

NBER WORKING PAPER SERIES

CHECK IN THE MAIL OR MORE IN THE PAYCHECK:  
DOES THE EFFECTIVENESS OF FISCAL STIMULUS DEPEND ON HOW IT IS DELIVERED?

Claudia R. Sahm  
Matthew D. Shapiro  
Joel B. Slemrod

Working Paper 16246  
<http://www.nber.org/papers/w16246>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
July 2010

The views expressed herein are those of the authors and not necessarily those of the Federal Reserve Board or the National Bureau of Economic Research. The authors are grateful for comments from Anil Kumar, David Lebow, and Andre Mander, and seminar participants at the Federal Reserve Board, the Federal Reserve Bank of Boston, and the NBER Summer Institute. The Federal Reserve Board supported the data collection for this project.

© 2010 by Claudia R. Sahm, Matthew D. Shapiro, and Joel B. Slemrod. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Check in the Mail or More in the Paycheck: Does the Effectiveness of Fiscal Stimulus Depend on How It Is Delivered?

Claudia R. Sahm, Matthew D. Shapiro, and Joel B. Slemrod

NBER Working Paper No. 16246

July 2010

JEL No. C83,E62,H31

**ABSTRACT**

Recent fiscal policies have aimed to stimulate household spending. In 2008, most households received one-time economic stimulus payments. In 2009, most working households received the Making Work Pay tax credit in the form of reduced withholding; other households, mainly retirees, received one-time payments. This paper quantifies the spending response to these different policies and examines whether the spending response differed according to whether the stimulus was delivered as a one-time payment or as a flow of payments in the form of reduced withholding. Based on responses from a representative sample of households in the Thomson Reuters/University of Michigan Surveys of Consumers, the paper finds that the reduction in withholding led to a substantially lower rate of spending than the one-time payments. Specifically, 25 percent of households reported that the one-time economic stimulus payment in 2008 led them to mostly increase their spending while only 13 percent reported that the extra pay from the lower withholding in 2009 led them to mostly increase their spending. The paper uses several approaches to isolate the effect of the delivery mechanism from the changing aggregate and individual conditions. Responses to a hypothetical stimulus in 2009, examination of “free responses” concerning differing responses to the policies, and regression analysis controlling for individual economic conditions and demographics all support the primary importance of the income delivery mechanism in determining the spending response to the policies.

Claudia R. Sahm  
Federal Reserve Board  
21st and C Street NW  
Washington DC 20551  
Claudia.R.Sahm@frb.gov

Joel B. Slemrod  
University of Michigan Business School  
Room R5396  
Ann Arbor, MI 48109-1234  
and NBER  
jslemrod@umich.edu

Matthew D. Shapiro  
Department of Economics  
University of Michigan  
611 Tappan St  
Ann Arbor, MI 48109-1220  
and NBER  
shapiro@umich.edu

## I. Introduction

Fiscal stimulus during economic downturns has been a prominent feature of economic policy in the first decade of the new millennium. Payments to households by different mechanisms have been central to these stimulus policies. In 2001, households received a tax rebate paid by paper check. In 2008, households received economic stimulus payments in the form of a paper check or electronic funds transfer. In 2009, working households had a reduction in income tax withholding corresponding to a tax credit; retiree households received a one-time payment. When the economic stimulus package was being considered in early 2009, economists and policymakers pondered whether a reduction in withholding would deliver more immediate spending. Although the delivery mechanism is immaterial in a standard economic model with rational and unconstrained consumers, it might matter if, for example, many households follow rules of thumb or use mental accounts, if the awareness of a change in after-tax income depends on how it is delivered, or if the delivery mechanism affects expectations about future tax cuts or increases.

In this paper we examine evidence designed to answer the question of whether the delivery mechanism of stimulus payments affects whether the payments are spent or saved. The surveys measure household spending responses to actual and hypothetical fiscal stimulus packages in 2008 and 2009. Their design allows us to focus on households whose spending responses differ across delivery mechanism. By simultaneously asking about a series of actual and hypothetical policies, we can distinguish the effect of delivery mechanism from changes in aggregate and individual economic conditions across time. We also analyze open-ended, free responses to provide greater resolution on why people respond differently depending on how an increase in disposable income is delivered.

We find that the average propensity to spend out of an increase in after-tax income was *lower* for reductions in withholding—barely half as much—than for one-time payments. Just 13 percent of households said that the 2009 tax credit would lead them to mostly increase their spending—roughly half of the mostly-spend rate of 25 percent for the 2008 tax rebates. The fact that the spend rates for the tax rebates in 2008 and hypothetical and actual one-time payments in 2009 are similar provides further evidence on the importance of the delivery mechanism. Tabulations of additional survey questions, regression analysis with earlier surveys, and

qualitative analysis of the free-response questions all confirm a smaller stimulative effect from a change in withholding compared to a one-time payment.

The remainder of the paper is organized as follows. Section II discusses the design of stimulus policies that provide extra income to households and why the delivery mechanism for the extra income might matter for behavior. Section III describes the survey. Section IV presents results. Section V offers a concluding discussion of how these results inform debates over the design of fiscal policies.

## **II. Mechanism of Payment and the Design of Policies**

### *A. The Stimulus Policies*

The policies underlying the rebates and credits in 2001, 2008, and 2009 were quite different. The 2001 rebate was an “advanced payment” of the benefit of a new 10 percent tax bracket for a portion of taxable income that was previously taxed at 15 percent. The 2001 tax cut legislation instituted the 10 percent bracket for 10 years (2001 to 2010). The intention of its supporters was that it would later be made permanent, and indeed, President Obama has proposed doing so in his FY 2011 budget. The 2008 rebate was a one-time “stimulus payment.” Though administered through the tax system, the rebate was not related to any change in tax policy. The 2009 change in withholding resulted from the enactment of the Making Work Pay tax credit, which for most workers effectively provided a lump-sum income tax credit. The credit was enacted for 2009 and 2010 as part of the 2009 stimulus package. In 2009, the expressed intention of the Obama administration was that it should be made permanent by future legislation. The FY 2011 budget proposes extending the credit for one year.

Hence, the payments in 2001, 2008, and 2009 differed substantially in how they related to tax liabilities over time. The 2001 and 2009 policies are somewhat comparable because they related to income tax. Moreover, for most workers the tax liability changes associated with the rebate in 2001 and the change in withholding in 2009 were lump sum, i.e., did not change a marginal tax rate.<sup>1</sup> The 2008 stimulus was a one-time payment unrelated to tax liabilities. While the Making Work Pay tax credit applied only to workers, the stimulus package in 2009 also

---

<sup>1</sup> Most taxpayers have incomes that put them above the 10% bracket (\$12,000 for couples), so the benefit of the 10% bracket is a fixed dollar amount, so the 2001 advanced payment is a lump sum. Similarly, most taxpayers have at least the amount of earnings (\$12,900 for couples) for which the credit reaches its limit, and less than the amount where the phase out begins (\$150,000 for couples), so the 2009 Making Work Pay tax credit is also a lump sum.

provided one-time payments to certain non-workers, for example, retirees living on Social Security. Hence, the stimulus packages in 2008 and 2009 provide an opportunity for comparing the one-time payments with changes in withholding.

The mechanism for the delivery of fiscal stimulus is part of the design of the policy. At different times, policymakers use changes in withholding or one-time payments to distribute the stimulus. In 2008, policymakers chose an economic stimulus through the mechanism of a one-time, highly visible payment. The 2008 stimulus payment was designed to provide rapid stimulus in tandem with the sharp cuts in interest rates by the Federal Open Market Committee in order to head off a recession (see Economic Report of the President 2009, Box 1-1). Moreover, the 2008 stimulus payments were not closely linked to the tax system, except administratively, so it was much more natural to disburse them as a rebate than as a change in withholding.<sup>2</sup>

In 2009, the situation was quite different as policymakers chose to disburse gradually the stimulus through a much less visible change in withholding. In contrast to the notion that the 2008 rebate would “jump-start” an economy teetering on the edge of falling into recession, the 2009 tax credit was part of a policy of extended fiscal stimulus in the face of a severe and likely protracted downturn. The 2009 stimulus was designed as a two-year package. The Making Work Pay tax credit was integrated into the tax system. Hence, it was natural to implement it as a change in withholding. The chair of the Council of Economic Advisers (CEA), Christina Romer, (2009) and the Economic Report of the President (2010, p. 52) make explicit the aim of spreading the stimulus over several years.

