Minimum Payment Warnings and Information Disclosure Effects on Consumer Debt Repayment Decisions

Linda Court Salisbury

Public policy makers encourage lenders to disclose loan cost information as a way of enabling borrowers to make more-informed debt repayment decisions. For example, current regulation requires credit card lenders to include a “minimum payment warning” on borrowers’ monthly statements, with the goal of encouraging borrowers to make larger monthly repayments each month and, consequently, decrease their debt levels. This research examines the effect of disclosing such information about future interest costs and time to pay off debt on consumers’ repayment decisions. The results indicate that disclosing information about the effects of repaying the minimum has little impact on repayment decisions. However, disclosing information about the effect of choosing an alternative course of action (i.e., a larger repayment amount) yielded a robust effect on repayment decisions. The findings suggest that cost information increases repayment amount for some borrowers, whereas time information may decrease repayment for others, especially those with little knowledge of interest compounding. This research provides some initial evidence of the impact of the CARD Act as well as that of similar regulations in Australia and Canada.

Keywords: consumer debt, information disclosure, credit cards, financial decision making, CARD Act

Managing personal debt is an ongoing challenge for many consumers. Total outstanding consumer credit totaled $2.84 trillion in June 2013, with $852 billion of that from revolving credit (Federal Reserve System 2013). The predominant form of revolving debt is unsecured credit card debt. The Federal Reserve’s 2009 Survey of Consumer Payment Choice estimated that 72% of U.S. consumers are credit card holders, with an average of 3.7 credit cards per person (Meijer et al. 2011). Average credit card debt per borrower was $4,679 in the first quarter of 2011 (TransUnion 2011). Managing that debt load can be difficult and expensive: U.S. consumers paid $94 billion in credit card interest in 2009 alone (Meijer et al. 2011).

While some credit card holders—those referred to as “transactors” or “convenience users”—repay their balance in full each month and avoid interest costs, a large portion incur interest costs each month when they repay less than the full balance due. Furthermore, the amount of interest these so-called revolvers repay is directly influenced by their repayment decision each month: larger repayments reduce future interest costs and time duration to pay off the loan, whereas relatively smaller repayments increase cost and time duration. Consequently, a key way to decrease consumers’ cost of debt—and also decrease lenders’ risk of borrower default—is to develop methods for influencing consumers’ monthly debt repayment decisions. The current research focuses on the approach of disclosing information to consumers about the impact of their repayment decisions on their interest costs and the time it would take them to repay the full loan balance.

Researchers have studied information disclosure extensively in domains such as health communications (e.g., Keller and Lehmann 2008), nutrition labeling (e.g., Kozup, Creyer, and Burton 2003; Wansink and Chandon 2006), and product warnings (e.g., Argo and Main 2004; Cox et al. 1997). Information disclosure for financial products has been examined as well, with a primary focus on its effects during product evaluation and choice (e.g., Kozup, Howlett and Pagano 2008). Yet the issue of disclosure at the time consumers make repayment decisions has received little attention in the information disclosure literature stream. This context is examined in the current research.

Typical lender practice is to require some minimum amount be repaid each month (e.g., 2% of the credit card balance), and minimum required payment information is disclosed on borrowers’ credit card statements each month. This practice lowers lenders’ risk of borrower default. The presence of minimum required payment information, however, has been associated with lower monthly credit card...
repayments than if the information were not present (Stewart 2009). This suggests that it might be beneficial to omit the minimum payment information from credit card statements; however, this would put borrowers at risk of unknowingly repaying less than the required minimum and, consequently, incurring penalty fees. Alternatively, disclosing additional information about interest cost and loan payoff time duration associated with repaying only the minimum offers an opportunity to mitigate the negative effects of minimum payment information. Navarro-Martinez et al. (2011) test such information with adult consumers and find no significant effects of supplemental information. However, Haws, Bearden, and Nenkov (2012) examine the effects of similar information with a student sample and find that the information increased repayment for those low in spending self-control.

This research examines how disclosing supplemental information to borrowers about the impact of repaying the minimum each month, together with similar information about repaying a larger amount, affects repayment decisions. Two experimental studies with adult U.S. consumers examine the impact of disclosing information about future interest costs and time to pay off debt on repayment decisions. The results indicate that disclosing information about the impact of repaying the minimum required amount each month has little influence on repayment decisions. However, disclosing cost and time information about the effect of choosing an alternative course of action (i.e., repaying an amount greater than the minimum) yielded a robust effect on repayment decisions. Consumers were much more likely to repay the alternative amount when it was disclosed to them. Furthermore, the nature of this shift in repayment depended on the type of information provided: the evidence suggests that cost information increases repayment amount for some borrowers, whereas time information may decrease repayment for others. The evidence also suggests that time information (but not cost information) has a more pronounced impact on consumers with many credit cards or those with less knowledge of interest compounding. This finding has important implications for regulatory policies and lender practices: simply informing borrowers about the relatively detrimental effects of repaying debt slowly (i.e., high cost and long duration) may do little to change behavior; instead, a “nudge” (Thaler and Sunstein 2008) in the form of highlighting an alternative repayment option is more likely to change repayment behavior. At the same time, policy makers and firms need to consider that calling attention to alternative repayment actions also comes with the risk that borrowers’ repayments could decrease if the salient alternative repayment is lower than what the consumer would have chosen to repay had no information been disclosed at all. This suggests that information disclosure is likely to be most effective when it can be tailored to different credit card customer segments.

CARD Act Minimum Payment Warning

The Credit Card Accountability and Responsibility Disclosure (CARD) Act of 2009 went into effect on February 22, 2010. The CARD Act amends the Truth in Lending Act (Federal Reserve System 2009) for unsecured credit card accounts. Among other things, the CARD Act prevents lenders from making unfair increases in interest rates and changes in terms, prohibits exorbitant and unnecessary fees, requires fair application and timing of card repayments, and provides enhanced disclosure of card terms and conditions. One type of enhanced disclosure the CARD Act requires is a “minimum payment warning” included on all monthly credit card statements. Figure 1 illustrates the format of the minimum payment warning. Policy makers in Australia (National Consumer Credit Protection Amendment [Home Loans and Credit Cards] Act 2011) and Canada (Lam 2009) have recently introduced similar credit card minimum payment warning disclosures.

The goal of the minimum payment warning is presumably to increase monthly repayment amounts for credit card holders who would otherwise repay the minimum required or other similarly small amounts. Survey data collected approximately one year after the regulation went into effect (n = 800; Synovate 2011) indicated that 70% of credit card holders reported noticing information about the interest cost and payoff time associated with repaying only the minimum amount; 48% reported noticing information about how much they should repay if they wanted to pay off the balance in three years. Of survey respondents, 30% who reported noticing the changes also reported altering their repayment or card usage behavior. This article examines the effect of similar information on repayment behavior at the individual consumer level.

