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Abstract

This paper presents new survey evidence on workers' response to the 2011 payroll tax cuts. While workers intended to spend 10 to 18 percent of their tax-cut income, they reported actually spending 28 to 43 percent of the funds. This is higher than estimates from studies of recent tax cuts, and arguably a consequence of the design of the 2011 tax cuts. The shift to greater consumption than intended is largely unexplained by present-bias or unanticipated shocks, and is likely a consequence of mental accounting. We also use data from a complementary survey to understand the heterogeneous tax-cut response.

Key words: tax cuts, consumption, liquidity constraints, mental accounts, permanent-income hypothesis, present-bias

1 Introduction

One of the most common tools used by policy makers over the past half century to battle sluggish demand during recessions has been cutting taxes. This usually takes the form of either a tax rebate, or a reduction in tax rates. Policy makers rely on households to then spend these extra funds in the short term to boost aggregate spending, and help bump the economy out of a recession. The most recent example of this was the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, signed into law on December 17th, 2010. Among other measures, the act reduced the payroll taxes (social security and Medicare) withheld from workers' paychecks from 6.2% to 4.2% for all of 2011. This tax cut affected nearly 155 million workers in the US totaling to an increase of around $112 billion in 2011 paychecks. For an average household earning $50,000 per year, this meant an additional receipt of $1,000 per year (which would show up as an additional $42 in the worker's paycheck twice a month). In December of 2011, the tax cuts were extended for the first two months of 2012, and then on February 22, 2012, the tax cuts were extended for the rest of the 2012 calendar year.[1]

Theoretically, the response to a temporary increase in income should be small: Under the life-cycle/permanent income hypothesis, individuals should increase their spending by at most the annuitized value of the stimulus. In fact, Ricardian equivalence implies no spending response, since individuals should anticipate higher future taxes to offset the tax cut. However, empirically, individuals may spend a non-trivial proportion of the extra income because of, for example, present-biased preferences or liquidity constraints (Browing and Lusardi, 1996). This paper presents survey evidence on workers' response to the 2011 payroll tax cuts.

For this purpose, we designed novel survey questions that directly elicit respondents' marginal propensity of tax cut usage. These questions were included as part of an online survey, administered to the RAND Corporation's American Life Panel (ALP). Workers were surveyed at two points in time: in early-2011, around the time the tax cut was first enacted, and then in mid-December 2011, close to the expiration of the initial tax cuts. The first survey asked respondents how they intended to spend the extra funds from the payroll tax cut in their paychecks, while the second survey inquired about actual usage of the funds.

We find that when households were asked what they intended to do with their tax cut funds, very few – 12 percent – report intending to mostly spend the funds. The average *intended* marginal propensity to consume (MPC) is 13.7 percent. However, data from the second survey reveal that many more respondents – 35 percent – report having spent most of the funds. In fact, the average *actual* MPC is 35.9 percent. Our estimates are inconsistent with both the

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[1]There was much debate over the efficacy of these tax cuts, with proponents of the cuts claiming that the extra funds in workers' paychecks would be used to boost the economy out of a recession, and opponents claiming that the cuts were wasted federal dollars that would only increase the deficit. This heated debate in Washington fueled the staggered extension of the tax cuts, yielding a high level of uncertainty around how long the cuts would be in place.

canonical life-cycle/permanent income theory and with Ricardian equivalence, since they would either imply a small spending response (equivalent to the annuity value of the stimulus) or no response to the extra income. Our estimated actual MPC is at the higher end of the range found in studies that examine consumer response to relatively recent tax rebates. This would suggest that perhaps, as policy-makers had originally hypothesized when determining the design of the tax cut,[2] the mechanism through which the tax cut was implemented – as a change in the withholding rate instead of a one-time lump-sum rebate – led consumers to spend a greater proportion of the extra income.

There is substantial demographic heterogeneity in how the extra funds from the tax cuts were used. A simple liquidity constraints story would suggest that the tax cuts would provide much needed spending money to those who are more liquidity constrained. Therefore, the conventional wisdom is that the MPC should be higher for low-income and low-education groups, since they tend to be more liquidity constrained (Jappelli, 1990). In fact, the Obama Administration's own website touts the greater effects of cutting the tax rates of low income households, and quotes the Congressional Budget Office (CBO) in suggesting that tax policies that target low-income households tend to have higher stimulating effects to the economy.[3] Our findings contradict this commonly held view: We do not find evidence of low-income respondents spending a greater proportion of the extra funds. In fact, high-income workers use the largest share of the tax cut funds for consumption, while low-income workers use most of them to pay down debt. In addition, using a companion survey, we find that groups that are generally identified as being liquidity constrained are more heavily indebted than their counterparts, and also expect binding liquidity constraints in the future. In this context, the heterogeneous response is not inconsistent with the permanent income hypothesis, since it predicts that a liquidity-constrained individual would exhibit a higher MPC than an unconstrained individual, but only if the constrained individual expects those constraints to not tighten further in the future.

While intended usage of the tax cut funds is predictive of actual usage of the funds, across all demographic groups, we observe a systematic shift towards spending for those who do not use their funds in the way they had intended to. We find that 51.7 percent of those who had intended to mostly save the funds, and 18.7 percent of those who had intended to use them for mostly paying debt in fact end up mostly spending them (and 71 percent of those who intended to spend the funds in fact do so). This systematic shift towards consumption could be explained by time-inconsistent preferences that are not perceived by the respondent (Thaler and Shefrin, 1981; Laibson, 1997; O'Donoghue and Rabin, 1999). We test this hypothesis by using an individual-

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[2]Implementing the 2011 tax cuts by changing the withholding rate (as opposed to sending out rebate checks) was a conscious decision by the administration; according to Jason Furman, the deputy director of the National Economic Council, the administration believed that changing the withholdings was a more effective form of stimulus than sending out rebate checks (Cooper, 2010).

[3]See (accessed on December 24, 2012): http://www.whitehouse.gov/the-press-office/2010/12/10/tax-relief-unemployment-insurance-reauthorization-and-job-creation-act-2

specific measure of whether the respondent is present-biased (obtained from an incentivized task), and by using financial literacy of the respondent as a proxy of her sophistication (that is, her awareness of the present-bias). Our analysis indicates that self-control problems do not explain the systematic shift towards greater consumption. Another possibility for this systematic shift is a positive aggregate shock that affects the different demographic groups similarly, which would then cause them to spend more of the extra funds than they had intended to. By using unanticipated changes in individuals' year-ahead earnings, and exploiting state-level variation in changes in macroeconomic conditions over the course of 2011 (relative to their trends during 2010) as proxies for individual-level shocks, we find some support for this hypothesis. However, our analysis suggests that our measures of individual-level shocks explain at most 20 percent of the shift towards increased consumption. In light of this, we propose mental accounting as the primary explanation for the incongruity that we observe between intended and actual behavior. We hypothesize that the systematic shift towards spending more than intended is a consequence of respondents using different mental accounts when reporting their intended and actual usage (Thaler, 1990, 1992). More specifically, when reporting her intended MPC at the beginning of the year, a respondent may focus on the annual stimulus, and treat this non-trivial amount as an increment to her asset account, and hence report a low intended MPC. However, when receiving incremental boosts to her paycheck spread out over the course of the year, she may decide the actual tax cut usage based on the small gain, which would mentally be treated as current income, and lead to a higher MPC. This finding underscores the need to make a distinction between intended and actual usage of tax cut funds when using survey methods to investigate consumers' response to (disaggregated) tax cuts.

The most common use of the additional funds in our sample is paying down debt— 40 percent of the funds are, on average, used for debt servicing. This finding is consistent with survey approaches that examine consumers' response to recent tax rebates (Shapiro and Slemrod, 2003a, 2009). From the consumers' perspective, this may be optimal considering the large debt issues leading up to and during the financial crisis (Brown et al., 2010). Consumers may eventually spend the resulting increase in savings, and this may lead to a higher MPC over a longer horizon.[4] But that is unlikely to boost aggregate demand in the short-term and is of little relevance in determining the efficacy of fiscal stimuli. Moreover, given the high indebtedness of U.S. households and a greater urgency to rebuild their balance sheets following tightening credit conditions and binding liquidity constraints (Chakrabarti et al., 2011; Mian, Sufi, and Rao, 2012), households are less likely to spend any future cash injections from tax cuts. The

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[4]There is mixed evidence with regards to the long-term response of those who do not spend the extra income. Survey evidence in Shapiro and Slemrod (2003a; 2009) indicates that the overwhelming majority of those who reported not spending the tax rebate intended the resulting increase in savings (which may manifest itself as an increase in assets or decrease in debt) to last at least a year. However, Agarwal, Liu, and Souleles (2007) find that credit card balances of those individuals who pay off debt in the short-term in response to the 2001 tax rebates are back at their pre-rebate levels within nine months.

uniqueness of the current economic climate also suggests that policy-makers should be cautious in extrapolating the results from this study for future policies, and at the same time, be careful in using past studies to deduce the impact of current fiscal policies.

There is a large strand of research studying the response of consumption to changes in income (see the review article by Jappelli and Pistaferri, 2010). Our paper is related to the literature that investigates the effects of predictable changes in household income, particularly those caused by tax policy, on consumption (see Shapiro and Slemrod (2003a) and Parker et al. (2011) for reviews). We build on the related literature in a number of ways. One, to our knowledge, this study is the first empirical examination of consumers' response to the 2011 payroll tax cuts. Second, we design a new survey question that directly elicits the marginal propensity of tax cut usage from the respondent (as opposed to asking the respondent for their most likely usage, as has been done in prior survey research; see Shapiro and Slemrod, 1995; 2003a). This methodological innovation provides us with more information, and does not require imposing assumptions to translate the most-likely uses to an estimate of the marginal propensity. Moreover, our resulting estimates are reasonable when compared with previous estimates, and paint a sensible picture of demographic heterogeneity. This suggests that respondents are in fact able to understand this novel question and provide answers without much difficulty. Third, using rich survey data, we are able to convincingly explain the patterns of demographic heterogeneity in tax cut usage. Fourth (and perhaps most importantly), the panel design of the study allows us to directly compare intended and actual usage of the extra income, and to investigate the reasons for why the two may not correspond. Fifth, data on time-inconsistent preferences, besides allowing us to test why intended and actual behavioral response to tax cuts may be different, enables us to distinguish the role of self-control problems from liquidity constraints in explaining the response heterogeneity. Previous literature has acknowledged the possibility of a systematic correlation of self-control problems with liquidity constraints, but has not attempted to distinguish the two because of data limitations (Gross and Souleles, 2002; Mian and Sufi, 2011). We find that groups with liquidity constraints – younger and low-income respondents – are more likely to have time-inconsistent preferences (i.e., have greater self-control problems). However, even after controlling for their self-control problems, we continue to find that (current and future perceived) liquidity constraints are an important determinant of tax cut usage.

This paper is structured as follows. Section 2 briefly reviews the related literature, and theories for why the design of tax cuts may matter. The data are described in Section 3, and the main empirical results are presented in Section 4. Section 5 discusses the results and presents additional analysis to interpret the findings. Finally, Section 6 concludes.

2 Background

This section briefly reviews the related literature and possible theories for why the design of the tax cut may matter.

2.1 Related Literature

Here we briefly describe the findings from studies that examine the spending responses to either tax rebates implemented in the last decade, or to tax rebates/cuts that have a design similar to that of the 2011 payroll tax cuts.

Micro-data based studies of consumer response to tax rebates have used two general approaches. The first uses micro data on households to infer their spending response to tax rebates indirectly. For example, Johnson, Parker, and Souleles (2006) use the Consumer Expenditure Survey (CE) to measure the impact of the Economic Growth and Tax Relief Reconciliation Act of 2001 – which sent $300 or $600 to most U.S. households in July-September 2001 – on consumer spending. They collect data on the timing and amount of the rebate by adding questions to a module of the CE, and find that the marginal propensity of consumption (MPC) on non-durables is between 20 and 40 percent, that is, households increase their consumption on non-durables by 20-40 percent of the rebate amount during the 3-month period in which the rebate is received.[5] Notably, they find little effect on consumption changes for durables.

In the same vein of using micro datasets, Agarwal, Liu, and Souleles (2007) use individual-level credit card data to estimate the response of credit-card payments, spending, and debt to the 2001 tax rebates. As in Johnson et al. (2006), they exploit the random timing of the rebate mailing, and find that households initially use the rebates to pay down debt. But the debt levels stay lower for three months only, and return close to their pre-rebate levels within nine months.

Using the same data source (CE) and an identification strategy similar to that of Johnson et al. (2006), Parker et al. (2010) study the effect of the Economic Stimulus Act (ESA) of 2008 – which sent stimulus payments of $300 to $1,200 to individuals depending on their family composition – on consumption. During the first 3-month period in which the rebate is received, they estimate an MPC of 12-31 percent. However, contrary to the 2001 tax rebates, they find (1) a smaller (and statistically less precise) effect on consumption in the subsequent 3 month period, and (2) find a significant effect of the rebate on consumption of durables. Including durables, they estimate that 50-90 percent of the rebate is spent.

The second approach, which is methodologically closer to the one adopted in the current study, uses survey responses to directly estimate the consumption response to tax rebates. This

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[5] They also find evidence of an additional lagged effect on spending, beyond the immediate 3-month period: they estimate an MPC of 69 percent for the cumulative effect over the quarter of receipt and the subsequent three-month period, but the estimate is not very precise.

line of research, pioneered by Matthew Shapiro and Joel Slemrod, directly asks respondents about what they did (or plan to do) with the extra funds from the tax rebates. For example, Shapiro and Slemrod (2003a), using questions added to the Michigan Survey of Consumers, find that only 22 percent of rebate recipients report that they will mostly spend the 2001 tax cuts; under certain assumptions, they calculate that this equals an MPC of about one-third, which is similar to the estimate obtained by Johnson et al. (2006) for the concurrent response to these tax rebates. For the 2008 rebates, Shapiro and Slemrod (2009) find that about 20 percent of recipients report they will spend the rebate, with nearly half saying they will use the stimulus payments to pay debt. This again translates into an MPC of about one-third, which makes the estimate in line with that obtained by Parker et al. (2011).