---

<sup>2</sup> As mentioned, the 2001 tax rebates corresponded to an advance payment of the benefit of a new, 10 percent tax bracket for the first \$12,000 of taxable income (\$6,000 for singles) for a portion of taxable income that was previously taxed at 15 percent. It would have been straightforward to implement this change in tax rates as a change in withholding. Indeed, the cuts in the marginal tax rates that applied to the upper tax brackets were in fact implemented as a change in the withholding tables effective July, 2001. Instead, the benefit of the 10 percent bracket in 2001 was distributed as a rebate; the withholding tables were adjusted for the new 10 percent bracket as of January, 2002. Hence, policymakers made an explicit choice to use the rebate mechanism in 2001. The 2001 rebate was part of a significant change in tax rates that was proposed by the Bush Administration before the recession for reasons not related to economic stimulus. As the tax changes worked through Congress, it became clearer that the economy was slowing, so the idea of the rebate was introduced to provide a visible short-term stimulus as a part of the longer-term change in tax policy. The Economic Report of the President, issued early in 2002, does not distinguish between the rebates and the much smaller in aggregate changes in withholding. “The timing of these reductions in withholding and rebates proved propitious: They added substantial economic stimulus by boosting purchasing power in the hands of consumers during a period of sluggish economic activity” (Economic Report of the President 2002, p.44) See Shapiro and Slemrod (2003b) for further discussion of the CEA analysis of the 2001 rebate.

## B. Why Might the Delivery Mechanism Affect Spending?

While the form of the 2009 stimulus was being debated, some economists and commentators suggested that households were more likely to spend from a small increase in take-home pay than a lump-sum rebate. In this subsection, we discuss possible reasons to think that the delivery mechanism might matter.

Mental accounts. Richard Thaler's formulation of the role of mental accounts figured prominently in the discussion of the likely effects of the 2009 tax credit. Thaler (1992, p. 109) describes three broad accounts for wealth—a current income account, an asset account, and a future income account—and argues that the marginal propensity to consume (MPC) out of the first account is close to one, the MPC from the last account is close to zero, and the MPC from the middle account is somewhere in between. Also according to Thaler (1992, p. 112), “small gains, relative to income, will be coded as current income, and spent. Larger gains will enter the assets account, where the MPC is lower.” If, as seems reasonable, reduced withholding is put into a “current income account,” the mental account framework would suggest a higher spend rate from it compared to a one-time check that is more likely to be put into an “asset account.”<sup>3</sup>

This prediction of the mental accounting framework was taken to suggest that the 2009 change in withholding would be more effective than a rebate at stimulating spending.

Psychologist Barry Schwartz put it as follows:

We can apply the lessons of mental accounting to the stimulus package. Perhaps a major reason why the Bush tax rebate failed to stimulate spending was that it came as a lump sum. Paid all at once, a rebate of \$500 is real money.... But suppose, instead, it had been paid as a \$10/week addition to your regular paycheck? Then, it would hardly be noticeable. One more latte at Starbucks. Steak instead of chicken at the restaurant. The ten bucks would just get absorbed into your weekly wage. You'd live a little better, and your money would go a little further, without you giving it a moment's thought. What this implies is that if the stimulus package includes tax relief, and if we want people to spend the money they get, we should make sure that the money comes in 'spendable' packages. Not as a lump sum, but as dribs and drabs.<sup>4</sup>

---

<sup>3</sup> The prediction of the mental accounts framework is supported by lab experiments reported in Chambers and Spencer (2008) using student subjects, who report that refunds delivered as monthly payments stimulated current spending more than if the same yearly total tax reduction was delivered in one lump sum. The lab experiments of Epley, Mak, and Idson (2006) suggest that the framing of a stimulus payment may affect the spending response. In a series of experiments, they find that income received either from the U.S. government or from a laboratory fund was saved more readily when it was described as *returned* income compared to when it was described as *bonus* income.

<sup>4</sup> Barry Schwartz, “On the Economic Stimulus Package: The ‘Packaging’ Counts” (February 1, 2009) <http://www.psychologytoday.com/blog/the-choices-worth-having/200902/the-economic-stimulus-package-the-packaging-counts>.

James Surowiecki, writing in the *New Yorker* magazine, made a similar argument, which was endorsed by Cass Sunstein and Thaler in their blog.<sup>5</sup>

Visibility. One reason that the delivery mechanism of a stimulus payment may matter for the induced spending response is that different mechanisms have different visibility. There are multiple dimensions to visibility. Most directly, a one-time rebate is, by definition, something unusual.<sup>6</sup> How a one-time payment arrives (as a check or as an electronic funds transfer (EFT)) may matter, as well. While one could be passive about an EFT, one has to take notice of a check by depositing it. In contrast, a change in withholding is simply an adjustment by one's employer of a recurring, periodic flow. It might not be noticed, especially for individuals whose paycheck routinely fluctuates for other reasons (changes in hours, changes in deductions for benefits or other payroll deductions, etc.). Additionally, the stimulus measures had different levels of publicity. The 2008 rebate checks were the main feature of the 2008 stimulus package and received substantial press attention. Moreover, rebate recipients received a letter informing them of the rebate. In contrast, the 2009 withholding change, although a significant part of the stimulus package, was one of many components and received relatively less press attention. In particular, no letter was sent informing recipients of the Making Work Pay tax credit.

While these behavioral arguments might have been part of the Administration's thinking in designing the stimulus, we have not been able to locate any contemporaneous official discussion of the effect of the mechanism for the payment. The Administration's analysis instead rested on the assumption that the spending from the tax cut would be consistent with

---

<sup>5</sup> James Surowiecki, "A Smarter Stimulus" *New Yorker* (January 26, 2009); Sunstein and Thaler, "How Behavioral Economics Could Show Up in the New Stimulus Package" (January 20, 2009), <http://nudges.org/2009/01/20/how-behavioral-economics-could-show-up-in-the-new-stimulus-package>.

<sup>6</sup> While the rebates we study are one-time, some similar government payments are recurring. For example, residents of Alaska get annual payments deriving from the royalties on North Sea oil. Hsieh (2003) finds evidence that households in Alaska smooth these payments, and thus do not alter their spending at the time of receipt. In contrast, the same households display excess sensitivity of spending to income tax refunds. Hsieh concludes that for households to incorporate anticipated income changes into their consumption paths, these income changes must be large and transparent. Parker (1999) examines whether consumer spending changes when take-home pay increases in months after wage earners after-tax paycheck goes up because they hit the earnings ceiling for Social Security payroll taxes. He finds there is a correlation between take-home pay and expenditure, and he argues that the evidence suggests the reason is myopia or rule-of-thumb behavior rather than liquidity constraints. In a study of the spending impact of large, recurring non-government obligations, Souleles (2000) finds that large, predictable tuition payments have little impact on the timing of parents' non-tuition expenditures.

consumers treating it as permanent.<sup>7</sup> Observationally, this has the same implication as the mental accounting framework.

We are agnostic about the behavioral responses to changes in withholding versus rebates. The purpose of this paper is to provide direct evidence on this question—one that has importance for the design of fiscal policies. Our survey approach will shed light on whether the mechanism for distributing fiscal stimulus matters. It will also provide direct evidence about whether households’ awareness of the policy change matters for their behavior. In the next section, we describe the survey methodology.

### III. Survey Methodology

In this study we analyze the answers to questions in the Thomson Reuters/University of Michigan Surveys of Consumers regarding the spending response of households to the fiscal stimulus measures in 2008 and 2009 and to hypothetical alternative stimulus measures.<sup>8</sup> We have previously applied this methodology to studying similar policy interventions that put extra disposable income in the hands of households with the aim of providing a short-run stimulus to economic activity.<sup>9</sup> In May and July of 2009 we asked households the following<sup>10</sup>:

Under this year’s economic stimulus program, most workers will receive an income tax credit. The tax credit will, in most cases, be four hundred dollars to eight hundred dollars per household this year and next. The tax credit will reduce the amount of taxes withheld from paychecks. As a result, take-home pay may increase as much as sixty-seven dollars per month for married workers or forty-four dollars per month for single workers.

Thinking about your (family’s) financial situation this year, will this income tax credit lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

---

<sup>7</sup> In a speech, CEA Chair Christina Romer stated, “In estimating the effects of the recovery package, Jared Bernstein and I used tax and spending multipliers from very conventional macroeconomic models. We used simulations based on the realistic assumption that monetary policy would remain loose, and on the assumption that people would treat the individual tax cut as permanent. This last assumption is justified by the fact that the President ran on a permanent middle class tax cut and just included it in his budget.” *The Case for Fiscal Stimulus: The Likely Effects of the American Recovery and Reinvestment Act* (New York City, February 27, 2009).

<sup>8</sup> The survey is a nationally representative monthly survey based on about 500 telephone interviews. Individuals who are selected for the survey are interviewed twice, six months apart. In any month about 60 percent of the respondents are first-time interviewees and about 40 percent are second-time interviewees.

<sup>9</sup> See Shapiro and Slemrod (1995, 2003a, 2003b, 2009) and Sahm, Shapiro, and Slemrod (2010). The “thinking about your family’s financial situation this year” formulation is designed to capture the spending from the extra income over a year rather than focusing on the immediate disposition of extra income.