Debt Repayment and Information Disclosure

Few studies have examined individual-level debt repayment behavior, although research in this area has begun to emerge with the advent of the CARD Act (e.g., Campbell, Gartenberg, and Tufano 2011; Navarro-Martinez et al. 2011). Prior research has suggested that credit card statement information about the minimum required payment amount acts as an anchor (Stewart 2009), and supplemental information about the associated payoff time duration and cost of repaying the minimum amount does not seem to counter that anchoring effect (Navarro-Martinez et al. 2011). Some evidence suggests, however, that supplemental information of this type increases repayment amount for consumers who are low in spending self-control (Haws, Bearden, and Nenkov 2012: Study 4).

A consumer facing the decision of how much to repay on his or her credit card each month must weigh the trade-offs between repaying a large amount in the current period (and thus reducing available funds for current spending in other areas) versus repaying a relatively smaller amount. Repaying less frees up currently available funds for other purposes but also increases future interest costs and loan payoff time duration. Consumers have difficulty understanding the cost of credit (e.g., Lee and Hogarth 1999) and interest compounding (Eisenstein and Hoch 2007; Stango and Zinman 2009), which can lead to undersaving (McKenzie and Liersch 2011) as well as repaying debt too slowly. Any information that increases the salience of trade-offs between current (repayment) costs versus future (interest) costs is likely to influence debt repayment decisions. For example, warning borrowers about the relatively high inter-
est cost and payoff time duration associated with repaying the minimum required amount makes the future consequences of their current decision more salient and may motivate them to repay a greater amount (Haws, Bearden, and Nenkov 2012).

Given consumers’ difficulty understanding interest compounding, it seems likely that simply disclosing the future impact of repaying the minimum required amount may not be enough information for them to accurately estimate the relative advantages of repaying an amount greater than the minimum. The limited evidence of its effectiveness suggests that this may be the case. One element of the CARD Act minimum payment warning is information about how much a borrower would need to repay each month to pay off the outstanding balance within three years (see Figure 1, Panel A). This additional information makes it easier for credit card holders to assess the cost and time trade-offs between repaying the minimum required amount versus a (specific) larger amount (Soll, Keeney, and Larrick 2013).

Research examining charitable donations has found that the appeals scale—the set of suggested donation amounts listed on solicitations—substantially alters the distribution of charitable donations received. Donations are “drawn” toward amounts included in the appeals scale versus other donation amounts (Desmet and Feinberg 2003). Research examining retirement planning has found that participants construed the default 401(k) option as an implicit recommendation by the employer and were thus more likely to choose it (McKenzie, Liersch, and Finkelstein 2006). Together, these findings suggest that the presence of three-year payoff information in the CARD Act minimum payment warning is likely to increase the proportion of borrowers choosing a repayment amount equal to the three-year amount. This is consistent with preliminary post–CARD Act transaction data from a Minnesota credit union indicating that an increased proportion of borrowers are repaying the three-year amount; however, those same borrowers also seemed to have increased their total debt relative to other borrowers (Campbell, Gartenberg, and Tufano 2011). Survey-based research with a nationally representative sample has found little evidence that revolving borrowers changed their behavior after the CARD Act was implemented; indeed, the total debt of revolvers rose (Jones, Loibl, and Tennyson 2012).

If the three-year amount serves as a “nudge” (Thaler and Sunstein 2008) for credit card holders, this could lead borrowers who might have repaid the minimum amount to repay more. At the same time, it is also plausible that con-

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**Figure 1. An Illustration of the CARD Act Minimum Payment Warning**

**A: Minimum Payment Warning**

Minimum Payment Warning: If you make only the minimum payment each period, you will pay more in interest and it will take you longer to pay off your balance. For example:

<table>
<thead>
<tr>
<th>If you make no additional charges using this card and each month you pay...</th>
<th>You will pay off the balance shown on this statement in about...</th>
<th>And you will end up paying an estimated total of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only the minimum payment</td>
<td>10 years</td>
<td>$3,284</td>
</tr>
<tr>
<td>$62</td>
<td>3 years</td>
<td>$2,232 (Savings=$1,052)</td>
</tr>
</tbody>
</table>

If you would like information about credit counseling services, call 1-800-xxxx-xxxx.

**B: Minimum Payment Warning When Minimum Required Amount Exceeds Three-Year Amount**

Minimum Payment Warning: If you make only the minimum payment each period, you will pay more in interest and it will take you longer to pay off your balance. For example:

<table>
<thead>
<tr>
<th>If you make no additional charges using this card and each month you pay...</th>
<th>You will pay off the balance shown on this statement in about...</th>
<th>And you will end up paying an estimated total of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only the minimum payment</td>
<td>14 months</td>
<td>$130</td>
</tr>
</tbody>
</table>

If you would like information about credit counseling services, call 1-800-xxxx-xxxx.

Notes: These figures were sourced from Federal Reserve System (2009).
consumers might reduce their repayment amount when the three-year payoff information is made salient to them. This has the potential to slow down repayment and increase total debt, as the preliminary post–CARD Act data suggest (Campbell, Gartenberg, and Tufano 2011; Jones, Loibl, and Tennyson 2012). First, if people indeed anchor on the minimum required payment amount, making an alternative repayment amount salient provides an alternative anchoring point (Mussweiler, Strack, and Pfeiffer 2000). Consumer repayments could be drawn upward or downward to the anchoring point. In addition, Soll, Keeney, and Larrick (2013) find that highly numerate consumers tend to overestimate the repayment amount required to pay off a loan in three years, whereas the opposite is true for those low in numeracy. However, when information resembling the minimum payment warning was presented, tendency to overestimate and underestimate were reduced drastically. To the extent that borrowers’ repayment choice is influenced by their understanding of payoff time duration versus repayment amount, presenting the three-year payoff information could lead some (underestimating) consumers to increase repayment while leading others (overestimating) consumers to decrease their repayment. In summary, prior research has suggested that disclosing information such as the minimum payment warning—and the three-year payoff information in particular—could have the intended consequence of increasing repayment for some consumers while simultaneously having the unintended consequence of decreasing repayment for others.

In their comprehensive review of product warning messages, Stewart and Martin (1994) note that warning messages can lead to unintended consequences, and the effects of warnings can vary across consumer groups. Subsequent research by Stewart and Martin (2004, p. 189) echoes this observation and expands on it further: “Unintended consequences of regulation are far more likely to be identified and addressed when the focus of information disclosure is on consumers’ understanding and use of information rather than on the form and content of the message. As information about products becomes more complex and requires greater qualification, disclosures will, out of necessity, become more complex. Such complexity increases the likelihood of unintended consequences.”

The goal of this research is not only to examine the overall effect of information similar to the CARD Act minimum payment warning on repayment but also to isolate the effects of cost information from the effects of time information and assess the contribution of each type of information to changes in repayment behavior. In doing so, three key research questions are examined in each of the following studies:

1. Will providing three-year information lead more consumers to choose to repay the three-year amount?
2. If more consumers repay the three-year amount, will this be due to (a) fewer consumers repaying below the three-year amount (i.e., repayments increasing) or (b) fewer consumers repaying above the three-year amount (i.e., repayments decreasing)?
3. Will information about future interest cost affect repayment behavior differently than information about the payoff time duration?