The tax cut that we investigate in this paper manifests itself as a change in the withholding rate. A few studies have investigated consumption responses to changes in withholding rates. Shapiro and Slemrod (1995), using a survey approach, find that 43 percent of consumers think they will mostly consume the extra cash from the change in the income tax withholding rate in 1992 (which increased after-tax income by about $29 per month per worker for all of 1991). Parker (1999) uses the CE to investigate changes in consumption when take-home pay increases in months after wage-earners hit the earnings ceiling for Social Security payroll taxes. He estimates an MPC for nondurables of about 50 percent in a three-month contemporaneous period in which the income increase is realized. Another study that examines the spending response to changes in the withholding rate is Souleles (2002), who investigates the Reagan tax cuts. Under the Reagan Economic Recovery Tax Act, enacted in 1981, the withholding rate decreased by 5 percent in October 1981, 10 percent in July 1982, and a final 10 percent in July 1983. Using the CE, Souleles (2002) estimates an MPC for nondurables of around 60-90 percent for the last two changes in the withholding rates, which were pre-announced; the standard errors on the estimates are fairly large though.

Two relatively recent studies that examine the spending response to changes in the withholding rate are Coronado, Luptopn, and Sheiner (2005) and Sahm, Shapiro, and Slemrod (2012). Both elicit the use of the extra funds from the withholding rate change directly from consumers. The former investigate the spending response to the Jobs and Growth Reconciliation Act, enacted in 2003, which reduced most marginal tax rates above 15 percent by at least 2 percentage points, and was implemented as a change in the withholding rate. They find that 20.7 percent of the respondents reported mostly spending the increase in pay resulting from the reduction in the withholding. The second study, Sahm et al. (2012), examines the intended spending response to the Making Work Pay tax credit, enacted in 2009, which reduced the income tax withholding for workers for two years. The credit, implemented as a reduction in the amount of taxes withheld from regular paychecks, was between $400 and $800 per year. The authors find that only 13 percent of respondents reported that they would mostly spend the 2009 tax credit.

It is worth discussing whether survey questions that directly elicit the marginal propensity of tax funds usage accurately measure the actual behavior of households. The review of the literature above shows that direct survey methods yield contemporaneous marginal propensities of consumption similar to those obtained from the indirect approach of inferring them from self-reported consumption data (for the 2001 and 2008 tax rebates), indicating that the two types of survey data provide consistent and comparable information. In addition, Parker et al. (2011) added a Shapiro-Slemrod style question to the 2008 Consumer Expenditure Survey, and find that responses to survey questions are strongly correlated with the reported consumption behavior of households. For example, they find that those who report mostly spending the 2008 stimulus payments in fact spent 75 cents more per dollar than those who said they mostly saved the payments. Moreover, as we describe below, our estimated actual MPC is reasonable when compared to estimates in the literature (obtained using different methods) and the demographic heterogeneity that we find is sensible. All these pieces of evidence make us fairly confident that the survey responses do in fact contain useful information.

2.2 Does the design of the tax cut matter?

In a standard economic model with rational consumers, how the tax cut is implemented (for example, as a change in the withholding rate or a one-time transfer) is not relevant since different types of income are fungible. However, outside the model, it might matter if, for example, individuals use mental accounts, or if the delivery mechanism affects awareness of the tax cut which in turn affects their use.

Thaler (1990; 1992) argues that individuals have different mental accounts for wealth: small gains (relative to income) would be treated as current income and largely spent, while larger positive shocks would be treated as wealth and enter the asset account, and would be less likely to be spent. The mental account framework would then suggest that, compared to one-time payments, income resulting from reduction in the amount of taxes withheld from paychecks is more likely to be spent. Because of this, it was argued that the 2009 change in the withholding rate would prove to be more successful at boosting household spending than previous tax rebates (Surowiecki, 2009). And, for this reason, the administration made a conscious decision to implement the 2011 tax cuts as a change in the withholding rate (Cooper, 2010).

Previous empirical studies, findings of which are briefly summarized in the prior section, paint a mixed picture with regards to changes in withholding leading to greater spending. The estimated MPCs in Parker (1999) and Souleles (2002) are quite high compared to other studies in the literature, varying between 50 and 90 percent. Over 1980-1991 (the period that overlaps with the Reagan tax cuts of changes in withholding), Souleles (1999) finds a much lower MPC – of between one-third and two-thirds – for the spring time federal income-tax refunds. Souleles (2002) interprets this to be consistent with the behavioral view that income is more likely to

be spent if it is received in small payments spread out over the course of the year, than if it is received as a lump-sum single payment.

On the other hand, Coronado et al. (2005) find that the proportion of respondents who report mostly spending the resulting income from the 2003 withholding change is similar to the corresponding proportion for the child tax credit rebate, which was implemented as part of the same Act as the withholding change, but as a one-time payment. Quite notably, Sahm et al. (2012) find that the mostly spending rate (of 13 percent) reported by survey respondents for the 2009 withholding change is in fact lower than their mostly spending rates (of between 23 and 30 percent) for the 2008 tax rebates (distributed as a one-time payment), a hypothetical one-time payment in 2009, and the actual one-time payment to retirees in 2009. The authors' interpretation of these differences is that they are driven by the different delivery mechanisms of these payments, with changes in withholding rates leading to less spending.

There could be several reasons for these contrasting results. These tax cuts: (1) have been introduced in varying economic conditions; (2) have targeted different subpopulations; (3) have varied in amounts; and (4) have been accompanied with varying levels of awareness by consumers. Each of these factors may lead to differences in the propensity to consume. In particular, the last factor – awareness of the tax cut – is arguably quite important; consumer response behavior can depend on whether the tax cuts are pre-announced or anticipated (Blundell, Francesconi, and van der Klaauw, 2011). The recent tax changes implemented as changes in the withholding rates were not as well-publicized as the earlier ones; anecdotal evidence suggests that households did not notice the change in the payroll tax withholding that was implemented in 2009 (Cooper, 2010). In fact, only 27 percent of our respondents were aware of a decrease in the 2011 FICA tax rate, when they were surveyed in early 2011.[6] Whether and how the behavioral response to the tax cuts varies by being explicitly aware of the tax cut is far from clear. Thaler's mental accounting hypothesis (1990; 1992) would suggest that those aware of the 2011 payroll tax cuts should spend a large proportion of them. However, if respondents are unaware of those gains in the first place, the response to them would depend on how they would spend each marginal dollar of income in their paycheck (or, if instead of optimizing utility, the respondent uses a rule-of-thumb, it will depend on whether their rule-of-thumb behavior targets spending or saving[7]). Unfortunately, policy-makers seem to have naïvely concluded that people would be more likely to spend income that they do not notice, when in fact their behavioral

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[6]We asked the following question: *"In addition to possible federal income taxes, all workers in the United States pay social security and Medicare taxes (called FICA taxes) on their earnings. These taxes, also known as payroll taxes, are automatically withheld from a worker's paycheck. To your knowledge, were there any changes in the FICA tax rate applied to your earnings in your first paycheck this year (excluding regular federal income tax withholdings), and if so what type of change?"*

[7]For those targeting spending (i.e., those with a specific target amount of how much to spend every month), the tax cut funds would be saved; on the other hand, the tax cuts would be largely spent by those who target saving.

response depends on their optimal decision rule for spending each marginal dollar of income.[8]

3   Data

The data used in this study were collected as part of the Household Income Expectations Project (HIEP) conducted by the Federal Reserve Bank of New York. The project is based on a panel survey that is conducted approximately every six weeks over the internet with RAND's American Life Panel (ALP). The sample for this panel survey consists of respondents who had participated in the Reuters/University of Michigan Survey of Consumers Survey between November 2006 and July 2010, and subsequently were recruited into the ALP.[9] The data for the current study come from two survey modules that were added as part of the panel at the beginning and end of 2011.

3.1   Survey Design

The first module was administered as part of the survey fielded over the period February-March 2011, with the goal of understanding how workers intended to use the payroll tax cut funds; 92 percent of the respondents had completed the survey by the end of February. Respondents, who reported being employed, were first asked if they were aware of any changes in the payroll tax rate in their first paycheck that year.[10] Those unaware of the decrease in the withholding rate were then informed about the 2% cut in the payroll tax rate. Respondents were then asked *"What are you doing or planning to do with the extra income?"*.[11] More specifically, they were asked to report the share of the extra income that they were using or planning to use to (1) spend, (2) save, and (3) pay down debt, with the requirement that the proportions add up to 100%. Consistent with the literature, we interpret this question as eliciting respondents' *intended* marginal propensities of tax cut usage. In particular, we interpret the proportion reported for spending as the *intended* Marginal Propensity of Consumption (MPC), the proportion allocated

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[8]Anecdotal evidence suggests that there was a conscious effort to design the 2009 and 2011 cuts as a change in the withholding rate, under the belief that people would be more likely to spend small payments that they may not even notice. President Obama, when describing the design of the tax cuts argued that it *"was the right thing to do economically, but politically it meant that nobody knew that they were getting a tax cut."* (Cooper, 2010).

[9]The Michigan survey is a monthly telephone survey with 500 respondents, consisting of a representative list assisted random-digit-dial sample of 300, and 200 respondents who were re-interviewed from the random-digit-dial sample surveyed six months earlier. Prior survey evidence on consumers' response to tax rebates uses this Survey of Consumers.

[10]The question was: *"In addition to possible federal income taxes, all workers in the United States pay social security and Medicare taxes (called FICA taxes) on their earnings. These taxes, also known as payroll taxes, are automatically withheld from a worker's paycheck. To your knowledge, were there any changes in the FICA tax rate applied to your earnings in your first paycheck this year (excluding regular federal income tax withholdings), and if so what type of change?"*

[11]This question was asked of only those respondents who did not report seeing a decrease in their first paycheck of 2011.

to saving as the *intended* Marginal Propensity of Saving (MPS), and the proportion allocated to paying down debt as the *intended* Marginal Propensity to pay down debt (MPPD). While paying down debt is a form of saving (and enters the same way in the budget constraint), consumers may think of paying down debt as distinct from saving. Therefore, we ask for it separately; prior survey research using the direct approach also makes this distinction.

To investigate how workers actually ended up using the 2011 payroll tax cut funds, we added a special module to the survey that was administered to the same respondents in December 2011, close to the original planned expiration of the payroll tax cuts. Sample respondents who reported currently being employed were asked: "*In addition to possible federal income taxes, all workers in the United States pay social security and Medicare taxes (called FICA taxes) on their earnings. These taxes, also known as payroll taxes, are automatically withheld from a worker's paycheck. In January 2011, the FICA tax rate for employees was cut by 2%. What did you do with the extra income?*" As with the question that asked respondents for their planned usage of the funds, respondents were asked for the proportion of the extra income that they used for spending, saving, and paying down debt. We interpret these proportions as measuring the *actual* marginal propensities.

3.2   Sample Characteristics

The initial survey was completed by 380 respondents. Of these, 209 reported to be employed and hence were eligible to answer the module on intended usage of the payroll tax cuts. Table 1 reports the demographic characteristics of the sample. For these 209 respondents, the average age is 55.9 years, with 57 percent of the respondents above the age of 54. The mean years of schooling is 15.3, and 59 percent of the respondents have a 4-year college degree. 48 percent of the sample is male, and 94 percent is white. While 12 percent of the sample has an annual family income of less than $35,000, about half report an annual family income of above $75,000.

Of the 380 respondents, 362 were re-surveyed in late-2011. Of these, 196 reported to be employed at the time of the survey (of whom 177 were also employed in the first survey), and hence answered the relevant questions regarding payroll tax funds use. The demographic characteristics of these 196 respondents, reported in the second column of Table 1, are similar to those of respondents in the first survey.

For the purposes of the analysis, we use the following sample selection criteria in the first survey. Of the 209 eligible respondents, 28 respondents reported seeing a decrease in their FICA tax rate but did not see an increase in their take home pay.[12] These 28 respondents were then

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[12]There are several plausible reasons for why that might happen. For example, it could be the case that the respondent's annual earnings exceed the threshold at which FICA taxes are phased out. Note that FICA taxes are imposed on only the first $106,800 of gross wages (for 2009, 2010, and 2011). Absent any other changes, a respondent making more than that amount annually would certainly have received a larger paycheck at the end of 2010 than he would in early 2011 (since he would be responsible for the 4.2% in FICA taxes in 2011). Then,

not asked about what they were going to do with the funds since they had no extra income, and are therefore dropped. That leaves us with 181 respondents. For the second survey, we restrict the analysis to those respondents who participated in both surveys and who were working at the time of both surveys; that leaves us with 156 respondents.[13] This criterion was chosen so that we could compare actual usage of the tax cut funds with the intended usage for the same respondents. Two more respondents are dropped because of missing data, leaving us with 154 respondents with complete data from both surveys.

Since our sample is older, and has higher income and educational attainment than the US population overall (due to the original ALP sample design), we use post-stratification weights based on population frequencies derived from the Current Population Survey (CPS). Each respondent in our survey is assigned at most two post-stratification weights, one from each survey in which they participated. For those in our first survey, weights are assigned based on the February, 2011, CPS Monthly Basic survey, and for those in our second survey, weights are assigned based on the December, 2011, CPS Monthly Basic survey.[14]

4 Empirical Results

4.1 Intended Use of Tax Cut Funds

The first column of Table 2 reports the average intended marginal propensity of tax cut funds use, as reported by respondents in the first survey. On average, respondents intended to use nearly half of the funds (48.31 percent) for paying down debt, a third (37.39 percent) for saving, and only 14.31 percent for spending/consumption (i.e., an unweighted intended MPC of 14.31). The large standard deviation indicates that there is substantial heterogeneity in intended usage of tax cut funds. This is further highlighted in Appendix Figure A1, which shows the distribution

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there could be other factors, such as the respondent incurring a wage cut starting in 2011, state taxes going up, or health insurance premiums increasing.

However, only 11 of the 28 respondents who report seeing a decrease in their take-home pay had family income exceeding $100,000. Therefore, it seems that the majority of these 28 respondents experienced one of the other factors.