<sup>10</sup> See the appendix for the complete survey instrument.

The format of this question closely followed the question asked previously in the Surveys of Consumers about the response to the 2008 tax rebates, which were distributed as a one-time payment. While our analysis will draw on those previous responses during 2008, we also asked the respondents in 2009 retrospectively about their response to the 2008 tax rebates, using the following wording:

Under last year's economic stimulus program, many households received tax rebates that amounted to six hundred dollars for individuals and twelve hundred dollars for married couples. Those with dependent children received an additional three hundred dollars per child. The tax rebates were paid by check or direct deposit. Did you (or your family) receive a tax rebate last year?

For those households who answer yes, we then asked:

Did last year's tax rebate lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

The 2009 survey also inquired about various aspects of the change in withholding, including whether their (or their spouse's) employer had already lowered the amount of withholding, whether they had heard previously about the 2009 tax credit and whether they expected the tax credit to be extended.

A central question addressed by our research is whether a stimulus distributed gradually in the form of lower withholding elicits a different spending response than a stimulus distributed as a one-time payment. Simple comparisons between the consumer response to the change in withholding in 2009 and the one-time tax rebate in 2008 may be complicated by the deterioration in economic conditions between the two stimulus measures. To address this possibility, we also examine the reported response to the one-time stimulus payment to retirees and other beneficiaries in 2009. Because only a modest fraction of the survey respondents were eligible for this retiree payment and because retirees might have systematically different responses, we also asked the non-recipients about a hypothetical payment of the same magnitude. Finally, we ask those individuals who reported different spending responses to a change in withholding and a one-time payment to explain, in a free-response format, the reason for the difference. Their explanations provide additional context for the tabular and econometric results on the importance of the delivery mechanism.

## IV. Results

### A. Tabular Results

Table 1 summarizes our main finding that the spending response to the 2009 change in withholding was considerably weaker than to the 2008 tax rebates. The first row shows, for the alternate delivery mechanisms of stimulus payments, the percent of recipients who reported that the extra income would mostly lead them to mostly increase spending, which we henceforth refer to as the “spend rate.” The spend rate is just 13 percent for the 2009 tax credit that was implemented through lower withholding—roughly half of the spend rate of 25 percent for the 2008 tax rebates.

Of course, this finding raises the question of *why* the household response to the two stimulus programs differed. As we discuss later, our results suggest that the most important difference was whether households received the additional income in a single, large payment or in small amounts spread evenly over several paychecks. We investigate other possibilities, including demographic differences in the recipients of the two stimulus programs and changes in the macroeconomic environment. In what follows, we first present tabulations of the additional survey responses, before turning to multivariate econometric analysis and the free responses.

One noteworthy feature of the data is that most respondents in May and July of 2009 are unaware that the change in their withholding had already occurred. The \$44 per month change in withholding for single and the \$67 change in withholding for married workers mentioned in the survey question reflect the actual changes workers should have seen in their paychecks based on the new withholding tables issued by the Internal Revenue Service.<sup>11</sup> The new withholding tables were issued effective March 1, 2009, with the changes mandatory as of April 1, 2009. Even though employers were required to adopt the new schedules for payroll tax withholding by April 1, 2009, table 2 shows that the majority of respondents surveyed in May and July said “no” or “don’t know” to the following question:<sup>12</sup>

---

<sup>11</sup> Note the asymmetry between the treatment of singles and married workers. For singles, \$44 per month times 9 months equals the annual value of the tax credit of \$400. For married workers, \$67 per month times 9 months is \$600, less than the \$800 value of the tax credit. Evidently, the IRS was hedging against the possibility of under-withholding in the event of two-earner couples. Under the credit, couples receive a credit of at most \$800 regardless of whether they have one or two incomes.

<sup>12</sup> Six percent of respondents volunteered that they were self-employed and therefore not subject to withholding.

Has your employer (or your spouse's employer) already reduced your tax withholding and increased your take-home pay?

There is little direct evidence about the extent to which firms complied with the change in withholding. There is a downward shift in current personal tax payments reported in the monthly personal income statistics (see Personal Income and Outlays release, April 2009). Although the Bureau of Economic Analysis adjusted the data to reflect its best estimate of the effect on personal tax payments of the change in withholding, it does not have independent data on withholding when it makes its monthly estimate of personal income. Hence, although the monthly data on personal income and taxes do reflect a reasonable estimate of the effect of the change in the withholding formulas, they do not provide evidence on the extent to which businesses complied with the change in the withholding tables.<sup>13</sup>

We also note that there was much less publicity for the 2009 change in withholding than for the 2008 stimulus payments.

- The 2008 stimulus payments were the major feature of the 2008 stimulus program, while the 2009 Making Work Pay tax credit was one of many components of the 2009 stimulus program.
- In 2008, households received at least two letters about the stimulus payments. In 2009, there was no such official notification about the withholding change.

In any case, the apparently widespread lack of awareness of the change in withholding is a significant finding.

Moreover, one might expect awareness of the withholding change to increase over time, but the percent of respondents in July 2009 who report a change in withholding is actually lower than in May 2009, although the difference is not statistically significant.

We can investigate the effect of the awareness of the change in withholding using the survey. Notably, it does not have much effect on the response of households to the additional income. The top panel of table 3 compares the spend rates of respondents who reported being aware of a change in withholding with the spend rates of those who reported no change or not did not know whether their withholding had changed. (Individuals who volunteer that they are self-employed are not included in this particular tabulation.) The spend rate is actually 5

---

<sup>13</sup> There are monthly source data on consumption (e.g., from retail sales data), so the monthly income and consumption releases do potentially shed light on the spending from changes in taxes.

percentage points *lower* for those individuals who said that employer withholding had already changed, although this difference is not statistically different from zero (at the 5 percent level). In contrast, the middle panel shows that, among the nearly two-thirds of respondents (asked only in July) who had previously heard about the 2009 tax credit, the spend rate is 6 percentage points higher, although again the difference is not significant. Those respondents who had heard previously about the tax credit are significantly more likely to report that their employer had already lowered their withholding.

The spending responses of households also did not differ by whether the household believed that the lower withholding represented a permanent or temporary change in taxes—a pattern at odds with the permanent income hypothesis. While the 2009 Making Work Pay tax credit as enacted was to last for only two years, it had been a key feature of the President’s campaign and many speculated that it would extend past 2011. As reported in the bottom panel of table 3, households are fairly evenly split as to whether they thought the tax credit would be extended. However, the mostly-spend rates are nearly identical across the two groups, whereas the permanent income hypothesis would have predicted a larger spending response from those households who expected an extension.

One might be concerned that the lower spend rate from the 2009 tax credit compared to the 2008 tax rebate could reflect that households simply had had less time to adjust their spending at the time of the 2009 survey. Comparisons with earlier surveys, as shown in table 4, do suggest that the reported spend rate out of the rebate increases with the elapsed time between the stimulus payment and the survey question. In the spring of 2008, as households were receiving their rebates, 19 percent of households thought that the payments would mostly lead to an increase in their spending. A year later, the fraction reporting that the rebate was mostly spent is 6 percentage points higher. This suggests that the prospective reports on spending out of the lower withholding in mid-2009 could understate the actual spending from this stimulus program; however, this is unlikely to explain the entire difference in spend rates between the rebates and the change in withholding. Our econometric analysis in the next section will use the variation over time in the rebate spending responses to identify this effect.

Demographic factors could also help explain the differences in the aggregate spend rates. As table 5 shows, the change in withholding, which only affected workers, was targeted at

younger and higher-income households relative to the tax rebate.<sup>14</sup> While the households with the lower withholding were more likely to report being better off financially than a year ago, a comparable majority of both groups reported being worse off.<sup>15</sup>

One straightforward way to exclude the effects of different recipient characteristics is to focus only on the individuals who benefited from both policies. About 80 percent of the households who received the tax credit in 2009 also received the tax rebate in 2008. Table 6 summarizes the responses for these individuals who were affected by both policies. A comparison with table 1, which covers all respondents, reveals very small differences in the aggregate spend rates for the two stimulus programs. In particular, the fraction of households who plan to mostly spend the lower withholding remains more than 10 percentage points below the fraction that mostly spent the rebates. This finding suggests that differences in recipient characteristics cannot account for the different spending responses.

The substantial deterioration in macroeconomic conditions after households received their 2008 rebates may have made them less apt to spend the additional income from lower withholding in 2009 than from the rebates in 2008, as they may have been more inclined to use additional disposable income to build up their assets or reduce their debt. To address this possibility, our survey also asks about the stimulus payments of \$250 sent to retirees in the spring of 2009. The timing of the retiree payments is similar to the timing of the change in withholding, but the delivery of this additional income is similar to the tax rebates. The first column of table 7 provides the responses from all households who received the one-time retiree payments in 2009. About 30 percent of these older households planned to mostly increase their spending in response to the retiree payment. These spend rates are well above the overall spend rates for the tax rebates or the change in withholding. The next two columns of table 7 are restricted to individuals who received both a retiree payment in 2009 and a tax rebate in 2008. For those who got both, the spend rates for the retiree payment and rebate are nearly identical. Hence, it appears one cannot appeal entirely to changing aggregate conditions to explain why the spend rate from the 2009 change in withholding is lower than from the 2008 rebate.