An overarching concern throughout is whether information disclosures such as the minimum payment warnings in the United States, Australia, and Canada could lead to unintended consequences for credit card borrowers.

**Study 1**

Study 1 was conducted to test whether disclosing information about the relationship between repayment amount and time duration necessary to pay off the loan affects repayment decisions. Two hundred five adult U.S. consumers participated in the study. Participants were recruited from an online survey panel and earned reward points for participating. The study design entailed a hypothetical credit card bill repayment scenario in which the information presented on the credit card statement varied across three experimental conditions. Participants were asked to decide how much of the credit card balance due to repay.

**Procedure**

All participants received the same instructions, in which they were told they would be making a hypothetical credit card repayment decision: “Imagine you have a credit card and you received your monthly credit card statement this morning. On the next screen, you will see the credit card statement, and you will be asked to make your payment. Please consider how much you can afford to pay, and treat your payment decision as you would in your everyday life.”

Participants were randomly assigned to one of three experimental conditions: (1) the control condition, which included the credit card balance due, the annualized percentage rate (APR), and the minimum required payment (MR) amount; (2) the MR time condition, which included the same information as the control condition plus information about how long it would take to pay off the full balance due if the minimum amount were repaid every month; and (3) the MR + 3YR time condition, which included all the information from the MR time condition plus additional information about how much a borrower would need to repay each month for the full balance due to be repaid in three years. Figure 2 illustrates the MR + 3YR time condition.

The quantities used in each of the experimental conditions were carefully chosen to align with values typical of U.S. credit card lenders at the time of the study and to avoid any “round” numbers, which might appear unusual or “unnatural” to participants (e.g., exactly $1,500.00, exactly $2,000.00). The balance due was set at $1,937.28 and APR was set at 14.0% because these figures closely matched the U.S. averages. Similarly, the minimum required payment amount was calculated as 2% of the balance due. The number of years to pay off the balance in the MR time condition was 19 years; this assumes that the minimum required payment each month equals 2% of the current balance due or $10, whichever is larger—a minimum required payment policy structure typical among credit card lenders. The monthly repayment amount required for a three-year payoff duration equaled $66.21, an amount calculated assuming the 14.0% APR, compounded monthly. After viewing the credit card statement and making a repayment decision, participants were asked a series of questions, described next.

**Measures**

Although the information manipulations were expected to affect repayment decisions, several individual characteris-
knowledge score, with values ranging from zero to three for each participant.

Some credit card holders ("convenience users") typically pay off their balance in full each month. It was important to measure the extent to which each participant had this predisposition because it would likely be a strong predictor of repayment behavior. Participants reported their tendency to pay off their own credit card in full each month using a seven-point Likert scale ("I always pay my credit card balance off in full each month"); 1 = "strongly disagree," and 7 = "strongly agree"). Participants also reported the extent to which they tended to repay only the minimum required amount each month for their own credit cards, using a seven-point Likert scale ("I often make only the minimum payment on my credit card bills"); 1 = "strongly disagree," and 7 = "strongly agree").

Finally, several demographic characteristics and credit card–related behaviors were measured. Participants reported their age, gender, income, education, how many credit cards they owned, and the current balance due (at the time) on their most frequently used credit card. Annual household income was measured with a 15-point scale (1 = "less than $20,000," and 15 = "$150,000 or greater"). Income was included as a covariate in the analysis to control for heterogeneity in "ability to repay" across the consumer sample.

Results

Consumer Sample and Summary Measures

The sample of 205 U.S. adult consumers comprised 49.5% men and 50.5% women, median age was 45–54 years, median education level was "some college or technical training beyond high school," and median income was $50,000–$59,999. Participants reported having an average of 3.38 credit cards and, at the time of the study, carried an average balance due of $1,835.06 on their most frequently used credit card. The percentage of participants with interest compounding knowledge levels {0, 1, 2, 3} were (13.7%, 30.9%, 29.9%, 25.5%), respectively. The average repayment amount was $672.14 for all participants and $184.89 for revolvers who did not repay the full balance; 27.8% of participants repaid the full balance due, and 5.9% of participants repaid the minimum required amount or less.

Average repayment was not significantly different across the three information conditions for all participants (MControl = $695.03, MMR time = $580.44, MMR + 3YR time = $742.29; \( \chi^2(2) = .016, p > .95 \)) nor was it significantly different for only those participants who chose to repay less than the full balance (MControl = $177.42, MMR time = $203.54, MMR + 3YR time = $170.79; \( \chi^2(2) = 1.736, p > .41 \)).

Analysis Approach

In the results that follow, the effect of each information type is assessed formally with a series of four logistic regression models. Three binary logit models are estimated with distinct dependent variables: (1) repaying the minimum required amount or less versus some larger amount, (2) repaying the full balance due versus some smaller amount, and (3) repaying $60–$70 versus some other amount. The repayment range, $60–$70, is examined
because $66.21 (the three-year amount) falls within that range, and it is very unlikely that consumers would choose an “odd” amount such as $66.21 if they had not been presented with information including that amount (and this is indeed true of the control and MR time conditions). Furthermore, personal experience with other repayment studies has shown that borrowers who repay neither the full amount nor the minimum required amount typically choose “round” numbers (multiples of five and ten dollars) for repayment. Thus, $60–$70 offers an appropriate range of repayment values for comparing effects across information conditions. Following the binary logit analyses, a multinomial logit model is estimated (described subsequently).

The presence or absence of each information type on the credit card statement is represented by 0–1 indicator variables: “MR time” refers to information about the payoff duration when the minimum required amount is repaid each month, and “3YR time” refers to information about the repayment amount ($66.21), which, when repaid every month, leads to a three-year payoff duration. Note that both indicator variables are coded as 1 in the MR + 3YR time condition, whereas only the MR time variable is coded as 1 in the MR time condition; both information variables are set equal to 0 in the control condition. In addition to the information covariates, several control variables are included in all the logistic models: CFC, knowledge of interest compounding, attitude toward debt, and household income. Furthermore, participants’ prior repayment behaviors, or habits, are accounted for with two covariates: (1) participants’ self-reported tendency to repay the full balance due is included as a covariate for the logit model predicting likelihood of repaying the full balance due, and (2) all other logit models, which are estimated only for “revolving” participants who repaid less than the full balance, include participants’ self-reported tendency to repay the minimum required amount each month for their own credit cards.

**Repayment Decision**

*Three-year amount.* Disclosing time duration information influenced how much participants chose to repay only in the MR + 3YR time condition, and the difference manifested in a very specific way. The distribution of repayments (for revolvers) in each condition, illustrated in Figure 3, shows a sharp increase in the proportion of $60–$70 repayments for participants in the MR + 3YR time condition. Participants were significantly more likely to choose a $60–$70 repayment amount in this condition, and the difference is striking: whereas 20.59% of all participants in the MR + 3YR time condition repaid $60–$70, only 4.41% of participants in the control condition and 1.45% of all participants in the MR time condition chose to do so. Pairwise comparisons indicated a significant difference between the MR + 3YR time condition and each of the other two conditions ($\chi^2(1)_{\text{Control, MR time}} = 1.060, p > .30; \chi^2(1)_{\text{Control, MR + 3YR time}} = 8.135, p < .01; \chi^2(1)_{\text{MR time, MR + 3YR time}} = 12.867, p < .001$).

