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Labovitz School of Business & Economics, University of Minnesota Duluth, 11 E. Superior Street, Suite 210, Duluth, MN 55802

Exploring the Payday Effect: Anxiety Before Payday Leads to Overspending

Laura Goodyear, University of Toronto, Canada

Chuck Howard, Texas A&M University, USA

Marcel Lukas, University of St Andrews

Avni Shah, University of Toronto, Canada

While standard economic theory suggests that individuals spending should not change in response to regular income, research shows that individuals spend more following a payday. Using both real transaction data and experiments, this work demonstrates that anxiety leads individuals to construe their income as a windfall leading to overspending.

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Exploring the Payday Effect: Anxiety Before Payday Leads to Overspending

Laura Goodyear, University of Toronto, Canada
Chuck Howard, Texas A&M University, USA
Marcel Lukas, University of St. Andrews, Scotland
Avni Shah, University of Toronto, Canada

EXTENDED ABSTRACT

The standard theory in economics posits that an individual's consumption should not change in response to predictable income, like a salary paycheck (Carroll 1997; Deaton 1991; Hall 1978). However, researchers have continued to document a "payday effect" whereby they consistently find that individuals spend more immediately following receipt of predictable income (Olafsson and Pagel 2018; Parker 1999; Souleles 1999). While these studies provide evidence that there appears to be a consistent effect of income receipt on consumer spending, the findings regarding why this effect occurs are inconclusive. Some research suggests that this effect seems to be present for consumers who are financially illiquid (Kaplan and Violante

2014). However, others suggest that the payday effect occurs even for those with substantial liquid assets (Olafsson and Pagel 2018). A natural question emerges: Why are consumers deviating from standard economic theory (e.g. Hall 1978) and failing to smooth consumption on paydays?

To gain greater insight into the underlying mechanism of the payday effect, we used real income and spending data ($N=67,360$) provided by a popular financial application in the United Kingdom, Money Dashboard, to examine whether certain groups were more prone to this effect. The structure of the data allows us to observe the timing and amount of each user's paychecks and discretionary spending from January 2013 to December 2018 before individuals began using the budgeting application, as well as demographic information for each user. Our analysis follows the conventions set by Gelman et al. (2014) for investigating payday effects with big data. First, to measure the payday effect we perform panel regression analysis for which the econometric specification is:

$$Y_{ict} = \sum_{k=-7}^7 \beta_{kc} I_i(\text{Paid}_{t-k}) + X'_{it} + \varepsilon_{it} \quad (\text{Eq. 1})$$

Where Y_{ict} is the spending ratio of user i on day k in category c , Paid is a dummy equal to 1 if the user receives a pay cheque on day t , and X'_{it} is a vector of control variables. We compared the coefficients generated by Equation 1 using between-subject t-tests to determine if the size of the effect differs between groups (e.g., men and women). All consumers in our sample display significantly greater spending compared to their average spending across product types, however, we find that this effect is significantly larger amongst women ($=0.15, =0.08; p < .001$), younger¹ consumers ($=0.13, =0.08; p < .001$), and lower-income² consumers ($=0.23, =0.05; p < .001$). This heterogeneity could be due to many potential sources. In particular, it could be argued that these groups experience greater financial constraint. However, past research has also indicated that anxiety is higher amongst these groups (Armstrong and Khawaja 2002; Misowsky and Ross 1999; Lindemann 1996). Therefore, could anxiety, above and beyond financial constraint, prior to payday lead individuals to be more prone to the payday effect?

In order to determine whether anxiety or financial constraint, as proposed by past research, could be driving the payday effect, we conducted three experiments. In Experiment 1 ($N=246$), to induce anxiety, we manipulated financial constraint, which is associated with experiencing anxiety (e.g. Hayhoe et al. 2012). This manipulation allowed us to determine if the payday effect is simply due to experiences of financial constraint or heightened anxious feelings. In a highly detailed hypothetical scenario, all participants read about events during a two-week period of their life where prior to their paycheck they experienced a sudden negative shock, a \$50 parking ticket. Participants were randomly assigned to one of two experimental conditions that manipulated financial constraint. Participants in the constrained condition were told they had to cut back on their average daily spending prior to payday after a negative financial shock. Participants in the unconstrained condition were told they did not have to make any changes to their average daily spending prior to their payday after the negative financial shock. Following this, all participants were told they had received their paycheck. We tested payday spending by asking participants to order a meal, a drink and a main course at a restaurant, the day after receiving their paycheck. We found that though experiencing financial constraint increased anxiety ($M_{\text{Constrained}}=4.61, M_{\text{Unconstrained}}=3.39; p < .01$), it did not produce significant differences in the total cost of participants meal choices ($p > .1$). However, higher anxiety was significantly related to larger amounts spent at the restaurant ($\beta = 1.48, p = .02$).