---

<sup>14</sup> Questions about the age of the respondent and the changes in the household's finances over the past year are collected in the survey prior to our special module on stimulus programs. Other demographic characteristics, such as total household income, are collected at the end of the survey.

<sup>15</sup> Early in the overall survey, individuals are asked: "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?" The responses to this question—which is coded as "better now," "same," or "worse off"—are an input into the construction of the Index of Consumer Sentiment.

Of course, comparing the spending response in 2009 of older households who are largely not working to the spending response of all people in 2008 may not reliably indicate the effects of macroeconomic conditions on the response to stimulus payments. For this reason we also asked individuals who did not receive the retiree payment in 2009 to consider what they would do if they did receive such a one-time payment. Table 8 provides the responses for individuals who answered questions about these hypothetical payments, the change in withholding and the tax rebates. Similar to the results from the actual retiree payments, we find that among these households the spending response to the hypothetical payments is similar to the tax rebates. Because these three questions were asked in the same survey, these results suggest that the weaker spending response to the change in withholding is not simply a reflection of the changing economic conditions between stimulus programs.

These tabulations point to the importance of the income delivery for the spending response. Additional income that is distributed to households as lump-sum payments, including the 2008 rebates and the 2009 retiree payments, appears to generate higher spend rates than income that is distributed gradually via lower withholding. While this relationship holds in the summary statistics for various groups, the next section uses multivariate regressions to separate the effects of various factors on the stimulus spend rates.

### *B. Regression Analysis*

In the regression analysis, we examine the spend/save responses to three different recent stimulus measures: the lower withholding, the tax rebates, and the retiree payments. To do so, we pool (i) the responses to the change in withholding in 2009, (ii) the prospective responses to the tax rebates in the spring of 2008, (iii) the retrospective responses to the tax rebates in the winter of 2008 and the spring of 2009, (iv) the responses to the 2009 retiree payments, and (v) the response of non-retirees to a hypothetical payment of the same amount as the 2009 retiree payment. We then estimate linear probability models pooling the various stimulus programs, actual and hypothetical. The dependent variable is set to be 100 if the stimulus program led the household to mostly spend, and zero otherwise. Thus, we combine mostly save and mostly pay off debt into a not-spend category. The explanatory variables include categorical controls for whether the extra income was delivered via lower withholding or a one-time payment, whether the survey response was prospective or retrospective, and whether the stimulus program

considered was hypothetical, as well as the amount of additional annual income that the household received from the stimulus program. In some specifications, we also include a variable about changes in the household's financial condition and a set of demographic explanatory variables (e.g., age and income).

Table 9 provides summary statistics for the observations in the sample for the regressions. The sample includes responses from over 2,500 individuals in the May and June 2008, November and December 2008, and May and July 2009 surveys. Note that some individuals provided responses regarding more than one of the three stimulus programs: the 2008 rebate, the 2009 tax credit, and the 2009 retiree payment. In this section, multiple responses for one individual are treated as separate observations, and the standard errors in the regressions are corrected for the clustering arising from doing so. In the next subsection, we examine within-person variation in the responses.

Because the 2009 surveys did not ask households directly about the dollar amount they had received or expected to receive from these three stimulus measures, in order to study the effect of the size of the stimulus we used algorithms based on the program rules and household total income and demographics to impute the dollar value of each program for each household.<sup>16</sup> In the case of the 2008 tax rebates, we can compare our imputed values to the self-reported values in the 2008 surveys. The average imputed amount of the tax rebates is 5 percent more than the amounts reported by the households, and the correlation between the imputed and self-reported amount is 0.67.<sup>17</sup> We do not expect this imputation to be perfect because the survey

---

<sup>16</sup> The 2009 tax credit equals 6.2 percent of earned income with a maximum credit of \$400 for singles and \$800 for married couples. The credit is phased out at a rate of 2 percent of income for singles with income above \$75,000 and married couples with income above \$150,000. To impute the value of the credit, we use total 2008 household income and marital status as reported on the survey. This will be quite accurate for capturing the phase-out of the credit because the phase-out is based on total household income, not earned income. For those who refused to report income (either a level or bracketed amount), we assigned values of \$400 for singles and \$800 for married couples.

The 2008 tax rebate went to all tax filers with more than \$3000 in qualifying income (Social Security benefits, veterans' benefits, and Railroad Retirement benefits plus earned income). (Those with qualifying income who ordinarily would not have to file [mainly low-income Social Security recipients] had to file a 2007 return to get the rebate.) The rebate was \$600 per adult taxpayer (\$300 for those who did not have a tax liability but received the rebate owing to having qualifying income) plus \$300 per dependent child under the age of 18. The imputation for the 2008 tax rebate assumes that singles under age 65 receive \$600 plus \$300 for each child under age 18, and that married couples receive \$1200 plus the same child benefit. The 2008 tax rebate is phased out at a rate of 5 percent of income for singles with income above \$75,000 and married couples with income above \$150,000. For both the actual and hypothetical retiree payment in 2009, we assume that households received \$250.

<sup>17</sup> According to our imputation, about 4 percent of the 2008 rebate recipients and 8.5 percent of the recipients of the 2009 Making Work Pay tax credit should *not* have received the stimulus payment or reduction in withholding, respectively. Although this could reflect errors in our imputation procedure, it is worth noting that these individuals

only includes total household income, so we cannot exactly determine the level of eligibility for the stimulus measures. Similarly, we cannot impute the retiree payments precisely because we do not know how many Social Security beneficiaries a household contains and the payments were sent to each beneficiary separately.

Another potential source of variation in how individuals perceived one-time payments is that some received them via paper check and others via electronic funds transfer. Our prior analysis of the 2008 tax rebates found no significant difference of the spend rates associated with this delivery mechanism (see table 8 in Sahm et al. 2010).<sup>18</sup> Consequently, in our surveys in 2009 we did not ask households how they received their 2008 tax rebates or their 2009 retiree payments. Because we did not ask about EFT versus paper check in the 2009 surveys, we do not include a control for the form of disbursement in the regressions.

The regression results, shown in table 10, are broadly consistent with the patterns revealed in the tabulations in the previous section. The regressions suggest that the fraction of people who report that a stimulus payment leads them to mostly spend is highest in response to a small, lump-sum payment. In the specification in the first column of table 10, which does not control for changes in macroeconomic conditions or for demographics and includes responses to all three stimulus measures, the use of lower withholding to deliver stimulus income is associated with a 10.9 percentage point reduction in the mostly-spend rates compared to a one-time payment. Thus, the use of a change in withholding for the 2009 tax credit can account for more than three-fourths of the lower mostly-spend rate of the 2009 tax credit relative to the 2008 tax rebates (as reported in table 1); this effect of the delivery mechanism is statistically significant. Of course, the 2008 rebates and the 2009 change in withholding occurred under different macroeconomic conditions, corresponded to different underlying policies, were of different size, and affected the income of households differently. The purpose of the multivariate regression analysis is to simultaneously control for these factors and then determine which factors are quantitatively most important in accounting for the lower mostly-spend rates from the 2009 tax credit relative to the 2008 tax rebate.

---

are not significantly different than the rest of the recipients in their awareness of the stimulus programs and in their propensity to spend the extra income.

<sup>18</sup> The mostly-spend rate of those who received their 2008 rebates via a paper check in the mail was 21 percent, compared to 22 percent for those who received it via electronic direct deposit; the difference between the two rates is economically and statistically indistinguishable from zero.

Before turning to the macroeconomic and demographic factors, note that, as discussed earlier, reported spending from a given stimulus appears to rise over time, as the mostly-spend rate reported twelve months after the receipt of the stimulus is almost 3 percentage points higher than the mostly-spend rate reported at the time of receipt. Moreover, there is a modest negative association between the amount of the extra income from the stimulus program and the spend rates of that stimulus. Specifically, a 1 percentage point increase in the size of the stimulus income relative to the household's income is associated with a spend rate that is roughly 1 percentage point lower. Because, on average, the 2008 tax rebate is about 1.3 percentage points larger than the 2009 tax credit (see table 9), the estimated size effect, on its own, would suggest a larger spending response to the 2009 tax credit than the 2008 rebates (which is at odds with the pattern in table 1). Finally, whether households are asked about an actual or hypothetical policy appears to have little effect on the spending response.