A binary logit model was estimated (for revolvers) to assess the effects of information condition on the probability of choosing a repayment amount (nearly) equal to the three-year repayment amount disclosed in the MR + 3YR time condition (see Table 1, Model 1). As Table 1 shows, there was a strong positive, significant effect of 3YR time information on the probability of repaying $60–$70, but the same was not true of the MR time information. After accounting for the effects of information type, none of the other covariates had a significant effect. This indicates a clear and strong effect of the three-year information on repayment.

**Minimum required amount.** In contrast to the $60–$70 repayment range, the proportion of participants repaying the minimum required amount or less was similar across conditions (control: 5.88%, MR time: 7.25 %, MR + 3YR time: 4.41%); pairwise tests of proportions, as well as Fisher’s exact test, yielded no statistically significant differences between any of the three conditions. A binary logit model of the probability of repaying the minimum required amount or less was estimated (for revolvers). The results revealed that neither information type had a statistically significant effect on the probability of repaying the minimum amount or less (see Table 1, Model 2). The only statistically significant predictor of repaying the minimum amount was the positive effect of participants’ self-
reported tendency to repay the minimum required amount each month on their own credit cards.

**Full balance due amount.** The proportion of participants choosing to repay the full balance did not differ significantly across conditions (control: 29.4%, MR time: 21.74%, MR + 3YR: 32.35%; Fisher’s exact p > .34). A binary logit model of the probability of repaying the full balance was estimated for all participants (see Table 1, Model 3). The results indicated no statistically significant effects of either information type, but there was a large positive effect of self-reported tendency to always pay the full balance as well as a positive effect of household income. Thus, after controlling for individual differences, neither information type had a significant effect on the probability of repaying in full or of repaying only the minimum required.

**Distribution of repayments for revolvers.** Thus far, the results suggest that presenting three-year payoff information increases the probability of a $60–$70 repayment amount, but there was no evidence of a significant change in the probability of observing a repayment amount at the minimum required level or the full balance due level. However, if the probability of choosing $60–$70 repayment increases, then, by definition, some other repayment amount is less likely to be observed. Therefore, a multinomial logistic regression analysis was conducted to estimate, for revolvers repaying less than the full balance due, whether repayment amounts greater or less than the three-year amount had a decreased probability of being observed when 3YR time or MR time information was present. In other words, how does the presence of each information type affect the distribution of repayment among revolving participants?

Repayment amount was the dependent variable, recoded into three repayment categories {0–$59.99, $60–$70, $70.01–$1,936.99}.1 The repayment categories were defined to enable testing of whether any increase in the probability of choosing a $60–$70 repayment was accompanied by a relative decrease in repayment amounts greater or less than that amount.2 Table 2 summarizes the marginal effects of information type on the probability of each repayment category. Disclosing MR time did not significantly increase the probability of observing any particular repayment category; however, disclosing 3YR time information significantly increased the probability of a $60–$70 repayment and decreased the probability of a $70.01–$1,936.99 repayment. There was no significant effect of 3YR time on the probability of repaying below $60–$70. This suggests that although disclosing the three-year information increases the probability of repaying the three-year amount ($60–$70), it also decreases the proportion of repayments greater than the three-year amount for revolvers.

**Moderating effects of knowledge.** Although it is not the central focus of this research, one might ask whether the effect of 3YR time information on repayment may be stronger or weaker for certain consumer groups, especially for more vulnerable groups such as those lower in knowledge or

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### Table 1. Study 1: Parameter Estimates for Three Binary Logit Models

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Model 1: Repay Three-Year Amount ($60–$70)</th>
<th>Model 2: Repay Minimum Amount or Less</th>
<th>Model 3: Repay Full Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (SE)</td>
<td>Coefficient (SE)</td>
<td>Coefficient (SE)</td>
</tr>
<tr>
<td>MR time</td>
<td>–1.400 (.1198)</td>
<td>–.243 (.861)</td>
<td>–256 (.619)</td>
</tr>
<tr>
<td>3YR time</td>
<td>2.877 (1.089)**</td>
<td>–.940 (.922)</td>
<td>.356 (.611)</td>
</tr>
<tr>
<td>Often pay minimum</td>
<td>.157 (.165)</td>
<td>.633 (.204)**</td>
<td>–1.263 (.277)**</td>
</tr>
<tr>
<td>Always pay in full</td>
<td>–</td>
<td>.234 (.500)</td>
<td>.009 (.402)</td>
</tr>
<tr>
<td>CFC</td>
<td>.083 (.422)</td>
<td>.005 (.398)</td>
<td>.262 (.311)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>–.492 (.341)</td>
<td>–1.066 (.607)</td>
<td>.186 (.440)</td>
</tr>
<tr>
<td>Attitude toward debt</td>
<td>–.066 (.473)</td>
<td>–.077 (.139)</td>
<td>.208 (.070)**</td>
</tr>
<tr>
<td>Income</td>
<td>–.088 (.108)</td>
<td>–2.321 (3.252)</td>
<td>–10.620 (3.182)</td>
</tr>
<tr>
<td>Constant</td>
<td>–2.032 (2.584)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood ratio $\chi^2(7)$</td>
<td>22.48**</td>
<td>16.19*</td>
<td>93.29***</td>
</tr>
</tbody>
</table>

*p < .05.
**p < .01.
***p < .001.

Notes: Models 1 and 2 include only those participants who chose to repay less than the full balance (i.e., the revolvers). Model 3 includes all participants.

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1A repayment of $1,937.00 or more was considered a repayment of the full balance, which was $1,937.28.

2Although an ordinal logistic regression might typically be run for this type of data to test for directional changes in repayment choices, this is not the focal intent of the analysis. The goal of the analysis instead is to examine how consumers redistribute their repayment choices across these categories. Thus, the repayment categories are treated as nominal rather than ordinal.
income. The sample size and relatively few observations of repayment at the three-year amount prohibit comprehensively testing for moderating effects in the models reported thus far, so a binary logistic model was estimated with “repaid greater than $70” as the dependent variable, providing a test of whether the effect of time information on the probability of repaying greater than the three-year amount differs across consumer groups. Model covariates included those previously described as well as two-way interactions between the information variables and these covariates: attitude toward debt, CFC, knowledge of interest compounding, education, income, tendency to repay the minimum required each month, and number of credit cards held.

