consumers who were paying their full balance end up paying the 36-month payment. Furthermore, this disclosure itself might be shrouded for credit card customers who pay their bills and view their credit card activity online. These customers 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.
overconsumption and encourage price competition, the most effective policy measures would need to increase salience of the cost of revolving credit before consumers make purchasing decisions and with tools other than interest rates.

References


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:

- Amazon Gift Card: Value: $12.50, Price: $10.00
- Amazon Gift Card: Value: $25.00, Price: $20.00
- Amazon Gift Card: Value: $37.00, Price: $30.00
- Amazon Gift Card: Value: $50.00, Price: $40.00
- Amazon Gift Card: Value: $62.50, Price: $50.00

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 Plan</th>
<th>Price of Gift Card</th>
<th>Service Fee</th>
<th>Starting Credit Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$5</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 starts in one month.

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

- Amazon Gift Card: Value: $12.50, Price: $10.00
- Amazon Gift Card: Value: $25.00, Price: $20.00
- Amazon Gift Card: Value: $37.00, Price: $30.00
- Amazon Gift Card: Value: $50.00, Price: $40.00
- Amazon Gift Card: Value: $62.50, Price: $50.00

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: Installment**

<table>
<thead>
<tr>
<th>Credit Plan</th>
<th>Service Fee</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td>$0.23</td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td>$0.78</td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td>$1.68</td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td>$2.94</td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td>$4.58</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.

**Panel B: Revolving – Base**

<table>
<thead>
<tr>
<th>Credit Plan</th>
<th>Service Fee</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td></td>
<td>$5</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. The CREDIT BALANCE in each subsequent month after the first month is calculated by first adding a service fee of 1.5% of the previous month’s credit balance to the previous month’s credit balance and then subtracting the monthly withdrawal amount (listed in the second column of the table above). If the summation of the previous month’s credit balance plus the service fee is smaller than the monthly withdrawal amount, then only the previous month’s credit balance plus the service fee will be withdrawn. The first withdrawal starts in one month.

**Panel C: Revolving – APR**

<table>
<thead>
<tr>
<th>Credit Plan</th>
<th>Service Fee</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td></td>
<td>$5</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. The CREDIT BALANCE in each subsequent month after the first month is calculated by first adding a service fee of 1.5% of the previous month’s credit balance to the previous month’s credit balance and then subtracting the monthly withdrawal amount (listed in the second column of the table above). If the summation of the previous month’s credit balance plus the service fee is smaller than the monthly withdrawal amount, then only the previous month’s credit balance plus the service fee will be withdrawn. The first withdrawal starts in one month.

**Panel D: Revolving – Unshrouded**

<table>
<thead>
<tr>
<th>Credit Plan</th>
<th>Service Fee</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$20.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$30.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$40.00</td>
<td></td>
<td>$5</td>
</tr>
<tr>
<td>$50.00</td>
<td></td>
<td>$5</td>
</tr>
</tbody>
</table>

*These payments will be automatically withdrawn from your income stream. The CREDIT BALANCE in each subsequent month after the first month is calculated by first adding a service fee of 1.5% of the previous month’s credit balance to the previous month’s credit balance and then subtracting the monthly withdrawal amount (listed in the second column of the table above). If the summation of the previous month’s credit balance plus the service fee is smaller than the monthly withdrawal amount, then only the previous month’s credit balance plus the service fee will be withdrawn. The first withdrawal starts in one month.
Figure 3
Calculation Question (Installment 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:
Figure 4
Calculation Question Results

Panel A: Calculation Responses

Note: The correct response 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 5

Panel A: Percent of Participants Who Use Credit

Panel B: Percent of Participants Who Make a Purchase

Panel C: Percent of Participants Who Use Credit

Panel D: Percent of Participants Who Make a Purchase
Figure 6
Intensive Margin

Panel A: Borrowed Amount per Borrower

Panel B: Purchased Amount per Purchaser
Figure 7
Examples of Credit Terms in Mail-Order Catalogs

Panel A: Installment Credit Terms

Panel B: Revolving Credit Terms

Figure 8
Internal Rate of Return for Borrowing $40

Panel A: Spiegel

Panel B: Aldens

Panel C: Sears

Panel D: Montgomery Ward

Panel E: J.C. Penney

Legend

Notes: Solid black line represents the rate on the 3-month Treasury bill.
Figure 9
Internal Rate of Return for Borrowing $100