The estimates reported in the second column of table 10 are from a specification that adds two measures of changes in household finances—whether households reported being worse off financially at the time of their interview relative to a year prior, and their expected income growth over the next year.<sup>19</sup> These variables have both time-series and cross-sectional variation. The cross-sectional variation is critical for identifying whether macroeconomic conditions affected the response to the policy. At the aggregate level, there is no identifying information to distinguish whether the differences in spending responses between 2008 and 2009 are due to variations in policy design or from changes in macroeconomic conditions.

Households who report being worse off financially are almost 7 percentage points less likely to report mostly spending the additional income from any given policy. Moreover, households interviewed in 2009 who had just received the 2009 tax credit were, on average, only ½ percentage point more likely (not shown in the tables) to report a decline in their finances than households interviewed in the spring of 2008 who had just received the 2008 tax rebate. This small aggregate change in self-reported financial conditions applied to the regression coefficient reported in table 10 implies a trivial reduction in the aggregate mostly-spend rates from the 2008 tax rebates and the 2009 tax credits. In addition, households who expect their income to decline

---

<sup>19</sup> The questions about expected income growth are asked prior to our module. The first question in this series asks: “During the next 12 months, do you expect your (family) income to be higher or lower than during the past year?” The second question asks: “By about what percent do you expect your (family) income to (increase/decrease) during the next 12 months?” See footnote 14 for details on the other measure.

over the next year are less likely to spend the additional income from stimulus programs. For example, a household that expected their income to decline by more than 10 percent over the next year has a mostly-spend rate almost 8 percentage points lower than a household that expects their income to be unchanged. The fraction of households who expect large income declines increased from 2008 to 2009 by about 6 percentage points, but again this has a modest effect on the aggregate spend rate. Hence, though we are able to estimate a substantial effect of changing individual economic condition on spending using cross-sectional variation, there is little aggregate change in these measures of economic condition. Consequently, our estimates suggest that the switch from a one-time payment to a change in withholding was a more important factor than the worsening of economic conditions over the period for explaining the aggregate patterns in the mostly-spend rates across the two policies.

Note that the finding that spending is lower for those whose personal economic circumstances have deteriorated and whose income is expected to fall has implications for both the design of policy and for how we understand economic behavior. Under the permanent income hypothesis, a liquidity-constrained household will spend a greater fraction of an increment to cash flow than an unconstrained household provided that the constrained household has temporarily low income. Our finding that those who are currently worse off than the previous year have a lower mostly-spend rate is hard to explain with the liquidity constraints unless those households are expecting even worse economic circumstances in the future. The results for expected income growth are, however, more broadly consistent with the permanent income hypothesis. We find that expecting low income growth over the next year predicts mostly saving the stimulus payment. Hence, at least under the circumstances of 2008 and 2009, it proved difficult to jump-start the economy by providing cash to those whose economic circumstances had declined or were worsening.

The three stimulus policies that we consider were targeted at different types of households, so the specification in the third column of table 10 incorporates a number of demographic controls. Adding demographic explanatory variables to the regression modestly reduces the point estimate of the effect of the delivery mechanism, but does not change the basic patterns across the attributes of the stimulus programs and changes in economic conditions.

The demographic controls in our study are not exhaustive, so in the last two columns we use sample restrictions to further assess the robustness of our estimated effects. In the fourth

column, we use the same specification as in the third column, but we restrict the regression to observations from the 2009 tax credit and the 2009 retiree payments (actual and hypothetical). Because these policies were contemporaneous, this specification abstracts from changes in the policy and macroeconomic environment. In this specification, the coefficient estimates on “better off or worse off financially” and “expected income growth” are identified only from variation across different households in 2009, as opposed to the variation across households in 2008 and 2009. Excluding the observations on the 2008 tax rebates substantially reduces the sample and makes the estimates less precise. In terms of the point estimates, the effects of both the change in withholding and the change in economic conditions become somewhat larger in absolute value. The standard errors increase enough so that it is not possible to say with a high level of confidence that these changes do not arise due to sampling variation. In the fifth column, we instead exclude the retiree payments and focus only on the 2008 tax rebates versus the 2009 tax credits. Again, the sample restrictions reduce the precision of the estimates. With this sample, the estimated effect of the change in withholding is smaller in absolute value than in the other specifications.

In summary, the use of a change in withholding to deliver stimulus income appears to substantially reduce the spending response of households. In addition, the worsening of a household’s financial situation leads to a reduction in their propensity to mostly spend the stimulus. The positive relationship between the spending response and the time since receipt, as well as the negative relationship between the spending response and the size of the stimulus relative to household income, are more modest in magnitude and less robust across the specifications.

### *C. Qualitative Analysis of Free-Response Answers to Why Stimulus Response Changed*

An alternate approach to understand why the mostly-spend rates are lower from the change in withholding than from the rebates or the retiree payments is to simply ask households. To do so, we focus on the households who reported mostly spending the rebate or retiree payment but reported mostly saving (or paying off debt) with the lower withholding; it is this direction of change in response that dominates the aggregate results. While the sample sizes for this analysis are considerably smaller and the interpretation of individuals’ reasons for changing their

response is inevitably more subjective, these free responses largely confirm our conclusions based on the tabulations and regressions.

The free-response question was posed to two groups of individuals. As the first column of table 11 shows, 471 individuals received both a 2008 tax rebate and a 2009 tax credit in the form of lower withholding. Nearly 70 percent of these individuals report the same planned use of the additional income from both stimulus programs. It is the 14 percent who report mostly spending the 2008 rebate, but mostly saving or paying down debt in response to the 2009 lower withholding, who are most useful for understanding the lower aggregate mostly-spend rate for the change in withholding. To these individuals we asked the following question:

You said that you mostly spent last year's tax rebate and that you plan to mostly (save/pay off debt with) this year's tax credit. Why do you plan to use this year's credit differently than last year's rebate?

The distribution of responses to this question is reported in table 12, column 1.

In the July survey, we also asked a similar question to the individuals (Table 11, row 1, column 2) who said that they would mostly spend the hypothetical one-time payment, but would mostly save or pay off debt with the lower withholding. Table 12, column 2, gives the distribution of the reasons for a different use for the hypothetical payment than the lower withholding.

Table 12 summarizes the free responses of these two groups of individuals who spent the one-time payment but did not spend the lower withholding. The first column of the table refers to the 64 individuals who said they mostly spent the 2008 tax rebate but planned to mostly save or pay off debt with the 2009 tax credit (corresponding to the rounded 14 percent of respondents in the first row and first column of table 11). The most common reason (47 percent) given for this difference in behavior is a worsening of general economic or personal financial conditions. A sizeable minority (23 percent) mention the difference in how the income is delivered, for example gradual versus lump sum. Only a small fraction (3 percent) points to differences in the size of the stimulus. A non-trivial number of respondents (19 percent) simply describe some purchase in 2008 that they needed, or wanted to make that did not recur in 2009. Only 8 percent of the households could not formulate a coherent reason for why their behavior differed between the 2009 tax credit and the 2008 tax rebate.

The second column repeats the same exercise for those households who reported that they would mostly spend the hypothetical one-time payment in 2009 but would not spend the 2009 tax credit. This free-response question was only asked in the July 2009 survey, so the sample size is about half as large as in the first column. Not surprisingly, no one pointed to a change in economic or personal financial conditions to justify the difference in behavior, because the two stimulus measures are described as happening at the same time. The most common response (36 percent) is a difference in the delivery mechanism—lump sum versus a change in withholding. The free responses included comments such as it is “hard to notice” the extra money from the 2009 tax credit and that it is different having an extra \$250 in your pocket than having an extra \$20 in each paycheck, and that extra money in a paycheck goes toward paying debts rather than additional spending. Another large fraction of households (33 percent) points to the fact that the retiree payment was smaller than the tax credit and they are more inclined to spend the smaller amount. In this case, households are clearly focusing on the annual stimulus or total stimulus from the two programs, as on a monthly basis the tax credit is a smaller boost to income.

It is possible that, because the boost to paychecks from the 2009 tax credits was too small for many households to perceive (consistent with table 2), the boost to spending was too small to perceive. As in the comparisons between the 2008 tax rebate and the 2009 tax credit, a minority (12 percent) points to some particular expense for which they would use the hypothetical one-time payment. Unlike the first column, there were a number of responses (15 percent) in which households justify the different behavior as a “spend some, save some” philosophy. It is possible that this split-the-difference attitude reflects the hypothetical nature of the question, but it could also point to the fact that, even for a given household, the spending and saving heuristics are not always unambiguous. In this category are also individuals who said they would spend the retiree payment because it was unexpected or “bonus money.” As with the 2008 tax rebate sample shown in the first column of the table, only a small fraction (3 percent, that is, just one of 33 respondents) could not provide a reason for their difference in spending behavior across the two programs.