The results indicated some evidence of moderating effects: there was a significant interaction effect between MR time and knowledge of interest compounding ($p < .05$) and a marginally significant interaction effect between 3YR time and knowledge ($p < .08$). A spotlight analysis revealed that presenting MR time information increased the probability of repaying more than the three-year amount (between $70.01$ and $1,936.99$), but only for those consumers with very low knowledge of interest compounding ($p < .04$). There were no significant effects of MR time detected for consumers with knowledge scores greater than zero. The spotlight analysis results indicated that 3YR time information significantly decreased the probability of repaying more than the three-year amount, but only for those consumers with very low knowledge ($p < .02$) or low knowledge ($p < .02$); the effects were nonsignificant for higher levels of knowledge. No other consumer characteristics moderated the effects of time information on repayment.

**Results Summary**

Consumers’ repayment decisions are influenced by the information available to them at the time they decide. The results from this study suggest that disclosing the payoff time duration associated with repaying the minimum every month does not have a statistically significant effect on repayment amount for the vast majority of consumers. The moderation analysis offered suggestive evidence that consumers with very low knowledge of interest compounding (14% of this consumer sample) have an increased probability of repaying more than the three-year amount when MR time is present.

In contrast, disclosing the three-year repayment information exerted a strong influence on repayment: participants were significantly more likely to choose to repay $60–$70 when the three-year payoff information was present on the credit card statement. Furthermore, the multinomial logit analysis indicated that presenting the three-year information decreased the probability of (revolving) participants repaying an amount greater than the three-year amount. The distribution of repayments in Figure 3 suggests a similar conclusion, and the moderation analysis suggests that low-knowledge consumers may be more vulnerable to this (unintended) effect of three-year information on repayment. Finally, there was no evidence that either information type changed the probability of repaying the minimum amount or the full balance due.

This study provides initial evidence that warning consumers about the negative consequence of repaying only the minimum required amount each month (i.e., full balance repayment will take a very long time) may not change repayment behavior for most consumers. However, presenting information about an alternative choice—the three-year repayment amount—was effective at changing behavior. At the same time, some evidence suggests that the three-year payoff information may have the unintended effect of decreasing repayment for some consumers. A limitation of this study is that it only tested the effect of disclosing information about payoff time duration. Another important consequence of the rate of loan repayment is the impact it has on total interest cost: lower repayment leads to higher future interest costs. Study 2 tests the effect of disclosing interest cost as well as time duration on repayment decisions.

**Study 2**

Study 1 revealed that disclosing the time duration needed to pay off the balance due affected repayment in a very specific way: warning participants that paying the minimum required each month would result in a very long time duration (19 years) was ineffective at changing behavior; however, presenting an alternative repayment amount ($66.21$) that would decrease time duration dramatically to only three years led to a sharp increase in the likelihood that people repaid $60–$70. The goal of Study 2 is to test whether disclosing the future total interest cost associated with a person’s repayment decision affects repayment behavior. To this end, both total interest cost and time duration information are tested and compared.

Study 2 used a between-subjects experimental design that varied the information disclosed to participants in a hypothetical monthly credit card repayment scenario similar to Study 1. In this study, however, the format and content of the supplemental information disclosed was designed to
align more closely with the minimum payment warning currently mandated by the CARD Act (see Figure 1). An important difference between the experimental information manipulations and the CARD Act information is that the manipulations were designed to avoid any potential information bias against repaying the minimum required amount. A more detailed description of the information manipulations is discussed next with the experimental procedure.

Procedure and Measures

Four hundred sixty-two adult consumers, recruited from an online survey panel, were randomly assigned to one of seven experimental conditions; they followed the same basic procedure as that of Study 1. Participants saw the same instructions, followed by a credit card statement containing information that varied across seven conditions: (1) the control condition, which included the credit card balance due, the APR, and the minimum required payment amount; (2) the MR time condition, which included the control condition information plus information about how long it would take to pay off the full balance due if the minimum required amount were repaid every month; (3) the MR cost condition, which included the control condition information plus the total interest cost incurred if the minimum required amount were repaid every month until the balance was fully paid off; (4) the MR time and cost condition, which included the information from both the MR time and MR cost conditions; (5) the MR + 3YR time condition, which included all the information from the MR time condition plus additional information about how much a borrower would need to repay each month for the full balance due to be repaid in three years; (6) the MR + 3YR cost condition, which included information from the MR cost condition as well as the total interest cost paid if the borrower repaid a larger amount (the same amount as presented in the 3YR time condition) every month; and (7) the MR + 3YR time and cost condition, which included all information from both the MR + 3YR time and MR + 3YR cost conditions.

Figure 4 illustrates the credit card statement used in the MR + 3YR time and cost condition. The supplemental information is displayed in a tabular format, consistent with the format required by the CARD Act (as illustrated in Figure 1, Panel A). The information content is also very similar, with four important changes aimed at reducing potential bias or misunderstanding about the information content. First, the time and cost column titles were altered slightly to improve clarity and ensure that participants understood what each quantity represented. Second, “only the minimum payment” was replaced by the potentially less-biased phrase “the minimum required amount.” Third, no three-year cost savings information was included (as in Figure 1, Panel A) so that only the cost amount varied across conditions. Finally, the “Minimum Payment Warning” statement illustrated in Figure 1 is absent from the experimental stimuli to reduce potential information bias.

All participants saw the same account balance due of $1,937.28, minimum payment of $38.74, and APR of 14%, mimicking the values used in Study 1. All other quantities were calculated using the same interest compounding and minimum payment policy structure assumptions as in Study 1. Again, given this balance due and APR, the monthly repayment amount required to repay the full balance in three years is $66.21. The total interest cost incurred if participants repay only the minimum required each month is calculated as $2,159.20, and the time duration is 19.3 years. If participants were to repay $66.21 every month for three years, the total interest cost would be $446.37. To summarize, the time and cost information values corresponding to repaying the minimum required are 19.3 years and $2,159.20; the values corresponding to repaying $66.21 are 3 years and $446.37. This information illustrates for participants that a relatively small change in repayment amount has the potential to greatly decrease total interest cost and time duration for repaying the outstanding debt.

Finally, measures identical to those from Study 1 were collected after the repayment decision task: CFC (Cronbach’s $a = .79$), attitude toward debt (Cronbach’s $a = .71$), knowledge of interest compounding, tendency to make the minimum payment each month, tendency to repay the full balance each month, and several demographic and credit card–related behavior measures.

Results

Consumer Sample and Summary Measures

Four hundred sixty-two U.S. consumers (43.5% men, and 56.5% women) participated in the study. Median age was 35–44 years, median education level was “some college or technical training beyond high school,” and median income was $50,000–$59,999. Participants reported having, on average, 3.11 credit cards and, at the time of the study, carried an average balance due of $2,121.12 on their most fre-
quenty used card. Levels of knowledge about interest compounding spanned relatively evenly across the sample: the percentage of participants displaying knowledge levels \{0, 1, 2, 3\} were \{22.3\%, 29.7\%, 23.1\%, 24.9\\%\}, respectively. Twenty-seven percent of participants repaid the full balance. Average repayment amount was $631.49 across all participants; for those who did not repay the full balance, average repayment amount was $127.99. Nine percent of participants repaid the minimum required amount or less.