[13]More specifically, this is how we go from 181 respondents in the first survey to 156 respondents in the second survey: 13 (of the 181) respondents did not take the second survey, while 12 (of the 181) respondents reported no longer working in the second survey.

[14]We construct the post-stratification weights in the following fashion: We count the number of respondents in each of 3 household annual income groups (<40K, 40K-75K, >75K), 2 education groups, 3 age groups, and 2 gender groups. The cutoff values for each of these were chosen to ensure no empty groups, and to evenly distribute our sample across all groups as best as possible. Thus, we are left with each respondent being assigned to one of 36 (3x2x3x2) groups based on his/her demographics. Then, we divide the group totals by the total sample size so that we have a proportion of the sample that each of the 36 groups accounts for. We do the exact same grouping, counting and dividing for the employed in the CPS Monthly Basic microdata for the two months mentioned above. To create the weights, we divide each group's CPS proportion by that group's proportion in our survey. The result is the post-stratification weight.

of intended marginal propensities. For example, 64.64 percent of respondents report an intended MPC of zero, and 4.4 percent report an MPC exceeding 80.

As can be seen in the second column of Table 2, applying the constructed post-stratification weights does not qualitatively (or quantitatively) change the point estimates. In the remaining analysis, we report weighted numbers unless otherwise noted. The regression analyses in the paper, based on these data, also use these post-stratification weights.

Previous survey research of consumer responses to tax rebates or changes in tax withholding (Shapiro and Slemrod, 1995, 2003a, 2009; Sahm et al., 2012) instead asks respondents for what they plan to do with most of the funds.[15] Columns 3 and 4 of Table 2 report the proportion of respondents that report intending to mostly use the tax cut funds for one of the three categories. A respondent is characterized as intending to mostly use the funds for a certain purpose (consume; save; pay debt) if the marginal propensity reported for that category is at least 50 (on a 0-100 scale). The weighted statistics show that 12 percent of respondents report that they will mostly spend the funds, 34 percent report that they will mostly save the funds, and 53 percent report that they will mostly pay debt with the funds. That is, paying off debt is the most common plan for the tax funds.

Note that 2 of the 154 respondents who do not assign a propensity of at least 50 to any one category are excluded from the analysis of most use. In addition, 16 respondents put a propensity of exactly 50 in two categories (e.g. spend 50%, save 50%). We assign such respondents (whom we refer to as "split" respondents) to both of the categories to which they assign a propensity of 50, but weight them by half. For example, in column (3) of Table 2, each non-"split" respondent has a weight of 1, and "split" respondents have a weight of 0.5 each. In column (5), as a robustness check, we report the weighted mostly-use proportions by excluding from the sample those 16 "split" respondents as well as respondents who did not assign a propensity of at least 50 to any category of use; results are qualitatively similar to those in columns (4).

4.2 Actual Use of Tax Cut Funds

Columns (6)-(10) of Table 2 show the actual usage of the tax cut funds, as reported in the second survey. Workers report spending, on average, 35.94 percent of the funds, a sharp increase from

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[15]Their question is phrased generally as follows: *"... will this income tax credit [tax rebate] lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?"*.

Shapiro and Slemrod (2003b) back out the marginal propensities from these responses by assuming that: 1) an individual reports "mostly spend" if her MPC is 0.5 or higher; 2) the modal MPC is equal to the average mostly-spend rate; and 3) the probability distribution function of individual MPC is piece-wise linear. While the first assumption is plausible, we find little support for the last two assumptions in our data. Figures A1 and A2 show that the modal intended and actual MPCs in our sample are zero, while the average intended and actual mostly-spend rates are very different from zero (12 and 35 percent, respectively). Similarly, as shown in Figures A1 and A2, the distributions of individual marginal propensities are not piece-wise linear.

the average intended MPC of 13.68 percent. As a result, both the actual marginal propensities of saving (MPS) and of paying debt (MPPD) are substantially lower than the intended marginal propensities. In fact, we reject the null hypothesis of the equality of the actual and intended marginal propensities for each of the three categories at the 5% level or higher (adjusted Wald t-test). Column (10) in Table 2 shows that 35 percent of individuals actually spent the majority of their tax-cut funds, compared with 9 percent of individuals who had intended to do so (difference statistically significant at the 1% level using Chi-squared test).[16] This proportion is at the higher end of the range of estimates found in most previous survey research analyzing response to tax cuts over the last decade.

As with the intended usage, the large standard deviations on the actual marginal propensities indicate that the response to tax cuts is heterogeneous. Figure A2 reports the distribution of actual marginal propensities. The distribution of actual MPC is quite disperse, with a substantial mass at zero, 50, and 100; 41.5 percent of respondents report an actual MPC of zero, 10 percent report an actual MPC of 50, and 22.5 report an actual MPC of 100. This heterogeneity in tax cut use is investigated in the next section.

Figure A3 compares individuals' intended use of the tax-cut funds (reported in the early 2011 survey) with what they reported actually doing with the funds. Of those who planned to spend most of their tax-cut funds, 71 percent did in fact spent the majority of it, while 22.2 percent saved the majority of it, and 6.9 percent mostly paid off debt. A similarly high proportion of those who intended to use the majority of their funds to pay off debt did so (67.1 percent). However, only 34.6 percent of those who planned to save most of their funds actually did so. Two patterns are of note in the figure: (i) while there is a positive correlation between intended and actual uses (as measured by share of the tax cut funds spent on a given category),[17] there is a high degree of inconsistency; and (ii) there is a systematic shift toward spending for those who did not use their funds in the way they intended to, that is, individuals ended up spending more of their tax-cut funds than they had intended.

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[16]Columns (8)-(10) are treated in the same fashion as columns (3)-(5). When computing these proportions, we drop 6 respondents who do not assign a propensity of at least 50 to any category. There are 19 respondents who allocate a propensity of exactly 50 to two categories; in columns (8) and (9), we assign such respondents to both categories but weight them by half. Column (10) of the table reports the weighted proportions excluding those 19 respondents, and we see that results are similar to those in column (9).

[17]The correlation between intended and actual share of tax cut funds used for consumption is 0.245, between intended and actual share for saving is 0.355, and for share used for paying off debt is 0.507 (all correlations statistically different from zero at the 5% level at least). This suggests that those intending to pay off debt are most likely to follow through with their plans.

4.3 Heterogeneity in Tax Cut Use

4.3.1 Response Heterogeneity by Demographics

We next investigate demographic differences in response to the tax cut. Panel A (B) of Table 3 reports the intended (actual) marginal propensities of the tax cut funds for various demographic groups.[18] Across the demographic groups, the first row of Panel A shows that the average intended MPC varies between 9.59 (for females) and 17.63 (for males). Panel B shows that, for each demographic group, the average actual MPC is significantly higher than the average intended MPC, varying between 28.40 percent for females and 43.29 percent for college-educated respondents.[19]

Columns (2) and (3) of Table 3 show that males have a significantly higher intended and actual average marginal propensity to consume (for example, their average actual MPC is 43.1 percent versus 28.4 percent for females). It is also notable that the average MPPD is twice as large for females (54.1 percent versus 26.6 percent for males).

The next two columns of Table 3 show how the MPC varies by age. Theoretically, as to what relationship to expect between age and MPC is unclear. The life-cycle model would predict the MPC for a temporary income shock to be higher for older respondents. On the other hand, since younger respondents are more likely to be liquidity constrained (Hayashi, 1985; Jappelli, 1990), one may see a higher MPC for them. Panel A shows the intended MPC is only marginally lower for older respondents (defined as those 55 years or older). The reverse pattern emerges for actual marginal propensities, where older respondents report a slightly higher average MPC than their younger counterparts.

Columns (6) and (7) of Table 3 show how the actual and intended marginal propensities vary by income. Popular notion would suggest that tax cuts would provide much needed spending money to those with lower incomes, who tend to be more liquidity constrained, and hence they should exhibit a higher MPC. However, Panel A of Table 3 shows that low-income workers report a lower intended MPC and a higher intended MPPD (differences not statistically significant from zero). Looking at the average actual marginal propensities in Panel B, we see that the average MPC for low-income workers is about 10 points lower than that of high-income workers (difference not statistically different from zero), and that their MPPD is significantly higher than that of high-income workers. The differences in the distribution of actual marginal propensities – with high-income workers using the largest share of the tax cuts for consumption and low-income workers using most of them to pay down debt – suggests that low-income workers have higher indebtedness, and have liquidity constraints that they also expect to bind in the future.

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[18]Table A1 in the Appendix shows the unweighted counterpart to Table 3. As can be seen, the unweighted statistics are qualitatively very similar to those reported in Table 3.

[19]The table reports a Wald t-test for equality of actual propensity versus intended propensity. In all cases, we reject the null that the intended and actual MPCs are equal at the 5% level at least.

The last two columns of Table 3 report the average propensities of the tax cut funds, conditional on whether the worker has a college degree. Since a college education is a good proxy for income, we would expect no-college workers to be more liquidity constrained, and hence more likely to consume the tax cut funds. The intended marginal propensities do not match up with this intuition, with college-educated workers reporting that they intend to spend a slightly higher proportion of the funds than no-college workers. How the two groups intend to allocate the part of the tax cut funds not spent is particularly striking: college-educated workers intend to save a large part of them, while no-college workers intend to use majority of them to pay off debt. Panel B shows similar differences in actual marginal propensities. Compared to their less educated counterparts, college-educated workers report a higher MPC (43.3 percent versus 31.7 percent) and a lower MPPD (26.5 percent versus 47.7 percent); only the latter difference is statistically different from zero. These patterns are similar to those for low-income workers, and again suggest binding liquidity constraints for no-college workers in the future. We re-visit these findings in a later section.

Table 4 translates the marginal propensities into the majority use of the tax cut funds. As mentioned above, we characterize a respondent as mostly using the funds for a certain purpose (consume; save; pay debt) if the reported marginal propensity for that category is at least 50 (on a 0-100 scale).[20] Panel A shows that, depending on the demographic group, between 2 and 15 percent of workers intended to mostly consume the tax cut funds. We see that, as was the case for the average MPC, females, older respondents, low-income workers, and no-college workers are less likely to intend to mostly spend their tax cut funds than their counterparts. As indicated by the p-value of a Pearson Chi-square test for independence of the usage distributions (reported in the last row of the panel), the distribution of intended "mostly" uses differs significantly by gender, age and income. Panel B shows that the proportion of respondents who report actually spending most of their tax cut funds is much higher, varying between 26 and 45 percent, depending on the demographic group. The distribution of actual "mostly" use is statistically different by gender and education (as indicated by the Chi-square test). Overall, the patterns that emerge in Table 4 are similar to those for the marginal propensities (Table 3).

4.3.2 Response Heterogeneity by Expectations

Our survey also included questions aimed at understanding the behavioral response to the tax cuts. We next explore how the (intended and actual) marginal propensities of tax cut use vary by these questions.

The first question can be seen as an indicator for the potential presence of future liquidity

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[20]Respondents who do not assign a propensity of at least 50 to any category, and those who assign a propensity of 50 each to exactly two categories ("split" respondents) are excluded from this table. Results are qualitatively similar if we keep the "split" respondents.

constraints. In the first survey, we asked respondents about their expectations about 12-month earnings changes in their current job: *"Suppose that, 12 months from now, you actually are working in the exact same job at the same place you currently work, and working the exact same number of hours. Twelve months from now, do you expect your earnings on this job, before taxes and deductions, to have gone up, or gone down, or stayed where they are now?"*. An individual who responds *"to have gone up"* to this question would arguably be less likely to be liquidity constrained in the future; 58 of the 154 respondents reported that they expected their year-ahead earnings to go up. If liquidity constraints were in fact important in determining the use of tax cut funds, we would expect these respondents to (intend to) spend a greater proportion of their funds.

Respondents were also asked about the likelihood that the payroll tax cut would be extended into the future. More specifically, the first survey included the question: *"In January 2011, the FICA tax rate for employees was cut by 2%. The tax rate cut only applies to this year. What do think is the percent chance that the tax rate will be extended into future years?"*. The response was elicited on a 0-100 scale. The average perceived likelihood of the payroll tax cut being extended was 30.9 percent, with 10 percent of the respondents believing the likelihood to be 1 percent or less, and 10 percent expecting the likelihood to exceed 60 percent. The permanent income model of consumption would suggest that those perceiving the tax cuts to be more permanent would have a higher MPC.

Table 5 examines how the response to the tax cuts varies by these variables. Columns (1a) and (1b) of Table 5 report the average marginal propensities for respondents who expect year-ahead earnings to increase and for their counterparts, respectively. Consistent with liquidity constraints being relevant for the intended use of the funds, we see that those who expect year-ahead earnings to increase report a higher intended MPC, however the differences in intended use of the tax cut funds between the two groups are not statistically significant. With regards to actual use, the MPC is very similar for the two groups (around 35 percent). We do, however, see that those who expect future earnings to go up are more likely to save the funds, and less likely to use them to pay off debt (differences not statistically significant at 5 percent or higher); this may reflect the fact that those expecting earnings to rise may have less debt. These findings could be driven by the underlying demographic differences in year-ahead earnings expectations; in the next section we investigate these patterns by controlling for observable characteristics in a multivariate regression framework.

The last two columns of Table 5 report the tax cut responses, conditional on perceived permanence of the payroll tax cuts. Consistent with the permanent income hypothesis, those believing the tax cut extension to be more likely (defined as responses above the median –33 percent— of the subjective distribution) are more likely to intend to consume the tax cut funds. However, while the intended MPC is higher for those who perceive the tax cuts to be more

permanent, the actual distribution of tax cut funds does not differ significantly for the two groups.

4.3.3 Multivariate Analysis

The previous two subsections show how the behavioral response to the tax cuts differs by demographic and other variables. However, since these variables may be correlated, testing for differences by all the characteristics simultaneously may be useful for understanding the underlying channels. We next explore that in a multivariate regression framework.