## V. Conclusion

The mostly-spend rate from the 2009 tax credit, which was delivered as a change in withholding, was less than the mostly-spend rate from the 2008 tax rebates, which was delivered as a one-time payment. This research isolates the effect of delivery mechanism by comparing the same individuals' responses to alternative policies, so it provides specific evidence on the relevance of the delivery mechanism for behavioral responses. Univariate tabulations, multivariate regressions, and analysis of free responses about the reason for a changed response for the various stimulus measures all suggest a primary role for the way in which the stimulus income is delivered to households in determining spending. Changes in economic and personal financial conditions play a secondary, but also important, role in the spending response of households to the fiscal stimulus.

As discussed in section II, the mental accounts hypothesis of Thaler suggests that a change in withholding should lead to more spending than a rebate. Under this formulation of mental accounts, a significant rebate is added to the asset account while a change in withholding is treated as an ongoing flow of income. Only a small fraction of additions to assets accounts is spent while a high fraction of ongoing flows of income is spent. Our finding does not provide support for the mental accounts hypothesis's prediction about the difference in behavior between rebates and changes in withholding.

The low propensity to consume from the 2009 change in withholding is indeed a puzzle from many perspectives. As discussed above, the Administration expected the change in withholding to be added to households' estimate of their permanent income, which would lead to the same prediction of a high spending rate as the mental accounts hypothesis. Spending from the change in withholding, however, is not a function of whether households expected the underlying tax credit to be extended.

The salience or simply the visibility of the rebate versus a change in withholding could also affect behavior. Our approach provides some evidence of the behavioral response as a function of visibility. We find that the majority of households did not notice the withholding changes associated with the 2009 Making Work Pay tax credit.<sup>20</sup> What does this inattention to

---

<sup>20</sup> The lack of awareness in our survey is also consistent with the reports from the IRS in early 2010 that a common mistake in filings for tax year 2009 was not claiming the Making Work Pay tax credit (which required filling out a new, separate form). See "Many Filers Confused by Stimulus Tax Credit" *New York Times* (April 10, 2010, page B1). The IRS, in its usual checking of filed returns, corrected this mistake for eligible households; this correction

changes in the bottom line of individuals' paychecks imply for the spending response? It is not clear what to expect a priori: will an inattentive household spend extra cash that appears in a paycheck, or allow it to accrue in a checking account? That would depend on whether the consumption "autopilot" defaults to spending or saving extra cash. The survey respondents who noticed the change in withholding were no more or less likely to spend the extra disposable income. In their study of the 2001 stimulus payment, which was delivered as a direct payment, Shapiro and Slemrod (2003a) find that whether or not a household claims to have a budget is not a significant determinant of the spending response but, conditional on having a budget, those whose budget targets spending have a somewhat higher propensity to spend relative to other budget rules.<sup>21</sup> Apparently, some households viewed the 2008 tax rebates as large enough boosts in their income to induce them to make a large purchase such as a vacation or a car repair. In contrast, households receive the 2009 tax credit as a small but repeated boost to their paychecks, so it may be less likely to trigger a large purchase; alternatively, it may be harder for people to remember and report the extra small expenses that the tax credit induced.

Our survey provides narrative evidence on why the spending response of individuals changed when faced with different mechanisms for delivering payments. In these free responses, some respondents say that the change in the withholding was too small to bother with and therefore they saved it. Note these respondents are telling us something different from the conventional wisdom that unnoticed cash gets spent. In general, near-rational, rule-of-thumb behavior can yield either spending or saving unnoticed cash depending on whether the rule of thumb targets spending or accumulation. Hence, our survey provides some direct evidence that inattention did not affect behavior in this context.

One final concern is that the survey answers used in our analysis do not provide an accurate signal of the actual spending response of households. The external validity and interpretation of such direct survey responses on the uses of stimulus income has been a long-

---

would be reflected in refund payments to the households. Interestingly this lack of awareness of the 2009 tax credit and the mistake on their tax forms may result in an unexpected boost to their net tax refunds in 2010, assuming that by ignoring the tax credit these households had calculated that they owed either too large of a tax payment or were entitled to too small of a refund. So the Making Work Pay tax credit may end up causing a more noticeable one-time payment to households. In fact, the pickup in aggregate spending from the fourth quarter of 2009 to the first quarter of 2010 may partly reflect the response to tax refunds that households primarily receive from early February through the end of April.

<sup>21</sup> As Shapiro and Slemrod (2003a) note, if taken at face value this result implies that households abandon their budget rule at the margin, that is, those who have a spending rule are more likely to mostly spend the rebate.

standing question with this research approach. On this point we note first that the research reported in this paper is primarily focused on the *difference* in the mostly-spend rates across stimulus programs, and not on the *level* of the spend rate itself. Even if levels are biased, differences (that is, between the response to direct payments versus withholding) may not be. Second, earlier work on the 2001 and 2008 tax rebates (Shapiro and Slemrod 2003b, 2009 and Sahm et al. 2010) finds that the survey responses are consistent with aggregate time-series data on spending, saving, and consumer debt. Third, support for the external validity of this approach is provided by recent work by Parker et al. (2010) using the Consumer Expenditure Survey (CEX) and by Parker and Broda (2009) using Homescan survey scanner data. Both studies include a “mostly spend/save/pay debt” survey question patterned after those developed in the line of research pursued in this paper. Households who responded that they had mostly spent the 2008 rebate had substantially higher propensities to increase spending due to the rebate as measured by their analysis of both the CEX and Homescan data, compared to households reporting that they had mostly saved or mostly paid off debt.

All in all, we estimate that the effect of these policies in stimulating spending was modest at best. Moreover, in contrast to a prominent behavioral hypothesis, the reduction in withholding led to an even lower rate of spending than did one-time payments. Just 13 percent of households said that the 2009 tax credit would lead them to mostly increase their spending—roughly half of the mostly-spend rate of 25 percent for the 2008 tax rebates. Cross-tabulations with additional survey questions, regression analysis, and qualitative analysis of the free-response questions all confirm a smaller stimulative effect from a change in withholding compared to a one-time payment. Household economic conditions and other features of the stimulus program, such as its per-household size, also play a role in the spend/save decision, and therefore in the effectiveness of the fiscal stimulus, but their effect is considerably smaller than the effect of the delivery mechanism. Therefore, the survey methods in this paper shed light both on the effectiveness of particular stimulus policies and more generally on the design of the mechanisms for delivering fiscal stimulus.

## Appendix: Survey Instrument in May 2009 and July 2009

A30. Now we would like to ask you a few questions about recent tax changes. Under this year's economic stimulus program, most workers will receive an income tax credit. The tax credit will, in most cases, be four hundred dollars to eight hundred dollars per household this year and next. The tax credit will reduce the amount of taxes withheld from paychecks. As a result, take-home pay may increase as much as sixty-seven dollars per month for married workers or forty-four dollars per month for single workers. Thinking about your (family's) financial situation this year, will this income tax credit lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

A31. Has your employer (or your spouse's employer) already reduced your tax withholding and increased your take-home pay?

*Only asked in the July 2009 survey*

A31a. Had you heard any information about this tax credit before taking part in this survey?

*Only asked in the July 2009 survey*

A31b. The current tax credit applies to this year and next year. Do you think it will be extended into future years?

A32. Under last year's economic stimulus program, many households received tax rebates that amounted to six hundred dollars for individuals and twelve hundred dollars for married couples. Those with dependent children received an additional three hundred dollars per child. The tax rebates were paid by check or direct deposit. Did you (or your family) receive a tax rebate last year?

A33. (Did/Will) last year's tax rebate lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

*If answers to A30 and A33 are not the same, go to A35, otherwise go to A36*

A35. You said that you mostly (spent/saved/paid off debt with) last year's tax rebate and that you plan to mostly (spend/save/pay off debt with) this year's tax credit. Why do you plan to use this year's credit differently than last year's rebate?

A36. Under another provision of this year's stimulus program, people who are receiving income from Social Security, Railroad Retirement, or the Veterans Administration will receive a one-time stimulus payment of two hundred fifty dollars this spring.

A36. Under another provision of this year's stimulus program, people who are receiving income from Social Security, Railroad Retirement, or the Veterans Administration will receive a one-time stimulus payment of two hundred fifty dollars this spring. Have you (or your spouse) received this one-time payment?

*Asked only in the May 2009 survey*

- A37. Do you (or your spouse) expect to receive this one-time payment?
- A38. Will this one-time payment of two hundred fifty dollars lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?
- A39. Suppose that the program rules changed and you did receive this one-time payment of two hundred fifty dollars. Would it lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

*Asked only in the July 2009 survey*

*If answers to A30 and A39 are not the same, go to A41, otherwise end section*

- A41. You said that you would mostly (spend/save/pay off debt with) this one-time payment and that you plan to mostly (spend/save/pay off debt with) this year's tax credit. Why would you use this one-time payment differently than this year's credit?

#### Questions about Personal Finances and Income Expectations

- A2. We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?
- A15. During the next 12 months, do you expect your (family) income to be higher or lower than during the past year?
- A15a. By about what percent do you expect your (family) income to (increase/decrease) during the next 12 months?