Panel A: Spiegel
Panel B: Aldens
Panel C: Sears
Panel D: Montgomery Ward
Panel E: J.C. Penney

Legend
- Installment
- Revolving
- All Goods
- Durables

Notes: Solid black line represents the rate on the 3-month Treasury bill.
Figure 10
Internal Rate of Return for Borrowing $200

Panel A: Spiegel

Panel B: Aldens

Panel C: Sears

Panel D: Montgomery Ward

Panel E: J.C. Penney

Legend

Notes: Solid black line represents the rate on the 3-month Treasury bill.
Figure 11
Internal Rate of Return for Borrowing $300

Panel A: Spiegel

Panel B: Aldens

Panel C: Sears

Panel D: Montgomery Ward

Panel E: J.C. Penney

Legend

- Installment
- Revolving
- All Goods
- Durables

Notes: Solid black line represents the rate on the 3-month Treasury bill.
Appendix Table 1
Service Fees

<table>
<thead>
<tr>
<th>Price of Gift Card</th>
<th>Value of Gift Card</th>
<th>Installment Service Fee</th>
<th>Revolving Service Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) $10</td>
<td>(B) $12.50</td>
<td>(C) 0% MPR/0% APR</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(D) 1.5% MPR/18% APR</td>
<td>$0.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 3.5% MPR/42% APR</td>
<td>$1.94</td>
</tr>
<tr>
<td>(A) $20</td>
<td>(B) $25.00</td>
<td>(C) 0% MPR/0% APR</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(D) 1.5% MPR/18% APR</td>
<td>$1.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 3.5% MPR/42% APR</td>
<td>$4.27</td>
</tr>
<tr>
<td>(A) $30</td>
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</tr>
<tr>
<td></td>
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<td>(D) 1.5% MPR/18% APR</td>
<td>$2.94</td>
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<td></td>
<td>(E) 3.5% MPR/42% APR</td>
<td>$7.77</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(D) 1.5% MPR/18% APR</td>
<td>$1.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 3.5% MPR/42% APR</td>
<td>$7.77</td>
</tr>
<tr>
<td>(A) $50</td>
<td>(B) $62.50</td>
<td>(C) 0% MPR/0% APR</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(D) 1.5% MPR/18% APR</td>
<td>$4.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 3.5% MPR/42% APR</td>
<td>$12.63</td>
</tr>
</tbody>
</table>

Appendix Table 2
Dependent Variable: % of Respondents Who Use Credit

Panel A

<table>
<thead>
<tr>
<th></th>
<th>(1) Installment</th>
<th>(2) Revolving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% MPR/0% APR</td>
<td>0.16** (0.07)</td>
<td>0.24*** (0.04)</td>
</tr>
<tr>
<td>42% MPR/18% APR</td>
<td>−0.18*** (0.06)</td>
<td>−0.02 (0.04)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.37*** (0.05)</td>
<td>0.25*** (0.03)</td>
</tr>
</tbody>
</table>

N: 302 886

Note: Omitted category is 18% APR.

Panel B

<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>Revolving: All</td>
<td>−0.04 (0.06)</td>
<td>−0.12** (0.05)</td>
<td>0.05 (0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.53*** (0.05)</td>
<td>0.37*** (0.04)</td>
<td>0.19*** (0.04)</td>
</tr>
</tbody>
</table>

N: 388 404 396

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
### Appendix Table 3
Dependent Variable: % of Respondents Who Make a Purchase

#### Panel A

<table>
<thead>
<tr>
<th></th>
<th>(1) Installment</th>
<th>(2) Revolving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>−0.01 (0.06)</td>
<td>0.02 (0.04)</td>
</tr>
<tr>
<td>42%</td>
<td>−0.19*** (0.06)</td>
<td>−0.02 (0.04)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.79*** (0.04)</td>
<td>0.75*** (0.02)</td>
</tr>
</tbody>
</table>

N = 302 886

Note: Omitted category is 18% APR.