Column (1) of Table 6 reports the OLS estimates of a regression of the intended MPC on demographic variables. As was the case in Table 3, we see that males have a higher average intended MPC. While none of the estimates are statistically significant, we reject the null that the estimates are jointly zero at the 12% level. In column 2, we include additional variables capturing liquidity constraints and perceived permanence of the tax cuts; they are jointly significant at the 6% level. An increase in the perceived likelihood of tax cut extensions from zero (that is, absolute certainty about the tax cuts not being extended past 2011) to 100 percent (that is, absolute certainty about their extension) is related with a 16.1 points increase in the intended MPC (on a base of 14.3), with the coefficient being significant at the 10 percent level. This supports the permanent income hypothesis, as those who consider these tax cuts more permanent plan to spend more of the extra funds. Looking across the remaining columns in the table, we see that males and college-educated workers are significantly more likely to plan to use the funds for saving purposes, and less likely to plan to use them for debt servicing; the joint tests for the significance of the demographic variables are all statistically significant in columns (3)-(6), indicating that intended marginal propensities of saving and paying down debt vary significantly by these correlates.

Table 7 reports the corresponding regression estimates for actual marginal propensities. Column (1) shows that males, college-educated respondents and high-income workers have a higher average MPC (only the coefficient for males is statistically significant, but we reject the null that the demographic coefficients are jointly zero (p-value = 0.014)). With regards to the other variables, we see that, consistent with the permanent income hypothesis, the MPC is increasing in the perceived likelihood of the tax cut extension. Counter to the hypothesis that liquidity constraints are relevant in determining the response to tax cuts, respondents who expect future earnings to increase have a lower MPC. However, neither of the coefficients is statistically different from zero (we cannot reject the null that they are jointly zero; p-value = 0.556). In column (2), we add the intended MPC as a covariate. We see that the parameter estimates on the other variables remain qualitatively similar, and that intended MPC is a strong predictor of actual MPC.

Looking across the other columns in Table 7, several patterns are of note. As was the case

with intended marginal propensities in Table 6, males and college-educated respondents are likely to use a greater proportion of the funds for saving and a lower proportion for paying off debt. In addition, high-income respondents have a lower MPPD. Finally, relative to their counterparts, those expecting future earnings to increase – that is, those who expect liquidity constraints to relax in the future – are more likely to save the funds.

5   Discussion

5.1   Understanding the demographic heterogeneity in tax funds use

In this section, we use additional survey evidence to get more insights about the relationship between the marginal propensity of consumption and demographics that we observe in Section 4.3. Conventional wisdom would suggest that liquidity-constrained individuals would be more likely to spend the tax cut funds. To the extent that income (and a college education) is an indicator of the presence of liquidity constraints, our results are inconsistent with this. We also find that low-income and no-college respondents are significantly more likely to use the funds to pay down debt and less likely to save them (Tables 6 and 7). This suggests that either these groups are more highly indebted, and/or are more likely to perceive that liquidity constraints will bind in the future (and hence place a greater premium on improving their balance sheet). However, the results in Tables 6 and 7 continue to hold even after controlling for a crude measure of future liquidity constraints – expectations about changes in future earnings. It is possible that this measure does not fully capture the extent of future financial distress anticipated by the different groups. Here, with the goal of trying to understand the demographic heterogeneity in tax cut use outlined in Section 4, we investigate this further.

In Table 8, we report how various measures of current and (expected) future financial well-being vary by the demographic groups. Each column in the table reports estimates of an OLS regression of the dependent variable onto demographic variables. Column 1 reports how beliefs about job loss over the next year, as reported in the second survey, vary by observables. The question was as follows: "*What do you think is the percent chance that you will lose your job during the next 12 months?*". The mean response in our sample is 14.8 (on a 0-100 scale). We see that the coefficient for high-income respondents is significantly negative, indicating that low-income respondents perceive less job security.

Columns (2) and (3) report beliefs about year-ahead earnings, as reported in the first and second surveys, respectively. The dependent variable in these two columns is a dummy that equals 1 if the respondent answers "to have gone up" to the question: '*Twelve months from now, do you expect your earnings on this job, before taxes and deductions, to have gone up, or gone down, or stayed where they are now?*"; the response to this question in the first survey

is used in the analysis in the previous section. 37.8 and 41.1 percent of respondents expected twelve-month ahead earnings to increase in the first and second survey, respectively. The table shows that there is no significant demographic heterogeneity in the response to this question.

The remaining columns of Table 8 report how various other measures of financial distress vary across demographics. All these measures come from a separate survey, designed by us, that was administered to a different subsample over the internet, again with the RAND's American Life Panel (ALP), in January 2011. The goal of the survey was to understand how US households were coping financially following the end of the Great Recession. Since this subsample was originally recruited into the ALP the same way as our original respondents, and is similar in terms of observable characteristics to our main sample, investigating how different measures of financial well-being vary across these respondents is informative about how the financial state of respondents differs by their demographics.

Columns (4) and (5) of Table 8 show that perceived past and future credit access do not systematically differ across the demographic groups.[21] This suggests that perceived changes in future credit constraints are unlikely to explain the demographic differences in the MPC that we observe. The prior that low-income respondents should be more liquidity constrained is further confirmed in column (6), which uses a respondent's reported chance of being able to come up with \$2,000 if an emergency arose within the next month. The question, adapted from Lusardi, Schneider, and Tufano (2011), was: "*What is the percent chance (or chances out of 100) that you could come up with \$2,000 if an unexpected need arose within the next month?*". While Lusardi et al. (2011) use this as a measure of a respondent's financial fragility, we believe it is also a good proxy for liquidity constraints. The mean of this variable in our sample is only 69.2 percent. More importantly, high-income, college-educated, and male respondents report significantly higher chances of being able to deal with this kind of financial emergency, indicative of their counterparts being more liquidity-constrained. This would then suggest that their counterparts should have exhibited a higher MPC. However, column (7) shows that low-income respondents, on average, have significantly higher non-mortgage debt-to-income ratios (compared to high-income respondents, their ratio is 21.73 points higher). The higher debt of the lower-income respondents could explain why they use more of their funds to pay off debt than the higher-income group (an actual MPPD of 47.7 percent compared with 29.6 percent for the high-income respondents).

Finally, the last column of Table 8 uses the reported percent chance of declaring bankruptcy over the next year as the dependent variable. The question was "*What is the percent chance that over the next 12 months you [(or your spouse/partner)] will file for bankruptcy?*". The mean response to this question is 5.17 percent (on a 0-100 scale). We see that high-income and college-

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[21]The question about past credit access, for example, was worded as follows: "*Do you believe it generally has been easier, harder or equally difficult to obtain credit or loans during the last year when compared to the year before?*" As can be seen in column (4) of Table 8, 40 percent of respondents answered "harder" to this question.

educated respondents report a significantly lower likelihood of this. This is consistent with the groups identified earlier (low-income, no-college, and young) expecting liquidity constraints to bind in the future.

The findings from this table help explain why groups that are generally identified as being liquidity constrained have a lower MPC. They are more heavily indebted than their counterparts – which would explain why they are likely to use more of their tax funds to improve their balance sheets – and they also expect binding liquidity constraints in the future. Then our finding that high-income respondents have a higher MPC is not inconsistent with the permanent income hypothesis, since it predicts that a liquidity-constrained individual would exhibit a higher MPC than an unconstrained individual, but only if the constrained individual expects those constraints to relax in the future.

5.2   Inconsistency between Intended and Actual Use

In Section 4, we see that actual marginal propensities differ significantly from intended plans, across all demographic groups. The average gap between actual and intended consumption is about 24.5 percentage points. This systematic shift towards spending more of the funds than intended is, however, hard to explain through simple measurement error.[22] We next discuss two plausible explanations for the systematic shift towards greater consumption: (1) individuals being naïve (or partially sophisticated) present-biased consumers; and (2) aggregate (unanticipated) shocks.

5.2.1   Present-Bias

With regards to the first explanation, consider a present-biased individual who is unaware of her time-inconsistent preferences (in the terminology of O'Donoghue and Rabin (1999), she is a naïve present-biased agent). She will report a low intended MPC, but because she is unaware of her present bias, she will end up over-consuming and report a higher actual MPC (Thaler and Shefrin, 1981; Laibson, 1997).[23] We test for this explanation by using an individual-specific measure of whether the respondent is present-biased, using an incentivized intertemporal choice of allocating \$500 between 2 checks under different time frames and interest rates.[24] Details of the incentivized procedure are given in Appendix Section A. The incentivized task only

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[22]Intentions and actual behavior may diverge simply because of the dependence of behavior on events not yet realized at the time of the survey that elicits intentions. Manski (1990) shows that intentions and behavior will diverge even if responses to intentions questions are the best predictions possible given the available information.

[23]A similar anomaly in behavior would be observed for a partially sophisticated present-biased consumer who has access to commitment. She knows she has a present bias, so uses a commitment device, and reports a low intended MPC. However, since she is only partially sophisticated, she underestimates the extent of her present bias and does not use a strong enough commitment, and ends up over-consuming (O'Donoghue and Rabin, 1999).

[24]We thank Leandro Carvalho for sharing these data with us. These were collected in ALP module number 212 (see Barcellos and Carvalho, 2012).

measures the shape of the respondent's discount function; it does not allow us to infer whether the respondent is aware of the bias (sophisticated) or not (naïve).

35.5 percent of the respondents (54 of the 152 respondents for whom we have these data) are found to have time-inconsistent preferences. The first column of Table A2 regresses the hyperbolic dummy (which equals 1 if the respondent has time-inconsistent preferences) onto demographics. We see that high-income respondents are significantly less likely to be hyperbolic; the estimate indicates that they are half as likely as low-income respondents to be hyperbolic. Older, college-educated, and female respondents are less likely to be hyperbolic; while none of these estimates are statistically different from zero, we reject the null that the demographic variables are jointly zero (p-value = 0.0794). These demographic differences in time-inconsistent preferences are particularly interesting since they suggest that individuals with liquidity constraints – younger and low-income respondents – also have more self-control problems. Previous literature, while acknowledging the possibility of a systematic correlation of self-control problems with liquidity constraints has been unable to distinguish the two, largely because data on measures of self-control problems are generally not available (Gross and Souleles, 2002; Mian and Sufi, 2011).[25]

In Table 9, we investigate correlates of switching to greater consumption. The dependent variable is (actual MPC – intended MPC), that is, the difference between actual and intended marginal propensity to consume. Column (1) regresses this variable onto demographic variables. None of the variables are statistically different from zero; this is as expected, since Table 3 shows that all demographic groups are over-consuming relative to their intentions. In column (2), we regress the difference onto a hyperbolic dummy: we see that the estimate is negative and indistinguishable from zero. For present-bias to be a factor in the shift toward greater consumption, what is required is that the respondent be present-biased, but also that she be unaware of her bias. Thus, the interpretation of the coefficient is ambiguous, and we return to it later below.

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[25]Given our finding that traditionally liquidity-constrained groups have a lower intended and actual MPC, it is unlikely that not controlling for time-inconsistent preferences (self-control issues) biases our findings. In the remaining columns of Table A2, we include the hyperbolic dummy and a financial literacy dummy (that we describe below) to the specifications in Tables 6 and 7 that reported the OLS estimates of correlates of intended and actual marginal propensities. Three things are of note. One, the parameter estimates on all the earlier correlates are qualitatively similar to those in the corresponding specifications in Tables 6 and 7 that excluded these two new controls, suggesting that our interpretation of results is not affected by not including these two measures. Second, columns (2) and (5) of Table A2 show that the coefficient on the hyperbolic and financial literacy dummies are not statistically different from zero; in particular, the hyperbolic dummy has a negative coefficient (and not a positive one, as one would expect). Third, hyperbolic respondents report significantly higher intended and actual marginal propensities of paying down debt and lower propensities to save; the converse is observed for high financial literacy respondents. The third finding is in line with the demographic heterogeneity in tax cut funds use, and is not surprising: liquidity-constrained individuals – proxied by respondents who are low-income – are more likely to be hyperbolic (see first column of Table A2) and less likely to have high financial literacy (results not reported here). Then, this last finding of hyperbolic and low-financial literacy respondents being more likely to use the funds to pay off debt and less likely to save them is intuitive.

Since financial literacy has been shown to be correlated with better financial outcomes (Lusardi and Mitchell, 2009), column (3) investigates whether high financial literacy corresponds to a closer correspondence between intended and actual behavior. We construct our measure of financial literacy from four multiple–choice basic financial literacy questions, adapted from Lusardi and Mitchell (2009), that were answered by our respondents (questions available from authors upon request). We construct a high financial literacy dummy that equals 1 if the respondent answers at least three of the four questions correctly, and zero otherwise; 21 of the 154 respondents are coded as having high financial literacy. We see that financial literacy is not related with a closer correspondence between intended and actual MPC—the coefficient while not statistically different from zero is in fact of the opposite sign that one would expect.

We now return to the interpretation of the result in column (2), that present bias is unrelated to the shift toward greater consumption. This null result could either suggest that the discrepancy that we observe between intended and actual consumption is not a consequence of present-biased preferences, or that respondents who we identify as being present-biased are sophisticated.[26] To distinguish between these two interpretations, we use the respondent's financial literacy as a proxy for her sophistication.[27] Column (4) of Table 9 estimates the regression:

$$\Delta MPC_i = \beta_o + \beta_1 1_{i,PresBiased} + \beta_2 1_{i,HighFinLit.} + \beta_3 1_{i,PresBiased} * 1_{i,HighFinLit.} + \epsilon_i,$$

where ΔMPC_i is the difference between actual and intended MPC for individual i. The indicator function $1_{i,K}$ equals 1 if respondent i belongs to group K, and zero otherwise. In this specification, β_1 is the effect of present-bias for a naive respondent on the consumption gap, while $\beta_1 + \beta_2 + \beta_3$ is the effect of present-bias for a sophisticated agent on the gap. If present-bias that is unperceived by the respondent were driving the shift toward greater consumption, we would expect β_1 to be positive. That is in fact the case, but the coefficient is not statistically different from zero. The estimate is small in economic terms as well: unperceived present-bias explains less than 10 percent of the shift toward greater consumption (1.81 points out of an average MPC gap of 23.80 points). The effect of present-bias of agents who are aware of the bias is -4.1 (estimate not distinguishable from zero), indicating that individuals aware of their bias do have smaller gaps between actual and intended consumption. The results are qualitatively similar when we add in all the covariates simultaneously in the last column of Table 9. Overall, these estimates suggest that the discrepancy that we observe between intended and actual consumption is not a consequence of present-biased preferences.