Table 3 summarizes repayment decisions across the seven information conditions. There were no statistically significant differences in mean repayment between the seven conditions for all participants (Kruskal–Wallis $\chi^2(6) = 9.309, p > .15$) or for those participants who repaid less than the full balance (i.e., the revolvers; $\chi^2(6) = 4.192, p > .65$).

**Analysis Approach**

Analyses in this study align with Study 1’s approach. The effect of information type was assessed formally with a series of logistic models whose covariates included four 0–1 indicator variables representing each of four information types: “MR time” and “3YR time” are defined as in Study 1, “MR cost” represents the presence or absence of information about the total interest cost incurred if the minimum required is repaid every month, and “3YR cost” represents the presence or absence of information about the total interest cost incurred if the three-year amount ($66.21$) is repaid every month. The covariates in all series of logistic models whose covariates included four effect of information type was assessed formally with a term. This term was also omitted from the multinomial logit model (described subsequently) for the same reason.

**Repayment Decision**

*Three-year amount.* Figure 5 illustrates the distribution of repayments for each information condition. Panel A compares the conditions with time information alone (MR time and MR + 3YR time) with the control condition, Panel B compares the conditions with cost only (MR cost and MR + 3YR cost) with the control condition, and Panel C compares conditions that include both time and cost information (MR time and cost and MR + 3YR time and cost). Consistent with Study 1, the three-year information conditions displayed a pronounced increase in the percentage of participants that chose to repay $60–$70. The proportion of participants repaying $60–$70 was significantly greater and quite large when three-year information was present: 22.45\% of participants paid $60–$70 when 3YR time and/or 3YR cost information were present, whereas 1.01\% did so when only MR time and/or MR cost were present ($\chi^2(1) = 43.902, p < .001$; see Table 3). The proportion repaying $60–$70 was also significantly different across all seven conditions (Fisher’s exact $p < .001$).

A binary logit model of the probability of choosing a $60–$70 repayment amount was estimated for revolvers, with information covariates MR time, MR cost, 3YR time, 3YR cost, and 3YR time x 3YR cost (see Model 1 in Table 4). Model results indicated large, statistically significant, positive effects of 3YR time and 3YR cost information on the probability of repaying $60–$70 (see Table 4). They were accompanied by a significant, negative 3YR time x 3YR cost interaction effect. Adding the three effects together yields a statistically significant, positive effect of presenting both 3YR time and 3YR cost together ($\chi^2(1) = 8.34, p < .004$). There were no significant effects of MR time information or MR cost information. The effects of all other covariates were nonsignificant as well. Thus, as in Study 1, the results show a clear and strong positive effect

### Table 3. Study 2: Repayment Summary Measures by Information Condition

<table>
<thead>
<tr>
<th>Information Condition</th>
<th>N</th>
<th>Mean Repayment: All Participants (SD)</th>
<th>Mean Repayment: Revolvers (SD)</th>
<th>Percentage Repaying Minimum Amount or Less</th>
<th>Percentage Repaying Three-Year Amount ($60–$70)</th>
<th>Percentage Repaying Full Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control(^a)</td>
<td>68</td>
<td>$637.37 (817.84)</td>
<td>$169.40 (265.31)</td>
<td>8.82%</td>
<td>0%</td>
<td>26.47%</td>
</tr>
<tr>
<td>MR time</td>
<td>68</td>
<td>$610.34 (798.97)</td>
<td>$167.24 (233.02)</td>
<td>10.29%</td>
<td>1.47%</td>
<td>25.00%</td>
</tr>
<tr>
<td>MR cost</td>
<td>66</td>
<td>$438.73 (806.30)</td>
<td>$128.62 (216.22)</td>
<td>19.70%</td>
<td>1.52%</td>
<td>15.15%</td>
</tr>
<tr>
<td>MR time and cost</td>
<td>64</td>
<td>$640.12 (997.27)</td>
<td>$113.14 (163.22)</td>
<td>15.63%</td>
<td>0%</td>
<td>25.00%</td>
</tr>
<tr>
<td>MR + 3YR time</td>
<td>66</td>
<td>$635.96 (858.14)</td>
<td>$100.41 (136.12)</td>
<td>6.06%</td>
<td>19.70%</td>
<td>28.79%</td>
</tr>
<tr>
<td>MR + 3YR cost</td>
<td>64</td>
<td>$742.12 (960.24)</td>
<td>$108.23 (153.76)</td>
<td>3.13%</td>
<td>26.56%</td>
<td>32.81%</td>
</tr>
<tr>
<td>MR + 3YR time and cost</td>
<td>66</td>
<td>$719.88 (887.82)</td>
<td>$99.64 (91.83)</td>
<td>1.52%</td>
<td>21.21%</td>
<td>31.63%</td>
</tr>
<tr>
<td>All MR conditions</td>
<td>198</td>
<td>$562.76 (870.37)</td>
<td>$136.53 (207.27)</td>
<td>15.15%</td>
<td>1.01%</td>
<td>21.72%</td>
</tr>
<tr>
<td>All 3YR conditions</td>
<td>196</td>
<td>$698.89 (899.01)</td>
<td>$102.67 (128.90)</td>
<td>3.57%</td>
<td>22.45%</td>
<td>31.63%</td>
</tr>
</tbody>
</table>

\(^a\)The control condition included balance due, APR, and minimum required payment information.
Figure 5. Study 2: Percent Distribution of Repayment (Revolvers Only)

A: Time Duration Information

B: Total Interest Cost Information

C: Both Time Duration and Total Interest Cost Information
Minimum required amount. In contrast, the proportion of participants repaying the minimum required amount was significantly less for the conditions with three-year information (3.57%) than for those conditions with only MR time and/or MR cost information (15.15%; \( \chi^2(1) = 15.523, p < .001 \)). Furthermore, the proportion of participants repaying the minimum required amount was significantly different across the seven information conditions (Fisher’s exact \( p > .24 \)). A binary logit model of the probability of repaying the full balance (Table 4, Model 3) showed that, after controlling for individual difference variables, there were no statistically significant effects of information type. Information interaction effects were similarly nonsignificant. Participants’ self-reported tendency to always repay the balance in full had a significant, positive effect, as did knowledge of interest compounding and household income.

Distribution of repayments for revolvers. Finally, a multinomial logit model was estimated for revolving participants, with repayment amount recoded into the same repayment categories used in Study 1 ($0–$59.99, $60–$70, $70.01–$1,936.99). Table 5 shows the marginal effects of disclosing each information type. The marginal effects of MR time information and MR cost information were all nonsignificant. However, the marginal effects of three-year information displayed a notable pattern of results: the probability of repaying an amount greater than $60–$70 significantly decreased when 3YR time information was present (vs. absent), the probability of a $60–$70 payment increased significantly when 3YR cost was present, and the probability of a repayment greater than $70 was not significantly different.