In Experiment 2 ($N=701$), we examined why anxiety might lead to increased spending. Past research has indicated that anxiety leads individuals to construe money differently, like overestimate the physical size of money (Zaleskiewicz et al. 2013). Similar to Experiment 1, we presented participants with a hypothetical scenario about a typical week in their life. To ensure that participants did not experience any undue financial constraint, all participants were told that they had \$500 in their checking account a week prior to receiving their paycheck. To determine if anxiety leads to changes in the way individuals construe their income, consistent with past research, we asked participants to indicate their current level of anxiety and how much their paycheck feels like a "bonus" on a 7-point scale. To determine if individual's construe their income differently, we conducted a regression analysis controlling for participants average level of anxiety. We found that those with higher anxiety reported that their income felt more like a bonus ($\beta = 0.22, p < .001$).

While the first two experiments provide initial support for our proposition that anxiety drives payday spending, in Experiment 3 ($N=293$), we test the full model. Specifically, we examined if construing income as a windfall explains the relationship between anxiety and increased spending on payday. Using the same manipulation as Experiment 1, in Experiment 3 we asked participants to indicate their preference for a cheap versus expensive restaurant following receipt of their income. Specifically, participants were asked to rate their preference between two restaurants; one where the average dinner was in the \$10-30 price range versus one where the average was in the \$25-45 range on a 7-point scale (Scale: 1=Definitely restaurant 1 to 7=Definitely restaurant 2). The restaurant choices were counterbalanced to ensure there were no order effects. We again find that experiencing financial constraint increased anxiety ($M_{\text{Constrained}}=4.89,$

1 For age we use a median split to identify younger versus older consumers (Median age = 31)

2 For income we use a median split to identify low income versus high income (Median income = £1,758)

$M_{\text{Unconstrained}}=3.32; p < .01$). However, experiencing financial constraint did not produce significant differences in restaurant preference ($p > .1$). Consistent with our anxiety account, we first find that experiencing higher anxiety is significantly associated with a preference for the more expensive restaurant ($\beta = 0.21, p = .001$) and construing income as a bonus mediated this effect (95% CI = [0.05, 0.17]). To examine the entire model, we conducted a path analysis. We found that the hypothesized model fit the data well (CFI=0.99; GFI=0.98; AGIF=0.94; RMSEA = 0.049; SRMR=0.44). Specifically, we found that financial constraint lead to significantly higher levels of anxiety ($p < .001$), experiencing higher levels of anxiety was significantly related to construing income as a windfall ($p < .001$), and construing income as a windfall was significantly related to preferring the more expensive option ($p < .05$).

Collectively, our experiments shed light on the mechanism underlying previous findings regarding the payday effect. Mainly, we find that there is anxiety associated with financial constraint, which drives the payday effect for lower income individuals rather than financial constraint alone. Thus, if anxiety is driving the payday effect than we should expect to see a reduction in the payday spending for groups that typically experience greater anxiety when uncertainty is reduced.

To examine if a budgeting application could reduce an individual's uncertainty, we conducted a pilot study ($N=99$). Specifically, we wanted to understand what the purpose of a budgeting application is and why individuals used or would use a budgeting application. We asked participants to indicate their level of agreement with a number of statements regarding the purpose of a budgeting application (Scale: 1=Strongly disagree to 7=Strongly agree). We find that individuals believe that a budgeting application restores a sense of control ($M=5.75$), reduces uncertainty ($M=5.54$), and reduces anxiety ($M=4.84$). However, we also found that individuals did not believe that a budgeting application would make decisions for them ($M=3.10$). As such, using the same econometric specification in Equation 1 we examined the difference in payday spending prior to consumers using the Money Dashboard application and after they began using the application, conditional upon them logging into the application at least once. Consistent with our prediction, we find that those who are most likely to experience greater anxiety display the greatest proportional reduction in the payday effect after using the budgeting application.

In sum, these results demonstrate that experiencing anxiety prior to receiving a paycheck can lead individuals to increase the amount they are willing to spend. Further, we find that higher levels of anxiety lead individuals to think of their predictable income like a windfall, which facilitates spending. We also provide evidence that reducing uncertainty leads individuals, especially those who are most likely to experience anxiety, to reduce their payday spending consistent with our anxiety explanation. These results begin to provide some understanding for many individuals who are in a vicious cycle of living paycheck to paycheck, over and above just financial constraint alone. In addition, this work begins to provide some insight into practical interventions that can be used to curb overspending behaviors on payday.

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