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[26] A sophisticated hyperbolic agent would ex-ante know that she will consume more (since she is aware of her bias), and would therefore report an intended MPC that would be closer to the actual MPC. In that case, we would not observe any systematic relationship between present bias and the consumption gap.

[27] While there is a large empirical literature on the role of present-biased preferences in consumers' decisions (see Dellavigna, 2009, for an overview), there is little empirical work that is able to measure whether the respondent is naïve or sophisticated (Kuchler, 2012).

5.2.2 Unanticipated Shocks

We next turn to the second possible explanation for the incongruity in intended and actual consumption: unanticipated shocks. In the first survey, we elicit respondents' year-ahead earnings expectations, and ask for the expected magnitude of change in year-ahead earnings relative to current earnings. In addition, both surveys collect data on the respondent's earnings; this allows us to calculate the realized (approximate year-ahead) change in earnings. Our measure of unanticipated shocks at the individual level is then the realized percent change in earnings *minus* expected percent change in earnings. A positive value of this metric indicates a positive shock to earnings. The mean of this variable, reported in the first column of Table 10, is 5.1 percentage points (that is, on average, realized earnings changes are 5.1 percentage points better than expected changes), with the 10th percentile being -8.8, and 90th percentile being +14.1.[28] Column (2) of Table 10 regresses the change in MPC (that is, actual minus intended MPC) onto this measure of unanticipated change in earnings. The coefficient is positive and statistically significant at the 5% level, suggesting that unanticipated earnings shocks do explain some of the gap between intended and actual consumption. However, the coefficient suggests that, for an average unanticipated change in earnings (of +5.1 percent points), the propensity to consume increases by about 0.82 points. That is, earnings shocks explain only 3.3% of the average shift in MPC.

It is possible that individuals receive shocks along other dimensions during this period. In the absence of additional data on individual-specific shocks (which would require richer individual-level data on year-ahead expectations in early 2011, and realizations for the same outcomes in late 2011), we use state-level variations in the evolution of various economic indicators during the course of 2011 (relative to their trend during 2010) as proxies for unanticipated shocks at the individual level. The implicit underlying assumption here is that any deviations during 2011 from the trend observed in 2010 is construed as an unanticipated shock by the individual.[29] The specification we use is:

$$\Delta MPC_{is} = \alpha_o + \beta(\Delta I_s^{2011} - \Delta I_s^{2010}) + \epsilon_{is} = \alpha_o + \beta\Delta(\Delta I_s^{11,10}) + \epsilon_{is}, \tag{1}$$

where ΔMPC_{is} is the difference between actual and intended MPC for individual i in state s, and ΔI_s^t is the annual change in economic indicator I in state s during year t. $\Delta(\Delta I_s^{11,10})$ then denotes the change in economic indicator I in state s during 2011, relative to its change in

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[28]We are able to construct this variable for 141 of the 154 respondents. Of the 13 respondents who are dropped, 8 have missing data on either earnings and/or expectations, while 5 retired at some point between the two surveys.

[29]In an alternate specification that yields qualitatively similar results, we use only the state-level variation in changes in economic indicators during 2011 as a proxy for individual-level shocks. This is a reasonable proxy for shocks under the somewhat restrictive assumption that respondents' year-ahead expectations in early 2011 are orthogonal to their state of residence.

2010. We consider the following economic indicators: unemployment (source: Bureau of Labor Statistics (BLS)); payroll employment (source: Survey of Business Establishments conducted by the Current Employment Statistics of the BLS); the CoreLogic National Home Price Index; Gross State Product (source: Bureau of Economic Analysis); proportion of consumer debt that is at least 90 days delinquent (source: FRBNY Consumer Credit Panel/Equifax (CCP); see Lee and van der Klaauw, 2010, for a description of this data source); and, auto loan originations (source: CCP).

The first column of Table 10 shows that there is substantial variation in these indicators across states. For example, in the 41 states that our sample spans, the mean change in the unemployment rate during 2011 (relative to the change in 2010) was -0.03 points, with the 10th percentile being -0.8 points and the 90th percentile being 0.7 points. The remaining rows in this column show substantial deviations in the 2011 changes in these variables relative to their changes in 2010. Columns (3)-(8) of Table 10 report the OLS estimates of equation (1) for each of these indicators.[30] If the shift to greater consumption were driven by shocks, we would expect the coefficient for ΔUnemployment and ΔDelinquency to be negative, while the others to be positive. The signs of the coefficients are in line with this hypothesis, except for the coefficients for the unemployment rate and payroll employment (columns (3) and (4)). However, with the exception of the coefficient on home price index (column (5)), none of the coefficients are different from zero at conventional levels of significance. The last column of the table shows estimates of a specification where all the economic indicators (as well as unanticipated changes in earnings) are entered simultaneously. The coefficients for changes in earnings, home price index, and delinquency rate are statistically different from zero and are of the "correct" sign. In fact, we reject the null hypothesis that the coefficients are jointly equal to zero (p-value = 0.021). However, the R-squared of the specification is somewhat low (0.092), and the estimates are quite small economically. For example, based on the estimates in the last column, an average change during 2011 in the home price index (of 1.5 points relative to the percent change in the index during 2010) results in a change of about 5 points in the dependent variable (which has a mean of about 24). Overall, the results in Table 10 indicate that, while we cannot rule out the hypothesis that unanticipated shocks are a factor in explaining the systematic shift toward greater consumption, they explain only a small part of the shift.

In light of the findings that the systematic shift towards greater consumption is unlikely a consequence of present bias and only partly explained by unanticipated shocks, we hypothesize that the inconsistency that we observe is likely a result of the respondent using different mental

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[30]Note that we use the percent change in all indicators, except for simple changes in the unemployment and delinquency rates. Further note that for unemployment, payroll employment, and house prices, we take changes over the period January-December 2011 (and, January-December 2010); for auto originations and delinquency rates, we use changes in 2011Q4 relative to 2010Q4 (and, 2010Q4 relative to 2009Q4); and, for Gross State Product (GSP), which is available annually only, we use the changes in the annual GSP for 2011 relative to the 2010 GSP, and changes in the 2010 GSP relative to the 2009 GSP.

accounts when reporting the intended and actual marginal propensities for small disaggregated tax cuts such as the payroll tax cut (Thaler, 1992). When reporting her intended MPC at the beginning of the year, a respondent may look ahead to the year and think of the amount in aggregate (which, for a household with median earnings of $50,000, would amount to a hefty $1,000), and treat this large amount as an increment to her asset account and report a low intended MPC. However, when receiving incremental boosts to her paycheck spread out over the course of the year (which for a median household receiving a paycheck twice a month would mean only an additional $42), she may treat this small gain as current income. That could then lead to a systematic inconsistency between actual and intended marginal propensities, with a higher actual MPC.

Note that prior studies have found that the planned and actual usage (reported retrospectively) of tax rebates tend to be quite similar (Shapiro and Slemrod, 2003; Sahm, Shapiro, and Slemrod, 2010). However, both these studies examine the response to one-time lump-sum tax rebates. A mental accounting framework would yield the same intended and actual MPC for such rebates, since the respondent would use the same mental account when reporting the intended and actual marginal propensity for one-time transfers.[31]

Our results have implications for survey design in the context of evaluating consumer response to tax cuts, and underscore the need for survey research to distinguish between intended and actual marginal propensities for tax cuts that are disaggregated over time, since intended and actual responses to such tax cuts are likely to be quite different. On the other hand, such distinction may not be necessary for lump-sum tax rebates.

5.3   Relationship with Prior Studies

Our finding that only 12 percent of workers intend to spend most of the funds is lower than estimates of at least 20 percent from previous studies that employ a survey methodology and ask respondents for what they mostly plan to do with one-time tax rebates implemented since 2001 (Shapiro and Slemrod, 2003a, 2009). However, our proportion is almost identical to the estimate of 13 percent found by Sahm et al. (2012) for reduced income tax withholding in 2009, which was a tax credit delivered through a mechanism similar to that for the tax cut in question here.

Data from the second survey shows that 35 percent of individuals actually spent the majority of their tax-cut funds. The average actual MPC in our sample is 35.94 percent. Our proportion of

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[31]Another possible explanation for this is that it may be easier to have targeted and well-defined plans for using one-time tax rebates/cuts. In fact, Bronchetti et al. (2011) find that (low-income) tax filers have well-defined and targeted plans for using their refunds. That would lead to a closer correspondence between intended and actual behavioral response to lump-sum transfers. However, this still cannot explain a systematic shift towards greater spending that we observe.

"most use" is much higher than those found in most prior studies that use a survey approach,[32] while our estimated MPC is in the higher end of the range found in studies that examine consumer response to tax rebates in the last decade (see discussion of related literature in Section 2.1.). This suggests that the design of the tax cut, in the form of changes in the withholding rate, perhaps led workers to spend a non-trivial proportion of them. In addition, our finding that the most common intended and actual use of the extra income is to pay down debt (with an intended MPPD of 53 percent, and actual MPPD of 37 percent) is consistent with findings in recent studies that use surveys to elicit respondents' usage of tax rebates, and is reflective of a regime of high consumer indebtedness.

There is substantial heterogeneity in how the extra income is utilized by our sample respondents. In particular, we find that groups that are generally believed to be liquidity constrained – low-income and low-education respondents – have a lower MPC and do not spend relatively more of the extra income, as is commonly claimed. Earlier studies have found mixed evidence on the relationship between income and the use of extra income from tax changes. One set of studies finds patterns that are consistent with the liquidity-constraints story: Souleles (1999) finds a quicker increase in spending for households facing liquidity constraints; Johnson et al. (2006) and Parker et al. (2011) find that lower-income households spent a higher fraction of their 2001 and 2008 tax rebates, respectively; and, Agarwal et al. (2007) find that spending rose most for liquidity-constrained consumers, and debt declined most for those who are unconstrained. The other set of studies fails to find evidence of usage of the funds consistent with the conventional liquidity constraints hypothesis: Heim (2007) finds no significant difference in the consumption response of high and low assets-to-income ratio respondents to various state tax rebates; Shapiro and Slemrod (2003a) do not find that the MPC is higher for low-income respondents for the 2001 rebates; Shapiro and Slemrod (2009) and Sahm et al. (2010) find similar results for the 2008 rebates. The last three studies in fact find that the propensity to spend is higher for the higher income groups. Our results are in line with the latter set of studies. More importantly, using data from a companion survey, we show that low-income and younger respondents are more heavily indebted than their counterparts and they also expect binding liquidity constraints in the future. That is, the heterogeneity in response that we find seems to be rational.

6   Conclusion

Using innovative survey questions, this paper investigates workers' response to the 2011 payroll tax cuts. In line with previous studies that examine how consumers react to income increases

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[32]It should, however, be mentioned that most prior studies ask respondents for what they plan to do with the tax rebates/cuts, and not what they actually did. As we argue above, this distinction may be important for disaggregated tax cuts.

resulting from changes in tax policy, our findings reject the life-cycle/permanent income theory: we find that a non-trivial proportion – 36 percent – of the extra income is spent by the respondents. There is substantial demographic heterogeneity in how workers (intend to) use the funds; rich data from a supplementary survey suggest that these patterns can be explained by differences in current and (perceived) future liquidity constraints and debt-indebtedness across the demographic groups. We also find that respondents intend to disproportionately cut down spending – by 71.4 percent of the amount of the tax cut – in the scenario that the tax cuts are not extended.[33]

Our estimated actual MPC is at the higher end of the estimates the literature has obtained for the tax cuts enacted since the early 2000s. This suggests that perhaps, as policy-makers had originally hypothesized, the mechanism through which the cuts were implemented (that is, as a change in withholding rather than a lump-sum transfer) did lead consumers to spend a greater proportion of the extra funds than they would have done under alternate mechanisms. This finding would seem to be at odds with Sahm et al. (2012), who find a lower (intended) MPC for the 2009 withholding change than for lump-sum rebates. However, we are able to rationalize this apparent inconsistency by showing that the MPC for the withholding change based on intended use (rather than actual use) in our sample is in fact quite low, and similar to their estimate for the 2009 withholding change.[34]

In addition, our finding that workers who perceive tax cuts to be more permanent plan to (and actually weakly do) spend more of the extra income is consistent with the permanent income hypothesis. This has important fiscal policy implications as to whether such tax cuts are implemented as long-term extensions or sequential short-term extensions. Our results indicate that the propensity to consume would likely have been higher had the tax cuts been implemented as a two-year cut in the first place.

While intended and actual marginal propensities are strongly correlated, the two differ systematically: we find a systematic switching towards consumption, regardless of intended use. Notably, we find that this shift: (1) is exhibited by all demographic groups, (2) is not explained by time-inconsistent preferences (as would otherwise be the case under those self control problems that the respondent is unaware of), and (3) only partially explained by unanticipated shocks. Given that prior survey research finds a strong correspondence between planned and actual marginal propensities to consume for one-time lump-sum rebates, our results suggest that the correspondence between intended and actual usage for tax cuts – at least those implemented as disaggregated additions to the paycheck spread out over the year – may be quite low. We

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[33]In the second survey, respondents were asked about how they would respond to the expiration of the payroll tax cuts. Appendix Section B shows that the expiration of the payroll tax cuts would lead workers, across all demographic groups, to disproportionately reduce consumption with little change in debt balances.

[34]The question text used by Sahm et al. (2012) asks respondents for their planned usage, which may be a biased estimate of actual propensity to consume if intended and actual behavior is incongruous, as we argue is likely to be the case for disaggregated tax cuts.

hypothesize that this may be a consequence of workers focusing on the annual stimulus when asked for the intended use, and on the monthly amount when reporting (and deciding) the actual use; this would then lead respondents to use different mental accounts when reporting intended and actual usage (Thaler, 1990; 1992). This finding of ours has implications for survey research that elicits consumers' MPC, and indicates that a distinction between intended and actual usage is warranted in some cases— particularly for tax cuts that are disaggregated over time (opposed to one-time transfers).