### Table 4. Study 2: Parameter Estimates for Three Binary Logit Models

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Model 1 Repay Three-Year Amount ($60–$70)</th>
<th>Model 2 Repay Minimum or Less</th>
<th>Model 3 Repay Full Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR time</td>
<td>.087 (1.424)</td>
<td>-.190 (.825)</td>
<td>-.529 (.593)</td>
</tr>
<tr>
<td>MR cost</td>
<td>-.071 (1.425)</td>
<td>1.039 (.712)</td>
<td>.929 (.624)</td>
</tr>
<tr>
<td>3YR time</td>
<td>3.505 (1.271)**</td>
<td>-.302 (.876)</td>
<td>-.421 (.658)</td>
</tr>
<tr>
<td>3YR cost</td>
<td>4.249 (1.274)**</td>
<td>-1.921 (.868)*</td>
<td>.141 (.649)</td>
</tr>
<tr>
<td>MR time ( \times) MR cost(^a)</td>
<td>-</td>
<td>-.286 (1.044)</td>
<td>1.163 (.912)</td>
</tr>
<tr>
<td>3YR time ( \times) 3YR cost(^a)</td>
<td>-4.040 (1.374)**</td>
<td>-.420 (1.690)</td>
<td>-.724 (1.073)</td>
</tr>
<tr>
<td>Often pay minimum</td>
<td>-.019 (.096)</td>
<td>.386 (.107)**</td>
<td>.927 (.112)**</td>
</tr>
<tr>
<td>Always pay in full</td>
<td>-</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>CFC</td>
<td>.207 (.274)</td>
<td>-.330 (.334)</td>
<td>.269 (.236)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-.043 (.185)</td>
<td>-.451 (2.09)*</td>
<td>.528 (.157)**</td>
</tr>
<tr>
<td>Attitude toward debt</td>
<td>.054 (.242)</td>
<td>.615 (.262)*</td>
<td>.285 (.229)</td>
</tr>
<tr>
<td>Income</td>
<td>-.041 (.051)</td>
<td>-.081 (.068)</td>
<td>.122 (.044)</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.275 (2.109)*</td>
<td>-2.786 (2.096)</td>
<td>-9.320 (1.744)**</td>
</tr>
<tr>
<td>Likelihood ratio ( \chi^2(11))(^b)</td>
<td>73.66**</td>
<td>53.99***</td>
<td>210.19***</td>
</tr>
</tbody>
</table>

\(^a\) Model 1 does not include the MR time \( \times\) MR cost interaction because it did not converge with that covariate; zero participants repaid $60–$70 in the MR time and cost condition.

\(^b\) Model 1’s chi-square has 10 degrees of freedom because it has one covariate fewer than Models 2 and 3.
more likely to repay less than the three-year amount when MR time was present with eight or more credit cards were

time affects repayment for participants who report holding

$60–$70 as the dependent variable, showed a significant inter-

A second binary logistic model, with “repaid greater than $70” as the dependent variable, showed a significant inter-

Overall, the results suggest a shift in repayment prob-

Moderating effects of number of credit cards held. Two

Individual differences also influenced the relative distri-

Notes: Marginal effects are calculated at covariate mean values, with the following exceptions: the marginal effect of 3YR time is calculated at MR time = 1, the marginal effect of 3YR cost is calculated at MR cost = 1, and the marginal effect of 3YR time × 3YR cost is calculated at MR time = 1 and MR cost = 1. For the (0–1) information covariates, effect sizes represent absolute changes in repayment probability.

Results Summary

The results revealed effects of information disclosure that
were consistent with those found in Study 1. Cost informa-
tion associated with repaying the minimum required amount (MR cost) did not have a statistically significant effect on repayment amount in any of the estimated mod-

ers. Similar nonsignificant results were found for MR time as well; however, the moderation analyses suggest that MR time affects repayment for participants who report holding eight or more credit cards. This small portion of participants (7% of the sample) was less likely to repay less than the three-year amount and more likely to repay greater than the 3YR amount when MR time was present. The repayment choices of all other participants (i.e., the vast majority) were not significantly affected by the presence of MR time information.

<table>
<thead>
<tr>
<th>Covariate</th>
<th>$0–$59 (SE)</th>
<th>$60–$70 (SE)</th>
<th>$71–$1,937 (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR time</td>
<td>-.071 (.091)</td>
<td>.007 (.083)</td>
<td>.065 (.095)</td>
</tr>
<tr>
<td>MR cost</td>
<td>.055 (.090)</td>
<td>-.006 (.086)</td>
<td>-.049 (.096)</td>
</tr>
<tr>
<td>3YR time</td>
<td>-.051 (.125)</td>
<td>.432 (.158)**</td>
<td>-.382 (.140)**</td>
</tr>
<tr>
<td>3YR cost</td>
<td>-.376 (.099)**</td>
<td>.572 (.152)**</td>
<td>-.196 (.137)</td>
</tr>
<tr>
<td>3YR time × 3YR cost*a</td>
<td>.018 (.204)</td>
<td>-.106 (.103)</td>
<td>.089 (.207)</td>
</tr>
<tr>
<td>Often pay minimum</td>
<td>.102 (.021)**</td>
<td>.001 (.006)</td>
<td>-.103 (.020)**</td>
</tr>
<tr>
<td>CFC</td>
<td>-.152 (.053)**</td>
<td>.014 (.017)</td>
<td>.138 (.053)*</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-.051 (.033)</td>
<td>-.002 (.011)</td>
<td>.053 (.032)</td>
</tr>
<tr>
<td>Attitude toward debt</td>
<td>-.010 (.043)</td>
<td>.004 (.014)</td>
<td>.006 (.044)</td>
</tr>
<tr>
<td>Income</td>
<td>-.015 (.010)</td>
<td>-.002 (.003)</td>
<td>.018 (.010)</td>
</tr>
</tbody>
</table>

*aThe MR time × MR cost interaction term was not included in this model because of model convergence difficulty, likely because no participants in the MR time and cost condition chose to repay $60–$70.

Individual differences also influenced the relative distribution of repayments: tendency to repay the minimum amount had a significant positive effect on the probability of repaying less than $60–$70 and a significant negative effect on repaying greater than $70, whereas CFC had a significant negative effect on the probability of repaying less than $60–$70 but a significant positive effect on the probability of repaying greater than $70.

Overall, the results suggest a shift in repayment probabilities toward the three-year repayment amount. The probability of repaying $60–$70 increased when three-year information was present. This was accompanied by a decrease in the probability of repaying amounts less than the three-year amount if 3YR cost information was present; in contrast, it was accompanied by a decrease in the probability of repaying amounts greater than the three-year amount when 3YR time was present.