## References

- Broda, Christian and Jonathan A. Parker. (2008). "Preliminary Estimates of the Impact of the 2008 Economic Stimulus Payments on Household Spending."  
(<http://www.kellogg.northwestern.edu/faculty/parker/htm/slides/TaxReb2008.pdf>)
- Chambers, Valrie and Marilyn K. Spencer. (2008). "Does Changing the Timing of a Yearly Individual Tax Refund Change the Amount Spent vs. Saved?" *Journal of Economic Psychology*. 29(6), December, pp. 856-862.
- Chambers, Valrie, Marilyn K. Spencer, and Joseph Mollick. (2009). "Goldilocks Rebates: Complying with Government Wishes Only When Rebate Amount is 'Just Right.'" *Proceedings of the Academy for Economics and Economic Education*, 12(2), pp. 34-39.
- Economic Report of the President. (2002). Washington, DC.: US Government Printing Office.
- Economic Report of the President. (2009). Washington, DC.: US Government Printing Office.
- Economic Report of the President. (2010). Washington, DC.: US Government Printing Office.
- Epley, Nicholas, Dennis Mak and Lorraine Chen Idson. (2006). "Bonus or Rebate? The Impact of Framing on Spending and Saving." *Journal of Behavioral Decision Making*, 19(3), pp. 213-227.
- Hsieh, Chang-Tai. (2003). "Do Consumers React to Anticipated Income Changes? Evidence from the Alaska Permanent Fund." *American Economic Review*, 93(1), March, pp. 397-405.
- Johnson, David, Jonathan A. Parker, and Nicholas S. Souleles. (2006). "Household Expenditure and the Income Tax Rebates of 2001." *American Economic Review*, 95(5), pp. 1589-1610.
- Kocieniewski, David. "Many Filers Confused by Stimulus Tax Credit" *New York Times* (April 10, 2010).
- Parker, Jonathan A. (1999). "The Reaction of Household Consumption to Predictable Changes in Social Security Taxes." *American Economic Review*, 89(4), pp. 959-73.
- Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland. (2010). "Consumer Spending and the Economic Stimulus Payments of 2008."  
(<http://www.kellogg.northwestern.edu/faculty/parker/htm/research/PSJM2010.pdf>)
- Romer, Christina D. "The Case for Fiscal Stimulus: The Likely Effects of the American Recovery and Reinvestment Act." Speech delivered to the U.S. Monetary Policy Forum, New York, NY. February 27, 2009.  
<http://www.whitehouse.gov/administration/eop/cea/speeches-testimony/02272009/>

- Sahm, Claudia R., Matthew D. Shapiro and Joel Slemrod. (2010). "Household Response to the 2008 Tax Rebates: Survey Evidence and Aggregate Implications." *Tax Policy and the Economy*, Editor Jeffrey R. Brown. Cambridge: MIT Press, in press.
- Schwartz, Barry . "On the Economic Stimulus Package: The 'Packaging' Counts" (February 1, 2009) <http://www.psychologytoday.com/blog/the-choices-worth-having/200902/the-economic-stimulus-package-the-packaging-counts>.
- Shapiro, Matthew D. and Joel Slemrod. (1995). "Consumer Response to the Timing of Income: Evidence from a Change in Tax Withholding." *American Economic Review*, 85(1), pp. 274-283.
- Shapiro, Matthew D. and Joel Slemrod (2003a). "Consumer Response to Tax Rebates." *American Economic Review*, 93(1), pp. 381-396.
- Shapiro, Matthew D. and Joel Slemrod (2003b). "Did the 2001 Tax Rebate Stimulate Spending? Evidence from Taxpayer Surveys." *Tax Policy and the Economy*, Editor James Poterba. Cambridge: MIT Press, 2003.
- Shapiro, Matthew D. and Joel Slemrod (2009). "Did the 2008 Tax Rebates Stimulate Spending?" *American Economic Review Papers and Proceedings*, 99, pp. 374-379.
- Souleles, Nicholas A. (2000). "College Tuition and Household Savings and Consumption." *Journal of Public Economics*, 77, pp. 185-207.
- Sunstein, Cass and Richard Thaler. "How Behavioral Economics Could Show Up in the New Stimulus Package" (January 20, 2009) <http://nudges.org/2009/01/20/how-behavioral-economics-could-show-up-in-the-new-stimulus-package/>.
- Surowiecki, James. "A Smarter Stimulus" *New Yorker* (January 26, 2009).
- Thaler, Richard H. (1992). *The Winner's Curse: Paradoxes and Anomalies of Economic Life*. Princeton: Princeton University Press.

**Table 1: Distribution of Responses in the 2009 Surveys**

	2009 Tax Credit: Lower Withholding	2008 Tax Rebate
Percent of stimulus recipients:		
Mostly spend	13	25
Mostly save	33	25
Mostly pay debt	54	50
Percent of all respondents:		
Did not receive	34	21
Did not know use	3	1

Note: Authors' weighted tabulations of the May and July 2009 Thomson Reuters/University of Michigan Surveys of Consumers. There were 982 adult-household heads or spouses who participated in the surveys. Tabulations of stimulus recipients in the top panel exclude individuals who did not report a planned use for the stimulus payment.

**Table 2: Already Lower Withholding?**

	Survey Month in 2009		
	May/July	May	July
Percent of stimulus recipients:			
Employer already changed	38	40	35
Employer did not change	45	42	48
Don't know if changed	12	12	11
Self-employed (volunteered)	6	6	6

Note: Authors' weighted tabulations of 590 individuals in the May and July 2009 Surveys of Consumers who reported a use for the lower withholding.

**Table 3: Mostly-Spend Rates by Awareness of 2009 Withholding Change**

	Percent of Respondents	Percent w/ Lower Withholding	Percent Spend	p-value for Spend Rate
Withholding is now lower?				
Yes	40	100	10	0.14
No / Don't know	60	0	15	
Heard about credit previously?				
Yes	61	48	15	0.14
No / Don't know	39	19	9	
Expect credit to be extended?				
Yes	47	43	12	0.89
No / Don't know	53	35	11	

Note: Authors' weighted tabulations. The first question was asked in May and July to 592 individuals, and the second and third question was only asked in July to 267 individuals.

**Table 4: Distribution of Responses to the 2008 Tax Rebates**

	May/June 2008	Nov/Dec 2008	May/July 2009
Percent of stimulus recipients:			
Mostly spend	19	22	25
Mostly save	27	23	25
Mostly pay debt	53	55	50

Note: Authors' weighted tabulations. There are 848 respondents in May and June 2008, 760 in Nov. and Dec. 2009 and 745 in May and July 2009.

**Table 5: Characteristics of Stimulus Recipients in 2009 Surveys**

Percent of Stimulus Recipients	2009 Tax Credit: Lower Withholding	2008 Tax Rebate
Age		
Under 40	31	24
40 - 64	62	50
65 and over	8	26
Income		
Under \$35,000	21	32
\$35,001 to \$75,000	35	35
More than \$75,000	44	33
Personal finances compared to a year ago		
Better	24	20
Same	21	25
Worse	55	54

Note: Authors' weighted tabulations of the May and July 2009 Surveys of Consumers.

**Table 6: Distribution of Responses for Recipients of Both Policies**

	2009 Tax Credit: Lower Withholding	2008 Tax Rebate
Percent of stimulus recipients:		
Mostly spend	12	23
Mostly save	31	24
Mostly pay debt	56	53

Note: Authors' weighted tabulations of the May and July 2009 Surveys of Consumers. There were 471 adult-household heads or spouses who reported a use for both forms of stimulus.

**Table 7: Distribution of Responses to 2009 Retiree Payment**

		Recipients of Both	
	2009 Retiree Payment	2009 Retiree Payment	2008 Tax Rebate
Percent of stimulus recipients:			
Mostly spend	30	32	31
Mostly save	29	26	24
Mostly pay debt	41	41	46

Note: Authors' weighted tabulations of the May and July 2009 Surveys of Consumers. There were 356 adult-household heads or spouses who reported a use for the retiree payment and 282 households with both the retiree payment and the tax rebate.

**Table 8: Distribution of Responses for Recipients of All Three Policies**

	2009 Tax Credit: Lower Withholding	2009 Hypothetical One-Time Payment	2008 Tax Rebate
Percent of stimulus recipients:			
Mostly spend	12	24	23
Mostly save	32	30	25
Mostly pay debt	56	46	52

Note: Authors' weighted tabulations of the May and July 2009 Surveys of Consumers. There were 384 adult-household heads or spouses who reported a use for three forms of stimulus.