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	Initial Survey	Second Survey
Total number of respondents	380	362
Number of respondents working full-time	209	196
Percent of Male respondents	48	51
Percent of respondents who are White	94	94
Age	55.9	56.2
	(5.90)	(5.94)
Percent of respondents with age > 54 years	57	57
Number of schooling years	15.3	15.2
	(2.29)	(2.27)
Percent of respondents with a College degree	59	58
Average income	92,161.1	90,903.8
	(57,895)	(56,017)
% of respondents with annual income < \$35,000	12	13
% of respondents with income between \$35,000-\$75,000	36	36
% of respondents with annual income > \$75,000	51	51

Averages reported for continuous variables. Standard deviations in parentheses.

Table 2: Intended and Actual Reported Use of Tax Cut Funds

	Intended[a]					**Actual**[b]				
	Marginal Propensity[c]		"Mostly" Use[d]			Marginal Propensity		"Mostly" Use		
	Unweighted	Wgt.[e]	Unwgt.	Wgt.	Exl. comb.[f]	Unwgt.	Wgt.	Unwgt.	Wgt.	Exl. comb.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Consume	14.31	13.68	0.12	0.12	0.09	38.77	35.94	0.37	0.35	0.35
	(24.93)	(2.04)				(40.24)	(5.28)			
Save	37.39	33.30	0.37	0.34	0.33	25.33	24.01	0.25	0.23	0.23
	(41.19)	(3.30)				(35.05)	(5.54)			
Pay down debt	48.31	53.02	0.49	0.53	0.59	35.77	40.01	0.33	0.37	0.43
	(46.44)	(3.91)				(43.66)	(6.44)			

For marginal propensities, mean response in first cell. Standard deviations in parentheses. For "most" uses, proportion of respondents (0-1) reported.

[a] Intended use of tax cut funds reported in the first survey. Respondents were asked: "Please indicate what share of the extra income you are using or plan to use to..." on a 0-100 scale.

[b] Actual use of tax cut funds reported in the second survey. Question: "What did you do with the extra income? Please indicate what share of the extra income you ..." on a 0-100 scale.

[c] The average response to the question in a.

[d] Respondents are coded as using the funds to mostly consume/save/pay debt if the reported marginal propensity is at least 50 (on a 0-100 scale).

[e] Weighted numbers reported (see text for how weights are constructed).

[f] Restrict the sample to those respondents who assign a marginal propensity of at least 50 to one category, and there is no tie.

Table 3: Marginal Propensities of Tax Cuts Use, by Demographics

	All	Male	Female	Age > 54	Age ≤ 54	High Inc[a]	Low Inc	College	No College
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Observations	154	79	75	82	72	77	77	89	65
Panel A: Intended									
Consume	13.68+++	17.63**++++	9.59+++	12.50+++	14.62++	15.81+++	12.14+++	16.30+++	12.18+++
	(2.04)	(3.51)	(2.01)	(2.38)	(2.96)	(3.68)	(2.30)	(2.97)	(2.72)
Save	33.30++	40.43**+	25.90	34.14++	32.63	37.86+++	30.00++	42.05**++	28.30
	(3.30)	(5.06)	(4.19)	(4.34)	(4.97)	(4.39)	(4.71)	(4.46)	(4.51)
Pay down debt	53.02++	41.94***+	64.51	53.36	52.75	46.33	57.86	41.65**+	59.52
	(3.91)	(5.96)	(5.03)	(5.61)	(5.34)	(5.04)	(5.67)	(4.99)	(5.45)
Panel B: Actual									
Consume	35.94	43.10**	28.40	38.87	33.67	42.10	31.42	43.29	31.73
	(3.59)	(5.57)	(4.47)	(4.69)	(5.25)	(5.64)	(4.66)	(5.63)	(4.64)
Save	24.01	30.20**	17.49	22.47	25.20	28.35	20.82	30.06	20.55
	(3.09)	(5.16)	(3.29)	(3.44)	(4.84)	(5.42)	(3.60)	(5.50)	(3.71)
Pay down debt	40.01	26.61***	54.11	38.56	41.13	29.56***	47.68	26.52***	47.73
	(3.60)	(5.06)	(5.12)	(5.33)	(4.84)	(4.41)	(5.34)	(3.91)	(5.20)

Table reports the average propensities (on a 0-100 scale). Standard deviations in parentheses.
[a] High income is the group of respondents with annual income ≥ $75,000.
Adjusted Wald t-test conducted for equality of actual propensity versus intended propensity. +++, ++, + denote difference significant at 1, 5, and 10%, respectively.
Adjusted Wald t-test conducted for equality of responses for female against male; age > 54 vs. age ≤ 54; high income vs. low income; college vs. no college. ***, **, * denote difference significant at 1, 5, and 10 percent, respectively. Asterisks reported on the female, age > 54, high inc., and college columns, respectively.

Table 4: Tax Cut "Mostly" Uses by, Demographics

	All	Male	Female	Age > 54	Age ≤ 54	High Inc[a]	Low Inc	College	No College
Panel A: Intended									
Observations	136	71	65	68	68	68	68	79	57
Mostly Consume	0.09	0.15***	0.02	0.02***	0.14	0.15**	0.04	0.12	0.07
Mostly Save	0.33	0.39	0.26	0.34	0.32	0.37	0.30	0.40	0.29
Mostly Pay down debt	0.59	0.46***	0.72	0.64	0.54	0.48**	0.66	0.48**	0.65
Chi-Square Test[b]		0.001		0.030		0.048		0.140	
Panel B: Actual									
Observations	129	69	60	70	59	68	61	74	55
Mostly Consume	0.35	0.43*	0.26	0.38	0.32	0.41	0.30	0.45	0.29
Mostly Save	0.23	0.31**	0.14	0.20	0.25	0.27	0.19	0.29	0.19
Mostly Pay down debt	0.43	0.26***	0.60	0.42	0.43	0.32**	0.51	0.27***	0.52
Chi-Square Test		0.001		0.721		0.101		0.027	

Table shows the fraction of each column group who assign a proportion of more than 50 (out of 100) to that purpose. Proportions do not add to one due to a few individuals who do not report a majority use.

[a] High income is the group of respondents with annual income ≥ $75,000.

[b] p-value of a Pearson Chi-square test for independence of distributions by demographic groups (female against male; age > 54 vs. age ≤ 54; high income vs. low income; college vs. no college.

In addition, Chi-square conducted for equality of proportions for females and males; age > 54 and age ≤ 54; high income and low income; college and no college. ***, **, * denote difference significant at 1, 5, and 10 percent, respectively.

Table 5: Marginal Propensities of Tax Cuts Use, by Various Expectations

| | All | Initial Survey Earnings Exp[a] | | Future Tax Cut Extension[b] | |
| | | Up | Same/Down | Likely | Unlikely |
		(1a)	(1b)	(2a)	(2b)
Observations	154	58	96	74	80
Intended					
Consumption	13.68	17.40	11.45	16.90*	10.56
	(3.67)	(3.27)	(2.48)	(3.25)	(2.17)
Save	33.30	32.18	33.97	32.87	33.72
	(5.82)	(4.91)	(4.30)	(4.83)	(4.61)
Pay down debt	53.02	50.42	54.58	50.24	55.72
	(7.26)	(6.45)	(4.90)	(5.74)	(5.25)
Actual					
Consumption	35.94	35.18	36.45	38.29	33.67
	(5.28)	(6.30)	(4.17)	(5.06)	(5.06)
Save	24.01	31.18*	19.16	23.45	24.55
	(5.54)	(6.22)	(3.08)	(3.98)	(4.90)
Pay down debt	40.01	33.64	44.31	38.17	41.78
	(6.44)	(5.76)	(4.44)	(5.71)	(4.68)

Table reports the average propensities (on a 0-100 scale). Standard deviations in parentheses.
[a] 12-month ahead earnings expectations, elicited as follows: "Suppose that, 12 months from now, you actually are working in the exact same [/main] job at the same place you currently work, and working the exact same number of hours. Twelve months from now, do you expect your earnings on this job, before taxes and deductions, to have gone up, or gone down, or stayed where they are now?"
[b] Extension expectations are elicited as follows: "What do think is the percent chance that the tax rate cut will be extended into future years?". Respondents above (below) the median of the distribution are coded as likely (unlikely).
Adjusted Wald t-test conducted for equality of responses in columns (a) versus corresponding column (b). ***, **, * denote difference significant at 1, 5, and 10 percent, respectively.

Table 6: Correlates of Intended Marginal Propensities of Tax Cut Funds Use

	Consumption		Saving		Pay down Debt	
	(1)	(2)	(3)	(4)	(5)	(6)
College	2.68	2.53	11.60*	11.89**	-14.28*	-14.42*
	(4.94)	(4.72)	(5.96)	(5.98)	(7.64)	(7.53)
Male	7.88*	8.28*	13.97**	14.29**	-21.84***	-22.58***
	(4.09)	(4.28)	(6.63)	(6.84)	(7.88)	(8.08)
Age	0.097	0.106	0.16	0.172	-0.25	-0.278
	(0.33)	(0.333)	(0.55)	(0.550)	(0.65)	(0.644)
High Income	2.65	3.09	3.66	3.64	-6.31	-6.73
	(5.05)	(5.06)	(6.09)	(6.16)	(7.79)	(7.69)
Likelihood of tax cut extensions[a]		16.14*		-3.97		-12.18
		(9.37)		(15.76)		(16.23)
Future Earnings expected to increase[b]		4.49		-4.86		0.365
		(3.95)		(6.58)		(7.96)
Constant	2.31	-5.30	11.96	13.87	85.74**	91.43**
	(17.52)	(18.89)	(31.38)	(30.81)	(35.88)	(36.33)
Joint sig. of Demog vars[c]	0.122	0.144	0.034	0.0372	0.002	0.002
Joint sig. of other vars.[d]		0.0607		0.746		0.755
Mean of Dep Var.	14.31	14.31	37.39	37.39	48.31	48.31
R^2	0.036	0.068	0.061	0.065	0.094	0.098
Observations	154	154	154	154	154	154

The dependent variable is the intended propensity of tax use (consumption, saving, pay down debt) on 0-100 scale.
The table reports the OLS estimates of the dependent variables on row covariates.
Standard errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] The perceived likelihood of tax cut extensions into the future, reported in the first survey (normalized to 0-1 scale).
[b] Dummy that equals 1 if respondent expects year-ahead earnings at the same job to be higher (versus the same, or lower) than current earnings.
[c] p-value for the joint significance of all demographic correlates (age; income; college; male).
[d] p-value for the joint significance of the variables: likelihood of tax cut extensions, and future earnings expected to increase.

Table 7: Correlates of Actual Marginal Propensities of Tax Cut Funds Use

	Consumption		Saving		Pay Down Debt	
	(1)	(2)	(3)	(4)	(5)	(6)
College	8.83	6.74	6.05	4.58	-15.08**	-8.85
	(7.20)	(7.16)	(6.37)	(6.03)	(6.99)	(5.89)
Male	16.23**	12.86*	10.52*	7.20	-26.87***	-15.12**
	(6.85)	(6.68)	(5.91)	(5.69)	(7.41)	(6.69)
Age	0.391	0.441	-0.064	-0.184	-0.329	-0.192
	(0.586)	(0.574)	(0.554)	(0.516)	(0.597)	(0.504)
High Income	8.93	6.94	4.43	1.50	-13.23*	-4.50
	(7.01)	(7.15)	(5.99)	(5.66)	(7.096)	(6.28)
Perceived likelihood of	13.15	11.91	-2.23	-2.68	-11.17	-8.26
tax cut extensions[a]	(15.22)	(14.81)	(13.44)	(13.02)	(15.51)	(12.66)
12-month ahead Earnings	-5.69	-7.78	8.96	10.16	-3.16	-1.87
expected to increase[b]	(7.03)	(6.65)	(6.66)	(6.31)	(7.12)	(5.94)
Intended MP Consume[c]		0.299**				
		(0.122)				
Intended MP Save				0.271***		
				(0.078)		
Intended MP Pay Debt						0.499***
						(0.074)
Constant	-2.31	-5.29	15.08	15.85	87.45***	41.04
	(31.32)	(30.71)	(29.99)	(28.25)	(31.39)	(26.78)
Joint sig. of demog vars[d]	0.014	0.071	0.182	0.667	0.000	0.041
Joint sig. of other vars[e]	0.556	0.420	0.406	0.273	0.707	0.769
Mean of Dep Var	38.77	38.77	25.33	25.33	35.77	35.77
R^2	0.072	0.105	0.069	0.157	0.164	0.397
Observations	154	154	154	154	154	154

The dependent variable is the reported actual propensity of tax use (consumption, saving, pay down debt) on a 0-100 scale.
The table reports OLS estimates of the dependent variables on row covariates. Std errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] The perceived likelihood of tax cut extensions into the future, reported in the first survey (normalized to a 0-1 scale).
[b] Dummy that equals 1 if respondent expects year-ahead earnings at the same job to be higher (versus the same, or lower) than current earnings.
[c] The intended marginal propensity to consume, reported in the first survey (on a 0-100 scale).
[d] p-value for the joint significance of all demographic correlates (age; income; college; male).
[e] p-value for the joint significance of the two variables: likelihood of tax cut extensions, and future earnings expected to increase.