The results revealed effects of information disclosure that were consistent with those found in Study 1. Cost information associated with repaying the minimum required amount (MR cost) did not have a statistically significant effect on repayment amount in any of the estimated models. Similar nonsignificant results were found for MR time as well; however, the moderation analyses suggest that MR time affects repayment for participants who report holding eight or more credit cards. This small portion of participants (7% of the sample) was less likely to repay less than the three-year amount and more likely to repay greater than the 3YR amount when MR time was present. The repayment choices of all other participants (i.e., the vast majority) were not significantly affected by the presence of MR time information.
Presenting three-year information about time, cost, or both had a strong positive effect on participants’ likelihood of repaying $60–$70. The 3YR cost information had a negative effect on the probability of repaying the minimum required amount or less; the same was not true of 3YR time. Furthermore, the multinomial logit analysis suggested that the probability of choosing a repayment amount less than $60–$70 decreased when 3YR cost information was present. In contrast, the probability of choosing a repayment amount greater than $60–$70 decreased when 3YR time information was present. Moderation analyses suggest that for consumers with six or more credit cards (16% of the sample), 3YR time increased the probability of repaying less than the three-year amount. Finally, none of the information types had a significant effect on the probability of repaying the full balance, after controlling for individual difference variables.

**Discussion and Conclusion**

Consumer debt repayment decisions, particularly for flexible-term loans, have a direct impact on the total cost of a loan as well as the time to pay off the loan. Minimum payment warnings aim to encourage consumers to pay down their credit card debt faster by making larger repayments each month. The evidence presented here suggests that disclosing the negative impact of repaying only the minimum required amount each month (i.e., high interest cost and long payoff time duration) does not lead to changes in repayment behavior for the vast majority of consumers. However, there is some limited evidence indicating that consumers very low in knowledge or those holding a large number of credit cards may have an increased probability of repaying more than the three-year amount when minimum payment time information is present. There was no such evidence for minimum payment cost information.

Most notably, if minimum payment information is accompanied by additional information about an alternative course of action (i.e., repaying the three-year amount), repayment behavior changed consistently across the studies: consumers are significantly more likely to repay an amount (nearly) equal to the three-year amount when that information is present. Study 2 suggests that the three-year information about interest cost has the intended consequence of increasing repayments by decreasing the likelihood of repaying the minimum required amount and other repayment amounts less than the three-year amount. However, the evidence from both Studies 1 and 2 suggests an unintended consequence of disclosing three-year time information—that is, the probability of repayments greater than the three-year amount decreases when it is present. This creates a potential “backfire effect” in the sense that disclosing the three-year time information may slow repayment and increase interest cost for some credit card holders who might have otherwise repaid a larger amount. Furthermore, moderation analyses indicate that this unintended consequence of three-year time information may be more pronounced for consumers with low knowledge of interest compounding.

**Implications for Public Policy**

This research has important implications for public policy. First, it provides some initial evidence of the impact of the CARD Act, as well as Australia’s National Consumer Credit Protection Amendment Act and Canada’s credit card reform, on consumer repayment behavior. All three countries now require lenders to include minimum payment warnings on credit card statements. Australia’s minimum payment warning includes two-year information, whereas Canada’s regulations include only a warning about repaying the minimum amount (no alternative amount, such as the CARD Act’s three-year information, is required). The mostly nonsignificant effects of MR time and MR cost are particularly concerning for the Canadian regulators because their minimum payment warnings are restricted to that type of information. Additional empirical research is needed to estimate the effects of the two-year information required in Australia’s minimum payment warning as compared with the three-year information effects examined here.

Second, the results suggest that information disclosure of this type, whose objective is to reduce consumer debt levels, may achieve its objectives for some consumers (in this case, those who have been repaying the minimum required amount) but not for others (i.e., those who may have repaid more than the three-year amount). Thus, it is imperative that public policy makers test the impact of proposed future regulation on consumer behavior before it is enacted rather than limiting testing to concerns such as information format design, consumer comprehension, and consumer information format preferences (e.g., Hogarth and Merry 2010; see a similar suggestion in Sunstein 2010). The results reported here also point to the importance of assessing the risk of unintended consequences for particular customer groups, such as those low in financial knowledge or those holding a large number of debt accounts. Furthermore, public policy makers should consider segmentation approaches to regulation that enable lenders to tailor information disclosure by customer segment. For example, in the case of credit card statement information disclosure, the information disclosed by lenders could be contingent on repayment behavior in prior months or on the number of credit cards held by a borrower. Some credit card lenders already have similar capabilities, such as Chase’s Blueprint service, which offers customers individually tailored repayment plans, including associated supplemental information on credit card statements.

Third, the finding that knowledge of interest compounding moderates time information effects on repayment has specific implications for financial literacy education. This specific type of financial knowledge can be readily incorporated into financial education programs and decision aids such as online loan calculators or mobile apps. In addition, the moderating effects of number of credit cards on time information highlight the need for financial literacy educators and debt counseling professionals to help consumers manage repayment decisions across many debt accounts.

Fourth, it is important to note that a consumer who repays the three-year amount listed on his or her credit card statement every month (and does not make any other purchases with the card) will not repay the credit card balance within three years. The three-year cost and time duration information is (unintentionally) deceptive: it is calculated assuming that the consumer repays the exact same dollar amount each month (e.g., $66.21 every month for 36 months, in the scenarios used in this research). However,
the three-year amount is recalculated each month, and assuming that a consumer makes no purchases in the future (as does the minimum payment warning), the three-year amount on the credit card statement will decrease each month as the balance shrinks. For the credit card scenario in Studies 1 and 2, the three-year amount would be $66.21 in month one, $64.69 in month two, $63.21 in month three, and so on; the net result is that a consumer repaying the three-year amount displayed each month will instead take ten years to pay off the full credit card balance. This is not only a point of confusion for the consumer but also a potential source of harm to consumers who believe their actions will result in a three-year payoff duration when they will not.

Potential Limitations and Further Research

A potential limitation of this research is that supplemental information was displayed on the hypothetical credit card statement in such a manner that it would be highly unlikely for participants not to notice the information. Recent evidence has suggested that some consumers have not noticed the new minimum payment warning on their credit card statements (Synovate 2011), so any changes to repayment behavior detected in this research are conditional on the consumer noticing the information in the first place. A second limitation is that consumers’ debt repayment decision behavior was examined in a hypothetical repayment context. An important next step is to test these effects using real-world credit card statement transaction data, comparing repayment behavior before and after the CARD Act regulations went into effect or, more pointedly, partnering with lenders and conducting field tests that vary the minimum payment warning information disclosed to examine its effects on actual credit card holder decisions.

The evidence reported here suggests that disclosing the three-year information may lead some consumers (who would have otherwise repaid more) to decrease their repayment amount to the three-year amount, especially consumers who have difficulty understanding interest compounding and its impact on total debt. Further research is needed to verify whether this is a robust empirical phenomenon, to further test the differences among vulnerable consumer groups, and to examine what circumstances would lead a consumer to repay less when the three-year amount is present. Possible explanations, among others, include a simple anchoring effect, a potential self-control lapse induced by exposure to the three-year amount, or perhaps a realization that one has overestimated the repayment amount necessary to pay off the outstanding balance within three years. Gaining a better understanding of the underlying mechanisms driving behavior will not only further the field’s theoretical understanding of repayment behavior but also offer insights that enable public policy makers to shape changes to future regulation.

References


Credit Card Accountability Responsibility and Disclosure Act (2009), S.414, 111th Congress.