#### Panel B

<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>Revolving: All</td>
<td>−0.02 (0.05)</td>
<td>−0.05 (0.05)</td>
<td>0.12** (0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.79*** (0.04)</td>
<td>0.79*** (0.04)</td>
<td>0.60*** (0.04)</td>
</tr>
</tbody>
</table>

N = 388 404 396

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
## Appendix Table 4
Dependent Variable: % of Respondents Who Use Credit

### Panel A

<table>
<thead>
<tr>
<th></th>
<th>(1) Revolving: Base</th>
<th>(2) Revolving: APR</th>
<th>(3) Revolving: Unshrouded</th>
<th>(4) Installment</th>
</tr>
</thead>
<tbody>
<tr>
<td>APR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>0.25***</td>
<td>0.23***</td>
<td>0.24***</td>
<td>0.16**</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.07)</td>
</tr>
<tr>
<td>42%</td>
<td>-0.00</td>
<td>-0.04</td>
<td>-0.01</td>
<td>-0.18***</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.24***</td>
<td>0.23***</td>
<td>0.28***</td>
<td>0.37***</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
</tbody>
</table>

| N      | 295                | 297                | 294                       | 302             |

Note: Omitted category is 18% APR.

### Panel B

<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>APR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revolving: Base</td>
<td>-0.04</td>
<td>-0.13**</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Revolving: APR</td>
<td>-0.07</td>
<td>-0.14**</td>
<td>-0.00</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Revolving: Unshrouded</td>
<td>-0.01</td>
<td>-0.09</td>
<td>0.09^</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.53***</td>
<td>0.37***</td>
<td>0.19***</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
</tbody>
</table>

| N      | 388       | 404       | 396         |

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
### Appendix Table 5
Dependent Variable: % of Respondents Who Make a Purchase

<table>
<thead>
<tr>
<th></th>
<th>(1) Revolving: Base</th>
<th>(2) Revolving: APR</th>
<th>(3) Revolving: Unshrouded</th>
<th>(4) Installment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0.03</td>
<td>−0.04</td>
<td>0.07</td>
<td>−0.01</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>42%</td>
<td>−0.04</td>
<td>−0.02</td>
<td>−0.00</td>
<td>−0.19***</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.75***</td>
<td>0.78***</td>
<td>0.72***</td>
<td>0.79***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>N</td>
<td>295</td>
<td>297</td>
<td>294</td>
<td>302</td>
</tr>
</tbody>
</table>

Note: Omitted category is 18% APR.

### Panel B

<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>Revolving: Base</td>
<td>−0.01</td>
<td>−0.05</td>
<td>0.10*</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Revolving: APR</td>
<td>−0.04</td>
<td>−0.02</td>
<td>0.16**</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Revolving: Unshrouded</td>
<td>0.00</td>
<td>−0.08</td>
<td>0.11*</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.79***</td>
<td>0.79***</td>
<td>0.60***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>N</td>
<td>388</td>
<td>404</td>
<td>396</td>
</tr>
</tbody>
</table>

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
Appendix Table 6
Dependent Variable: Amount Borrowed per Borrowing Participant

Panel A

<table>
<thead>
<tr>
<th></th>
<th>(1) Installment</th>
<th>(2) Revolving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>3.20* (1.86)</td>
<td>0.07 (1.11)</td>
</tr>
<tr>
<td>42%</td>
<td>−2.50 (2.39)</td>
<td>−0.49 (1.30)</td>
</tr>
<tr>
<td>Constant</td>
<td>45.00*** (1.40)</td>
<td>47.11*** (0.90)</td>
</tr>
</tbody>
</table>

| N    | 108             | 289           |

Note: Omitted category is 18% APR.

Panel B

<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>Revolving: All</td>
<td>−1.03 (1.12)</td>
<td>2.11 (1.69)</td>
<td>4.12* (2.47)</td>
</tr>
<tr>
<td>Constant</td>
<td>48.20*** (0.97)</td>
<td>45.00*** (1.38)</td>
<td>42.50*** (2.17)</td>
</tr>
</tbody>
</table>

| N    | 195             | 114           | 88            |

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
### Appendix Table 7
Dependent Variable: Amount Purchased per Purchasing Participant

#### Panel A

<table>
<thead>
<tr>
<th></th>
<th>(1) Installment</th>
<th>(2) Revolving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>1.30</td>
<td>2.74**</td>
</tr>
<tr>
<td></td>
<td>(2.03)</td>
<td>(1.14)</td>
</tr>
<tr>
<td>42%</td>
<td>−1.41</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>(2.11)</td>
<td>(1.16)</td>
</tr>
<tr>
<td>Constant</td>
<td>42.35***</td>
<td>42.26***</td>
</tr>
<tr>
<td></td>
<td>(1.40)</td>
<td>(0.81)</td>
</tr>
</tbody>
</table>

| N      | 219             | 663           |

Note: Omitted category is 18% APR.