Table 8: Variation in Financial Distress Measures by Demographics

	Job Loss[a]	Earnings Expectations[b] First Survey	Earnings Expectations[b] Sec Survey	Past Credit Access Harder[c]	Expected Future Credit Access Harder[d]	Chance Can Cover Unexp. Expenses[e]	Non-mortgage Debt-to-Inc Ratio	Chance of Declaring Bankruptcy[f]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
College	-1.946	-0.009	0.053	-0.018	-0.003	10.700***	5.259	-3.007***
	(3.272)	(0.072)	(0.079)	(0.038)	(0.033)	(2.621)	(3.818)	(1.105)
Male	1.662	0.104	0.060	0.001	-0.045	5.242**	-2.358	0.113
	(3.143)	(0.068)	(0.072)	(0.037)	(0.033)	(2.587)	(3.767)	(1.091)
Age	0.233	-0.002	-0.008	0.001	-0.002*	0.620***	-0.753***	-0.162***
	(0.229)	(0.006)	(0.006)	(0.001)	(0.001)	(0.091)	(0.134)	(0.039)
High Income	-8.039**	0.109	0.042	0.036	-0.025	17.715***	-21.732***	-3.016***
	(3.233)	(0.070)	(0.076)	(0.038)	(0.033)	(2.652)	(3.862)	(1.118)
Constant	6.234	0.396	0.765**	0.332***	0.393***	21.375***	82.522***	16.446***
	(12.664)	(0.319)	(0.325)	(0.076)	(0.067)	(5.297)	(7.766)	(2.234)
Demog vars sig?[g]	0.116	0.297	0.531	0.731	0.179	0.000	0.000	0.000
R^2	0.042	0.023	0.017	0.003	0.008	0.150	0.078	0.046
Mean	14.88	0.378	0.411	0.408	0.255	69.15	35.57	5.169
Observations	197	209	190	733	741	733	736	733

The table reports the OLS estimates of the dependent variables on row covariates.
Standard errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] Response to the question in the second survey: "What do you think is the percent chance that you will lose your job during the next 12 months?" on a 0-100 scale
[b] Dummy that equals 1 if respondent expects year-ahead earnings at the same job to be higher (versus the same, or lower) than current earnings.
[c] Dummy that equals 1 if respondent says "harder" to: "Do you believe it generally has been easier, harder or equally difficult to obtain credit or loans during the last year when compared to the year before?"
[d] Dummy that equals 1 if respondent says "harder" to: "During the next 12 months, do you expect that it generally will become easier, harder or equally difficult to obtain credit or loans compared to the past 12 months?"
[e] Response to "What is the percent chance (or chances out of 100) that you could come up with $2,000 if an unexpected need arose within the next month?", on a 0-100 scale.
[f] Response to "What is the percent chance that over the next 12 months you [(or your spouse/partner)] will file for bankruptcy?", on a 0-100 scale.
[g] p-value for the joint significance of all demographic correlates (age; income; college; male).

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Table 9: Present-Bias and Shift in Consumption

Dependent Variable: Actual MPC - Intended MPC					
	(1)	(2)	(3)	(4)	(5)
College	-0.205				-0.189
	(8.47)				(8.51)
Male	2.10				4.08
	(7.33)				(7.46)
Age	0.541				0.460
	(0.614)				(0.604)
High Income	1.83				1.93
	(8.37)				(8.19)
Hyperbolic Dummy[a]		-1.86		1.81	2.35
		(7.02)		(8.06)	(7.99)
High Financial Literacy[b]			5.71	24.91	25.73
			(8.36)	(15.71)	(15.79)
Hyperbolic Dum x High Fin Lit.				-30.81*	-31.97*
				(18.18)	(18.34)
Constant	-11.20	19.30***	19.01***	16.58***	-11.56
	(33.55)	(5.35)	(4.070)	(5.45)	(32.03)
Demog variables sig?[c]	0.908				0.914
R^2	0.006	0.001	0.002	0.020	0.026
Mean of Dep. Variable	24.46	23.80	24.46	23.80	23.80
Observations	154	152	154	152	152

OLS regression of the gap between actual MPC and intended MPC onto correlates.
Standard errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] Dummy that equals 1 if the respondent is hyperbolic (see text for construction of variable).
[b] Dummy that equals 1 if respondent has high financial literacy (answers at least 3 of the 4
questions about financial literacy correctly).
[c] p-value for the joint significance of all demographic correlates (age; income;
college; male).

Table 10: Shift in Consumption and State-Level Variation in Economic Indicators

	10th perc, Mean, & 90th p. of row var[a]	Dependent Variable: Actual MPC - Intended MPC[b]							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ(%Δ Earnings)	[-8.8; 5.1; 14.1]	0.160** (0.069)							0.177** (0.068)
Δ(ΔUnemployment Rate)	[-0.8; -0.03; 0.7]		3.18 (4.37)						4.20 (5.26)
Δ(%Δ Payroll Emp.)	[-0.64; -0.14; 0.56]			-4.83 (7.43)					-3.76 (7.56)
Δ(%Δ Home Price Index)	[-1.6; 1.5; 7.4]				2.42*** (0.927)				3.43*** (1.14)
Δ(%Δ Gross State Prod.)	[-3.2; -1.7; 0.26]					1.31 (2.95)			0.766 (2.88)
Δ(Δ Delinquency Rate)	[-5.1; -1.1; 2.4]						-0.723 (0.715)		-1.75** (0.843)
Δ(%Δ Auto Originations)	[-37.9; -19.0; -5.5]							0.085 (0.338)	0.083 (0.335)
Constant		18.87*** (3.82)	19.51*** (3.63)	18.69*** (3.76)	16.01*** (3.74)	21.93*** (5.52)	18.77*** (3.74)	21.38*** (7.03)	14.08 (9.07)
F-test[c]									0.021
R^2		0.024	0.004	0.003	0.031	0.002	0.004	0.001	0.092
Mean of Dependent Var.		24.62	24.13	24.13	24.13	24.13	24.13	24.13	24.62
Number of Observations		141	152	152	152	152	152	152	141

Standard errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] The 10th percentile, mean, and 90th percentile values of the row variable: [10th percentile; mean; 90th percentile].
[b] OLS regression of the gap between actual MPC and intended MPC onto correlates.
[c] p-value for the joint significance of all correlates (excluding constant).

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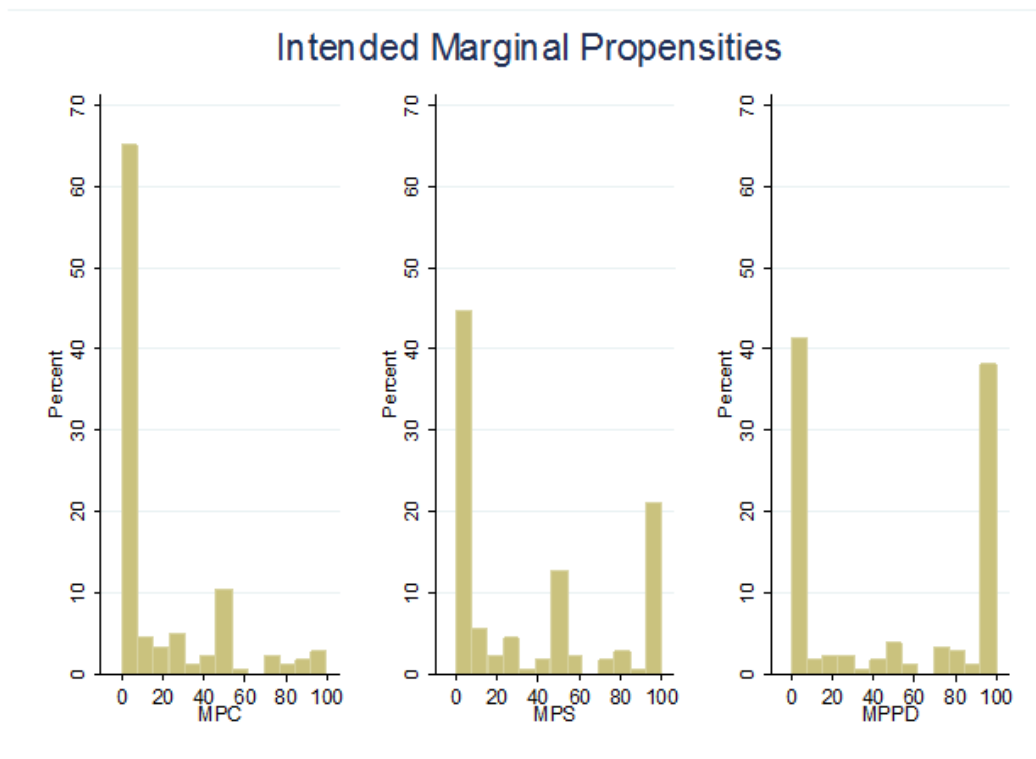# APPENDIX (FOR ONLINE PUBLICATION)

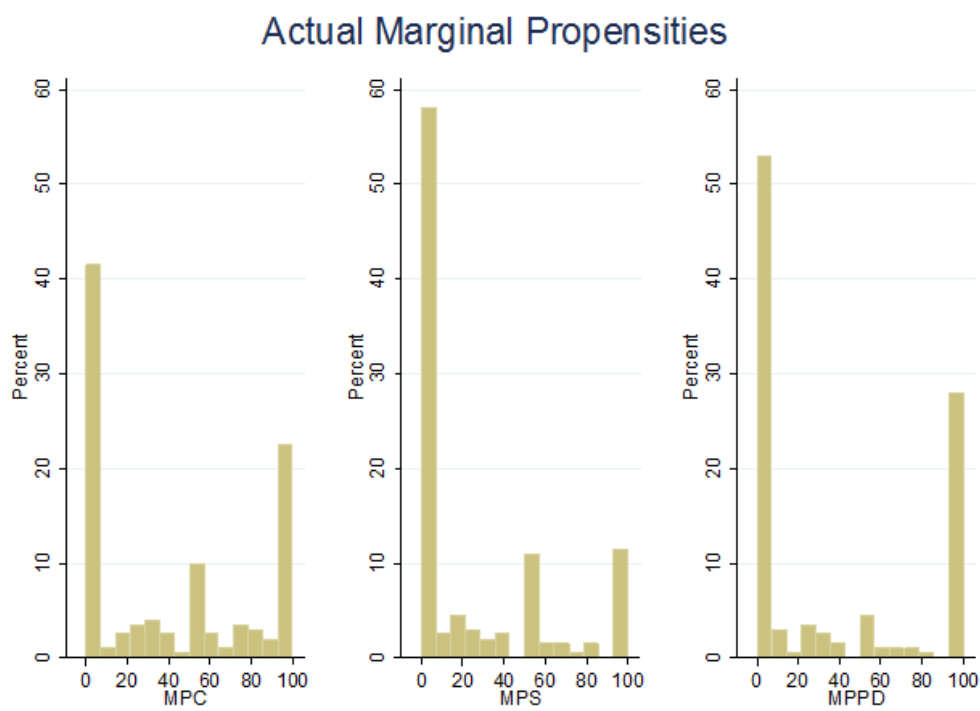Figure A1: Distribution of Intended Marginal Propensities
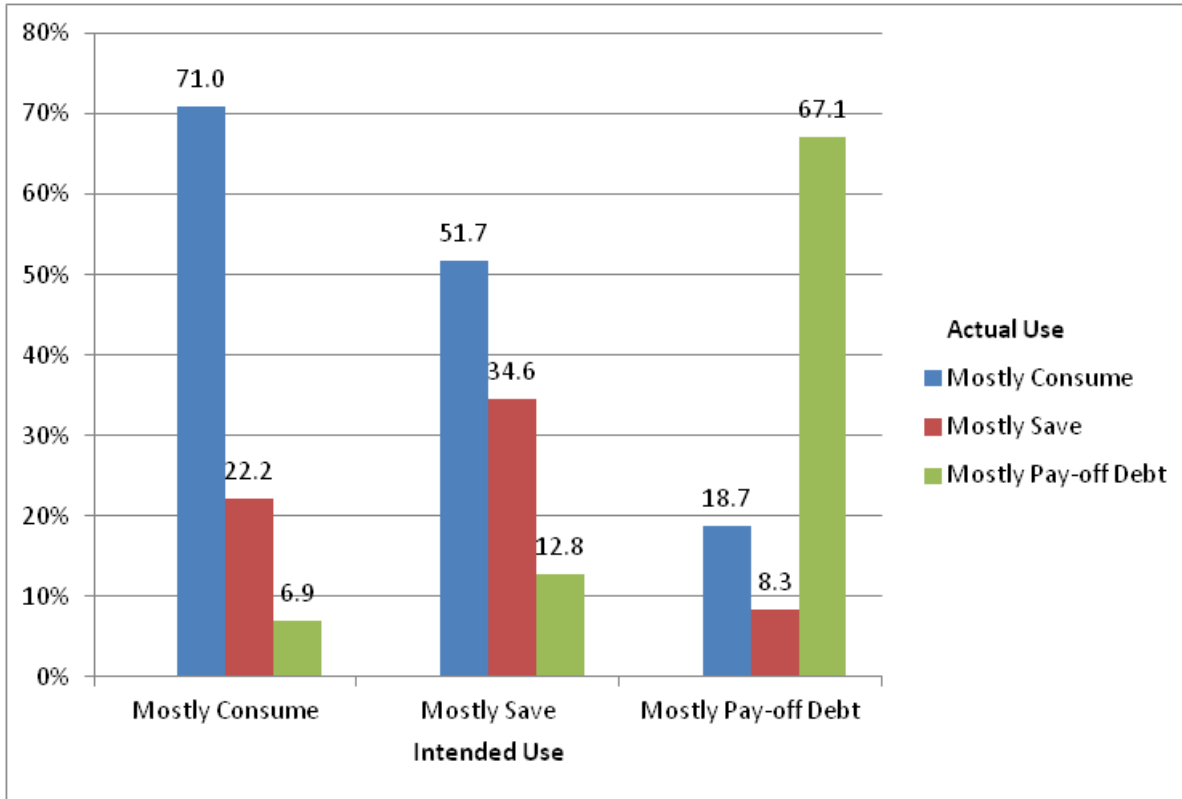

Figure A2: Distribution of Actual Marginal Propensities

Figure A3: Actual use of tax cut funds, conditional on intended use

Table A1: Marginal Propensities of Tax Cuts Use by Demographics (Unweighted)