**Table 9: Characteristics in the Regression Sample**

	2009 Tax Credit: Lower Withholding	2008 Tax Rebate	2009 Retiree Payment	2009 Hypothetical Payment
Percent mostly spend	13	22	30	23
Percent by form of delivery				
Lower withholding	100	0	0	0
One-time payment	0	100	100	100
Percent by timing of survey response				
Contemporaneous	100	36	100	100
Six months after receipt	0	32	0	0
Twelve months after receipt	0	32	0	0
Percent hypothetical payment	0	0	0	100
Dollar value of stimulus (imputed annual)				
Mean	602	1019	250	250
Standard deviation	271	605	0	0
Mean percent of annual income	1.2	2.4	1.0	0.5
Current finances compared to a year ago				
Better off	24	23	15	23
Same	21	22	33	21
Worse off	55	55	52	56
Expected income growth $g$				
$g \geq 4\%$	24	24	14	23
$4\% > g > 0\%$	24	28	22	23
$g = 0\%$	23	25	33	24
$0\% > g > -10\%$	18	16	24	18
$g \leq -10\%$	12	8	7	13
	Table continued			
Number of observations	590	2,358	356	609

**Table 9: Characteristics in the Regression Sample - Continued**

	2009 Tax Credit: Lower Withholding	2008 Tax Rebate	2009 Retiree Payment	2009 Hypothetical Payment
Married	68	62	51	64
Have children in household	42	36	7	43
Age of respondent (head or spouse)				
Under age 30	7	8	2	6
Age 30 to 39	24	19	2	25
Age 40 to 49	28	21	7	28
Age 50 to 64	34	28	23	35
Age 65 and over	8	24	65	5
Did not report age	0	0	1	0
Household income				
Less than \$20,000	8	14	31	9
\$20,001 to \$35,000	12	17	21	11
\$35,001 to \$50,000	14	15	14	13
\$50,001 to \$75,000	21	19	11	19
More than \$75,000	43	29	14	44
Did not report income	3	5	10	4
Household stock wealth				
None	25	34	53	27
\$1 to \$15,000	17	14	9	15
\$15,001 to \$50,000	16	13	5	16
\$50,001 to \$100,000	12	10	8	10
\$100,001 to \$250,000	12	10	7	12
More than \$250,000	8	7	8	10
Did not report stock value	9	10	9	10
Did not report if stockowner	1	2	2	1
Percent with survey response in 2009	100	32	100	100
Number of observations	590	2,358	356	609

Note: Authors' weighted tabulations of the May and June 2008, Nov. and Dec. 2008, and May and July 2009 surveys.

**Table 10: Regression of Stimulus Spend Rates**

	Mostly Spend Stimulus, Pooled				
	(1)	(2)	(3)	(4)	(5)
Constant	<b>23.5</b>	<b>29.2</b>	<b>19.4</b>	<b>24.2</b>	<b>14.3</b>
	(1.3)	(2.4)	(5.3)	(8.0)	(5.7)
Lower withholding	<b>-10.9</b>	<b>-10.2</b>	<b>-7.7</b>	<b>-15.2</b>	<b>-5.0</b>
	(1.9)	(1.9)	(1.9)	(3.9)	(2.1)
Contemporaneous (omitted)					
Six months after receipt	-0.6	-0.4	0.2		2.2
	(2.0)	(2.0)	(2.0)		(2.1)
Twelve months after receipt	2.7	2.8	3.7		<b>5.9</b>
	(1.9)	(1.9)	(1.9)		(2.2)
Stimulus as percent of annual income	<b>-1.1</b>	<b>-1.0</b>	-0.3	0.7	0.4
	(0.3)	(0.4)	(0.5)	(2.0)	(0.5)
Hypothetical payment	-1.2	-0.4	2.8	-3.9	
	(2.3)	(2.3)	(2.3)	(3.8)	
Better off financially than last year		-3.8	-1.9	-3.5	-0.04
		(2.6)	(2.6)	(3.9)	(2.7)
Same financially as last year (omitted)					
Worse off financially than last year		<b>-6.7</b>	<b>-5.8</b>	<b>-6.8</b>	<b>-4.7</b>
		(2.2)	(2.2)	(3.3)	(2.2)
Expected income growth					
$g \geq 4\%$		-2.5	-0.5	0.1	-1.0
		(2.4)	(2.5)	(3.7)	(2.5)
$4\% > g > 0\%$		-0.1	1.1	1.9	1.3
		(2.4)	(2.4)	(3.8)	(2.4)
$g = 0\%$ (omitted)					
$0\% > g > -10\%$		-1.5	-1.3	0.2	-2.4
		(2.6)	(2.6)	(3.7)	(2.6)
$g \leq -10\%$		<b>-7.8</b>	<b>-6.4</b>	-6.3	-5.1
		(2.9)	(2.9)	(3.9)	(3.0)
Table continued					
Sample includes 2008 tax rebates	Yes	Yes	Yes	No	Yes
Sample includes 2009 retiree payments	Yes	Yes	Yes	Yes	No
Regression controls for demographics	No	No	Yes	Yes	Yes
Number of observations	3,913	3,913	3,913	1,555	2,948
Number of respondents	2,592	2,592	2,592	968	2,477

Note: Dependent variable equals 100 if the respondent reports mostly spending the stimulus income and zero if the respondent reports mostly saving or mostly paying off debt. Pooled linear regression have standard errors clustered on individuals. Estimates in bold are statistically different from zero at the 5% level.

**Table 10: Regression of Stimulus Spend Rates - Continued**

	Mostly Spend Stimulus, Pooled				
	(1)	(2)	(3)	(4)	(5)
Married			2.6 (1.9)	4.5 (2.7)	2.2 (1.9)
Have children in household			-0.1 (2.2)	5.1 (3.1)	-2.5 (2.3)
Under age 30 (omitted)					
Age 30 to 39			-0.4 (4.0)	0.0 (6.5)	-1.3 (4.0)
Age 40 to 49			-0.6 (3.8)	-4.6 (6.2)	-0.4 (3.9)
Age 50 to 64			2.7 (4.0)	4.2 (6.4)	0.6 (4.1)
Age 65 and over			<b>9.5</b> (4.4)	8.3 (6.9)	8.6 (4.5)
Did not report age			0.4 (14.2)	-0.2 (15.2)	-5.6 (12.7)
Household income					
\$20,000 or less (omitted)					
\$20,001 to \$35,000			2.1 (3.3)	0.9 (5.6)	5.8 (3.5)
\$35,001 to \$50,000			-1.1 (3.7)	-1.0 (6.5)	3.1 (3.9)
\$50,001 to \$75,000			-2.5 (3.8)	-5.9 (6.6)	3.7 (4.1)
More than \$75,000			1.6 (4.1)	0.3 (7.1)	6.4 (4.5)
Did not report income			0.4 (5.2)	-4.2 (8.7)	7.7 (5.7)
Household stock wealth					
No stock wealth (omitted)					
\$1 to \$15,000			-0.3 (2.7)	0.5 (4.1)	-1.2 (2.7)
\$15,001 to \$50,000			3.8 (2.9)	8.3 (4.7)	2.3 (2.9)
\$50,001 to \$100,000			2.6 (3.0)	7.2 (4.7)	-0.4 (3.1)
\$100,001 to \$250,000			1.7 (3.1)	3.1 (4.5)	0.7 (3.1)
More than \$250,000			<b>7.8</b> (4.0)	7.0 (5.6)	<b>8.6</b> (4.0)
Did not report stock value			2.9 (3.1)	2.5 (4.5)	3.1 (3.2)
Did not report if stockowner			6.3 (6.3)	23.3 (12.3)	-1.1 (6.1)
Sample includes 2008 tax rebates	Yes	Yes	Yes	No	Yes
Sample includes 2009 retiree payments	Yes	Yes	Yes	Yes	No
Regression controls for demographics	No	No	Yes	Yes	Yes

**Table 11: Comparison of Individual Responses Across Policies**

Percent of Individuals Who	2008 Tax Rebate	2009 Hypothetical Payment
Mostly spent this one-time payment, but mostly saved/paid debt with lower withholding	14	13
Mostly saved/paid debt with this one-time payment, but mostly spent lower withholding	3	4
Reported different forms of "economic" saving	15	11
Had the same response to both programs	68	72
Memo:		
Number of respondents	471	241

Note: Authors' weighted tabulations of the May and July 2009 surveys for the tax rebates and July 2009 for the hypothetical retiree payments.

**Table 12: Free-Response Reason for Different Use**

Reason Spent One-Time Payment, But 2009 Not Lower Withholding	Percent of Group	
	2008 Tax Rebate	2009 Hypothetical Payment
Economic conditions and/or personal finances worse than last year	47	0
Difference in the delivery of the extra income (gradual versus lump-sum)	23	36
Difference in the amount of the extra income	3	33
Had a particular spending need or use for one-time payment	19	12
Save some / spend some, Spend since income is unexpected	0	15
Don't know why different response	8	3
Memo:		
Number of respondents	64	33

Note: Authors' weighted tabulations of the May and July 2009 surveys.