#### Panel B

<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>Revolving: All</td>
<td>1.35</td>
<td>−0.09</td>
<td>1.72</td>
</tr>
<tr>
<td></td>
<td>(1.41)</td>
<td>(1.65)</td>
<td>(1.91)</td>
</tr>
<tr>
<td>Constant</td>
<td>43.65***</td>
<td>42.35***</td>
<td>40.94***</td>
</tr>
<tr>
<td></td>
<td>(1.22)</td>
<td>(1.41)</td>
<td>(1.67)</td>
</tr>
</tbody>
</table>

| N      | 300          | 307          | 275          |

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01
Appendix Table 8
Time to Answer Calculation Question (in Minutes)

<table>
<thead>
<tr>
<th></th>
<th>(1) All Responses</th>
<th>(2) Answered Correctly</th>
<th>(3) Answered Incorrectly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revolving</td>
<td>0.85***</td>
<td>3.16***</td>
<td>0.42**</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
<td>(0.35)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.08***</td>
<td>1.10***</td>
<td>1.05***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.24)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>N</td>
<td>1188</td>
<td>326</td>
<td>862</td>
</tr>
</tbody>
</table>

Note: Omitted category is Installment.
Standard errors are in parenthesis. + p<0.15, * p<0.1, ** p<0.05, *** p<0.01

Appendix Table 9
U.S. Households Holding at Least One of the Specified Credit Cards in 1981

<table>
<thead>
<tr>
<th>Credit Card</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sears</td>
<td>57%</td>
</tr>
<tr>
<td>Visa</td>
<td>53%</td>
</tr>
<tr>
<td>MasterCard</td>
<td>47%</td>
</tr>
<tr>
<td>J.C. Penney</td>
<td>39%</td>
</tr>
<tr>
<td>Montgomery Ward</td>
<td>27%</td>
</tr>
<tr>
<td>Federated Dept. Stores</td>
<td>17%</td>
</tr>
<tr>
<td>American Express</td>
<td>11%</td>
</tr>
</tbody>
</table>

## Appendix Table 10
Total Interest Charges by Loan Amount from Spiegel Credit Plans

<table>
<thead>
<tr>
<th>Loan Amount</th>
<th>1958 Spring (Installment)</th>
<th>1959 Spring (Revolving)</th>
<th>1960 Fall (Revolving)</th>
<th>Minimum Monthly Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>$40</td>
<td>4.00</td>
<td>2.94</td>
<td>4.63</td>
<td>2.94</td>
</tr>
<tr>
<td>$100</td>
<td>10.00</td>
<td>10.22</td>
<td>11.31</td>
<td>15.93</td>
</tr>
<tr>
<td>$160</td>
<td>16.00</td>
<td>19.85</td>
<td>20.33</td>
<td>27.49</td>
</tr>
<tr>
<td>$200</td>
<td>21.00</td>
<td>26.79</td>
<td>27.55</td>
<td>35.31</td>
</tr>
<tr>
<td>$300</td>
<td>36.00</td>
<td>44.95</td>
<td>45.58</td>
<td>54.90</td>
</tr>
</tbody>
</table>

## Appendix Figure 1
Percentage of Participants who Make a Gift Card Purchase

![Panel A: Installment Credit (N=302)](image1)

![Panel B: Revolving Credit-All (N=886)](image2)
Appendix Figure 2
Holders of Consumer Credit Outstanding (excluding housing and automobile credit)

Source: Federal Reserve Bulletins.

Appendix Figure 3
Holders of Consumer Credit Outstanding

Source: Federal Reserve Bulletins.
Appendix Figure 4
Internal Rate of Return

Panel A: Most Expensive Credit Plan per Catalog for Borrowing $200

Panel B: Cheapest Credit Plan per Catalog for Borrowing $40
Appendix Figure 5
Cost of Debt

Panel A: Cost of Funds

Panel B: Interest Rate on Long-Term Debt

Source: Company Annual Reports.
Appendix Figure 6
First Monthly Payment for Borrowing $200

Panel A: Spiegel
Panel B: Aldens
Panel C: Sears
Panel D: Montgomery Ward
Panel E: J.C. Penney

Legend

Notes: Solid black line represents the rate on the 3-month Treasury bill.
Appendix Figure 7
Store Sales by Type

Panel A: Spiegel
Panel B: Aldens
Panel C: Sears
Panel D: Montgomery Ward
Panel E: J.C. Penney

Legend
- Total Sales
- Credit Sales
- Cash Sales
Appendix Figure 8
Number of Sears Credit Accounts from All Stores and Mail Order