	All	Male	Female	Age > 54	Age ≤ 54	High Income[a]	Low Income	College	No College
Observations	154	79	75	82	72	77	77	89	65
Intended Response to Payroll Tax Cuts									
Consumption	14.31	17.03	11.44	13.21	15.56	14.71	13.90	15.56	12.58
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
	(24.93)	(28.02)	(21.00)	(23.05)	(27.02)	(27.64)	(22.06)	(25.95)	(23.54)
Saving	37.39	43.48*	30.97	41.13	33.13	43.48*	31.30	43.60**	28.89
	[20.00]	[40.00]	[0.00]	[36.50]	[10.00]	[33.00]	[10.00]	[40.00]	[0.00]
	(41.19)	(42.74)	(38.75)	(42.16)	(39.92)	(43.67)	(37.86)	(41.81)	(39.06)
Pay down debt	48.31	39.49**	57.59	45.66	51.32	41.81	54.81	40.84**	58.52
	[47.50]	[10.00]	[80.00]	[22.50]	[50.00]	[10.00]	[75.00]	[10.00]	[100.00]
	(46.44)	(45.27)	(46.14)	(47.22)	(45.68)	(46.48)	(45.78)	(45.22)	(46.49)
Actual Response to Payroll Tax Cuts									
Consumption	38.77	44.43	32.80	41.32	35.45	43.70	33.57	43.82*	31.85
	[30.00]	[40.00]	[25.00]	[33.00]	[20.00]	[34.00]	[20.00]	[45.00]	[10.00]
	(40.24)	(41.75)	(37.94)	(40.28)	(40.23)	(41.75)	(38.16)	(40.33)	(39.36)
Saving	25.33	29.27	21.19	26.10	24.33	27.35	23.20	28.96	20.37
	[0.00]	[2.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
	(35.05)	(37.92)	(31.47)	(34.45)	(36.05)	(37.43)	(32.47)	(36.86)	(32.02)
Pay down debt	35.77	26.05***	46.01	32.34	40.22	28.95**	42.96	27.00***	47.78
	[0.00]	[0.00]	[34.00]	[0.00]	[0.00]	[0.00]	[33.00]	[0.00]	[50.00]
	(43.66)	(40.53)	(44.75)	(41.54)	(46.21)	(41.85)	(44.65)	(40.93)	(44.71)
Hypothetical Response to Payroll Tax Cut Expiration[b]									
Reduce Consum.	70.05	69.15	71.00	70.20	69.86	72.14	67.85	67.41	73.69
	[100.00]	[100.00]	[100.00]	[100.00]	[90.00]	[100.00]	[95.00]	[100.00]	[100.00]
	(36.37)	(38.78)	(33.87)	(38.08)	(34.24)	(35.78)	(37.09)	(38.49)	(33.18)
Reduce Savings	27.91	30.56	25.12	28.24	27.48	26.63	29.27	31.67	22.75
	[0.00]	[0.00]	[0.00]	[0.00]	[10.00]	[0.00]	[5.00]	[0.00]	[0.00]
	(35.20)	(38.64)	(31.18)	(37.15)	(32.68)	(35.27)	(35.30)	(37.96)	(30.54)
Borrow more	2.01	0.28***	3.83	1.56	2.58	1.22	2.84	0.91**	3.51
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
	(7.85)	(2.26)	(10.75)	(7.43)	(8.38)	(6.25)	(9.21)	(4.90)	(10.50)

Table reports the average propensities (on a 0-100 scale), median in square brackets, and standard deviations in parentheses.
[a] High income is the group of respondents with annual income ≥ $75,000.
[b] Reported propensity of response to expiration of payroll tax cuts.
Wilcoxon rank-sum test conducted for equality of responses for female against male; age > 54 vs. age ≤ 54; high income vs. low income; college vs. no college. ***, **, * denote difference significant at 1, 5, and 10 percent, respectively. Asterisks shown on the female, age > 54, high inc., and college columns, respectively.

Table A2: Hyperbolic Discounting and Tax Cut Use

	Hyperbolic Dummy	Intended Propensity			Actual Propensity		
		Consumption	Saving	Pay Debt	Consumption	Saving	Pay Debt
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
College	-0.099	2.28	10.51*	-12.79*	6.09	4.52	-8.36
	(0.072)	(4.83)	(5.94)	(7.55)	(7.23)	(6.09)	(5.89)
Male	0.092	8.42*	15.09**	-23.51***	13.96**	7.98	-16.58***
	(0.080)	(4.32)	(6.47)	(7.57)	(6.61)	(5.51)	(6.16)
Age	-0.007	0.099	0.123	-0.223	0.357	-0.242	-0.053
	(0.007)	(0.329)	(0.55)	(0.617)	(0.566)	(0.505)	(0.459)
High Income	-0.166**	3.06	1.72	-4.77	6.05	1.48	-4.11
	(0.078)	(5.04)	(6.22)	(7.73)	(7.13)	(5.72)	(6.33)
Perceived likelihood of tax cut extensions[a]		17.12*	-3.25	-13.87	13.88	2.49	-15.21
		(9.66)	(15.75)	(15.83)	(14.54)	(12.92)	(12.27)
12-month ahead Earnings expected to increase[b]		4.50	-6.14	1.64	-7.39	11.26*	-3.77
		(3.97)	(6.46)	(7.79)	(6.65)	(6.03)	(5.499)
Hyperbolic Dummy[c]		-3.76	-11.49*	15.25**	-7.37	-10.76**	15.60***
		(4.09)	(6.45)	(7.46)	(6.90)	(4.78)	(5.72)
High Fin. Literacy Dummy[d]		-0.137	-11.58	11.71	5.17	14.13*	-22.80***
		(4.77)	(8.78)	(10.69)	(8.90)	(7.89)	(8.39)
Intended MP Consume[e]					0.291**		
					(0.122)		
Intended MP Save						0.272***	
						(0.075)	
Intended MP Pay Deb							0.503***
							(0.073)
Constant	0.832**	-3.72	23.83	79.89**	0.429	18.45	34.44
	(0.408)	(18.71)	(31.65)	(35.65)	(30.58)	(27.84)	(25.44)
Joint Sig of Demog variables[f]	0.0794	0.148	0.043	0.003	0.083	0.604	0.039
Joint Sig of expectations vars[g]	-	0.062	0.629	0.666	0.389	0.159	0.413
R^2	0.064	0.074	0.099	0.136	0.113	0.188	0.445
Mean of Dep Var	0.355	14.49	37.88	47.63	38.29	25.66	35.91
Observations	152	152	152	152	152	152	152

The dependent variable in column (1) is a dummy that equals 1 if the respondent is hyperbolic (see text for definition).
The dep. variable in columns (2)-(7) is the propensity of tax use (consumption, saving, pay down debt) on a 0-100 scale.
The table reports the OLS estimates of the dependent variables on row covariates.
Standard errors in parentheses. ***, **, * denote significance at 1, 5, and 10%, respectively.
[a] The perceived likelihood of tax cut extensions into the future, reported in the first survey (normalized to a 0-1 scale).
[b] Dummy that equals 1 if respondent expects year-ahead earnings at the same job to be higher than current earnings.
[c] Dummy that equals 1 if the respondent is hyperbolic (see text for construction of variable).
[d] Dummy that equals 1 if respondent has high financial literacy (answers at least 3 of the 4 fin literacy questions correctly).
[e] The intended marginal propensity to consume, reported in the first survey (on a 0-100 scale).
[f] p-value for the joint significance of all demographic correlates (age; income; college; male).
[g] p-value for the joint significance of the two vars (likelihood of tax cut extensions; future earnings expected to increase).

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Table A3: Response to Expiration of Payroll Tax Cuts, by Demographics

	All	Male	Female	Age > 54	Age ≤ 54	High Inc[a]	Low Inc	College	No College
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Marginal Propensities:									
Observations	154	79	75	82	72	77	77	89	65
Reduce consumption	71.36	71.73	70.97	72.77	70.27	71.25	71.45	66.50	74.15
	(3.44)	(5.57)	(3.92)	(4.53)	(5.09)	(5.62)	(4.30)	(6.48)	(3.92)
Reduce savings	26.09	28.14	23.94	25.27	26.73	26.59	25.73	32.66	22.33
	(3.30)	(5.57)	(3.40)	(4.28)	(4.91)	(5.55)	(4.02)	(6.43)	(3.66)
Increase debt	2.37	0.13***	4.74	1.96	2.69	1.76	2.83	0.84**	3.25
	(0.71)	(0.11)	(1.46)	(1.07)	(0.97)	(0.90)	(1.04)	(0.45)	(1.09)
Panel B: Mostly:									
Observations	119	64	55	69	50	61	58	70	49
Reduce consumption	0.79	0.79	0.80	0.78	0.81	0.80	0.79	0.70*	0.85
Reduce savings	0.19	0.21	0.17	0.20	0.19	0.20	0.19	0.30*	0.13
Borrow More	0.01	0.00	0.02	0.03	0.00	0.00	0.02	0.00	0.02
Chi-Square Test			0.461		0.421		0.650		0.112

Table reports the average propensities (on a 0-100 scale). Standard deviations in parentheses.

[a] High income is the group of respondents with annual income ≥ $75,000.

For Panel A: Adjusted Wald t-test conducted for equality of responses for female against male; age > 54 vs. age ≤ 54; high income vs. low income; college vs. no college. ***, **, * denote difference significant at 1, 5, and 10 percent, respectively.

For Panel B: Chi-square test conducted for equality of proportions for females and males; age > 54 and age ≤ 54; high income and low income; college and no college. ***, **, * denote difference significant at 1, 5, and 10 percent, respectively.

A   Measuring Present Bias

Individuals were asked to make 6 choices in which they had to choose how to allocate $500 between 2 checks under the following time frames and interest rates (r):

Choice	Date of 1st Check	Date of 2nd Check	r
A1	Today	In 1 Month	0.5%
A2	Today	In 1 Month	1%
A3	Today	In 1 Month	2.5%
B1	In 1 Year	In 1 Year and 1 Month	0.5%
B2	In 1 Year	In 1 Year and 1 Month	1%
B3	In 1 Year	In 1 Year and 1 Month	2.5%

For each choice, the respondent has to decide how much to save for the 2nd check (which equals 500 minus the amount for the first check).

According to Andreoni and Sprenger (forthcoming), a respondent is characterized as being present-biased if, for a given r, the amount allocated to the 2nd check for the choice close in time (choice A) is smaller than the amount allocated to the 2nd check for the choice farther in time (corresponding choice B). For example, if r = 1%, then if the amount allocated to the 2nd check in A2 is smaller than the amount allocated to the 2nd check in B2, the respondent is present biased.

Since we have three different interest rates, a respondent may possibly be present-biased as many as three times. Giné et al. (2012) count the number of times the individual is present-biased. Our results are qualitatively similar whether we use a binary indicator for the respondent ever being present-biased (which is what we use in the analysis reported in the paper), or the variable that counts the number of times the respondent is present-biased.

B   Response to Expiration of Payroll Tax Cuts

The 2011 payroll tax cut has been extended twice, once in December 2011 for the first two months of 2012, and then again in February 2012 for the rest of the year. However, both major political parties seem to be converging to the agreement to quietly let the tax cuts expire at the end of this year (Bendavid, 2012).

From a policy perspective, it is then useful to know how workers would respond to the expiration of the payroll tax cuts. In the second survey, we asked respondents: *"If the tax rate cut is not extended, the FICA tax rate will increase by 2% in January 2012. What do you plan to do to cover the increase in taxes and reduction in your take-home pay?"*. More specifically, respondents were asked for the share of the lost income they would make up by (i) cutting spending/consumption, (ii) reducing savings, and (iii) increasing borrowing. Note that this question, asked in December 2011, elicits workers' response to the potential expiration of

the tax cuts at the end of 2011. However, these responses may still be informative about how workers would react to the potential expiration of the cuts later in 2012.

The top panel of Table A3 reports the marginal propensities for reducing consumption, decreasing savings, and increasing debt under the hypothetical scenario where the payroll tax cut expires. We see that, on average, workers plan to largely cut down spending. They plan to reduce consumption by 71.4 percent of the amount of the tax cut, followed by a reduction in savings of 26.1 percent of the size of the tax cuts, and an increase in debt of 2.4 percent of the tax cut amount. This is in sharp contrast to the actual reported use of the tax cut funds (Panel B of Table 3). While the amount by which workers plan to cut down their savings is very similar to their actual marginal propensity of savings (24 percent), the planned response to changes in consumption and debt under this hypothetical scenario are not in line with how the tax cuts actually affected the two in the first place. Respondents consumed only about 36 percent of the cuts, but plan to cut down their consumption by twice that amount if the cuts expire. Similarly, while 40 percent of the funds were used for debt servicing, respondents expect to increase debt by only 2.4 percent of the size of the tax cut. This incongruity in responses is likely a consequence of households being highly indebted with debt leading up to the Great Recession, and a greater push by them to deleverage since then (Chakrabarti et al., 2011).

One interesting feature of Table A3 is the lack of heterogeneity in response to the expiration of the tax cuts by demographics. Looking across the columns, the propensity of cutting down consumption for the various groups lies in a small range, varying between 66.5 and 74.2 percent of the size of the tax cut. Similarly there is little demographic variation in how much respondents plan to reduce savings by. This may be somewhat surprising given that the actual tax cut uses varied quite a bit across the groups, but is not implausible in a regime of tightening credit conditions and deleveraging by households.

As was done in Table 4, the lower panel of Table A3 translates the proportions allocated to each of the categories into "most" uses, excluding those who were "split" between two usage categories and those who did not assign a propensity of at least 50 to any category. A similar picture to the one seen in Panel A emerges. Under the scenario that the cuts are not extended, 79 percent of the respondents report that they will mostly reduce consumption, 19 percent report they will mostly reduce savings, and 1 percent report they will increase debt. When compared to the statistics in Table 4, we again see that the intended response to the expiration of the tax cuts is not in line with the actual most-use.

Overall, while the tax cuts led workers to mostly pay off debt followed by increasing consumption, Table A3 suggests that the expiration of the payroll tax cuts would lead workers, across all demographic groups, to disproportionately reduce consumption with little change in debt balances. It should, however, be noted that how workers plan to respond to a hypothetical situation may be different from what they actually do when confronted with that situation.

Above, we have shown that, while there was a strong correlation between intended and actual response to the payroll tax cuts, there was a systematic gap between the two. Answering about planned behavior in a hypothetical situation may be even more challenging for respondents since it requires them to put themselves in a counterfactual situation which they have not faced (as of yet).[35]

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[35]Recall that our sample respondents were asked about their intended use of the payroll tax cut funds over the period February-March 2011, that is, after the payroll tax cut had actually been implemented.