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

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Abstract

Recent fiscal policies, including the 2008 stimulus payments and the 2009 Making Work Pay Tax Credit, aimed to increase household spending. This paper quantifies the spending response to these policies and examines differences in spending by whether the stimulus was delivered as a one-time payment or as a flow of payments from 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 in 2009 boosted spending at roughly half the rate (13 percent) as the one-time payments (25 percent) in 2008.

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, while 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 economic stimulus via higher spending per dollar than would onetime payments. 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 taxes.

In this paper, we use household survey responses to answer the question of whether the delivery mechanism of fiscal stimulus affects whether the extra income is spent or saved on receipt. The 2008 stimulus payments and the 2009 reduction in withholding were implemented under very different macroeconomic conditions. Separately identifying the effects of different delivery mechanisms from the effects of changing economic conditions presents a challenge. Our research design has multiple approaches to address this identification problem. First, our survey asks about the spending response in 2009 to the actual retiree payments as well as to hypothetical one-time payments. By simultaneously asking the same households about a series of actual and hypothetical policies, we can isolate the effect of delivery mechanism from changes in aggregate and individual economic conditions across time. Second, we analyze open-ended, free responses to provide greater

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resolution on why people respond differently depending on how an increase in disposable income is delivered. Third, we use variation in how economic conditions changed across respondents from 2008 to 2009 to control for the effect of economic conditions in explaining the response to the rebate versus the response to the change in withholding.

We find that the spending 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. Yet, the spend rates for the tax rebates in 2008 and hypothetical and actual one-time payments in 2009 were similar; this fact provides further evidence on the importance of the delivery mechanism. Tabulations of additional survey questions, regression analysis using data from 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 deterioration in household economic conditions also potentially affected the spending response to the Making Work Pay Tax Credit. We explore this hypothesis by examining how changes in financial conditions and the local unemployment rates affect the household response to the stimulus policies.

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

I. 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, it has been extended at least through 2012. The 2008 rebate was a one-time “stimulus payment.” Although 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 for two years. Although the Fiscal Year 2010 budget proposal introduced in early 2009 would have made the Making Work Pay credit permanent,[1] it did expire at the end of 2010 as provided for in the original stimulus legislation.

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 were more directly related to the 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.[2] 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 provided one-time payments to certain nonworkers, for

[1]Office of Management and Budget (2009, 17).

[2]Most taxpayers have taxable incomes that put them above the 10 percent bracket ($12,000 for couples), so the benefit of the 10 percent bracket is largely a fixed dollar amount, so the 2001 advanced payment was a lump sum. Similarly, most taxpayers have at least the amount of earnings ($12,900 for couples) for which the Making Work Pay 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 in most cases.

example, retirees receiving Social Security benefits. Hence, the stimulus packages in 2008 and 2009 provide an opportunity for comparing the effect on spending of one-time payments to the effect of 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.[3]

In 2009, 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 designed as a two-year policy that was part of a policy of extended fiscal stimulus in the face of a severe and likely protracted downturn. Because the Making Work Pay Tax Credit was integrated into the tax system, 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, 52) make explicit the aim of spreading the stimulus over several years.

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, sustained increase in take-home pay than from a large, one-time 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, 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, 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 that it generates a higher spend rate compared to a one-time check that is more likely to be put into an “asset account.” [4]

[3]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, 44) See Shapiro and Slemrod (2003b) for further discussion of the CEA analysis of the 2001 rebate.

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. [5]

James Surowiecki, writing in the *New yorker* magazine, made a similar argument, which was endorsed by Cass Sunstein and Thaler in their blog.[6]

Visibility—One reason that the delivery mechanism of a stimulus payment may matter for the induced spending response is that different mechanisms have different degrees of visibility. There are multiple dimensions to visibility. Most directly, a one-time rebate is, by definition, something unusual.[7] 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 were accompanied by 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 two letters informing them of the rebate. In contrast, the 2009 withholding change, although a significant part of the stimulus package, was one of its many components and received 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 Obama 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

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[4]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) also 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 US government or from a laboratory fund was spent more readily when it was described as *bonus* income compared to when it was described as *returned* income.

[5]Barry Schwartz, “On the Economic Stimulus Package: The ‘Packaging’ Counts,” *Psychology Today*, February 1, 2009, accessed May 30, 2012, http://www.psychologytoday.com/blog/the-choices-worth-having/200902/the-economic-stimulus-package-the-packaging-counts.

[6]James Surowiecki, “A Smarter Stimulus,” *New Yorker*, January 26, 2009. Richard H. Thaler and Cass R. Sunstein, “How Behavioral Economics Could Show Up in the New Stimulus Package,” *Nudge*, January 20, 2009, accessed May 30, 2012, http://nudges.org/2009/01/20/how-behavioral-economics-could-show-up-in-the-new-stimulus-package.

[7]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.

consistent with consumers treating it as permanent.[8] 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 how 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.

II. 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.[9] We fielded a special module in May and July of 2009 in which we asked respondents how the 2009 policies were affecting their spending, and also how the 2008 rebates had affected their spending. We also incorporate evidence obtained from similar surveys in 2008 on the tax rebates to assess the validity of the retrospective responses. 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.[10]

In May and July of 2009 we asked households the following:

> 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?

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?*

[8] 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).

[9] The Michigan survey is a nationally representative monthly survey based on about 500 telephone interviews. Individuals are selected for the survey using random digit dial sampling and 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. The analysis in this paper primarily relies on the repeated cross section of the surveys and draws on the short panel for a few sensitivity checks.

[10] See Shapiro and Slemrod (1995, 2003a, 2003b, 2009), and Sahm, Shapiro, and Slemrod (2010).

For those households who answered 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.

III. Results

A. Tabular Results

Table 1 summarizes our main finding. The spending response to the reduced withholding in 2009 was considerably weaker than the spending response to either the tax rebates in 2008 or the one-time payments in 2009. The first row shows, for the alternate policies, the percent of recipients who reported that the extra income would mostly lead them to mostly increase spending in the next year, which we henceforth refer to as the *spend rate*. The first three columns show the survey responses to the 2008 tax rebates from three different sets of surveys. In May and June 2008, as the rebates were being received, 19 percent of households said that the tax rebates would lead them to mostly increase their spending. The spend rate rises modestly in retrospective reports. In November and December 2008, about six months after the receipt of the rebates, respondents reported a 22 percent spend rate. In May and July 2009, about a year after the receipt of the rebate, the reported spend rate rose to 25 percent of households.[11]

The spend rate from the change in withholding resulting from the 2009 tax credit is substantially lower than the spend rate from the 2008 rebate. The fourth column of Table 1 shows that just 13 percent of households said that the 2009 lower withholding would lead them to mostly increase their spending—roughly half the spend rate for the 2008 tax rebates.[12] The weaker spending response to the lower withholding could reflect a change in households' response to stimulus income, regardless of its delivery, between 2008 and 2009, as overall economic conditions deteriorated. But, as the last two columns of Table 1 show, in the same survey the hypothetical one-time payment in 2009 and the actual one-time payment to retirees in 2009 both elicited significantly higher spend rates than the reduced withholding. Of course, the summary statistics in Table 1 may also mask important and relevant differences in the demographic makeup of the recipients of the various stimulus policies.[13] In what follows, we first present tabulations of the additional survey responses and then turn to multivariate econometric analysis and interpretation of the free responses to investigate why the spend rate from the Making Work Pay Tax Credit is relatively low.

Awareness of Policy—Most respondents in May and July of 2009 were unaware that the change in their withholding had already occurred. The $44 per month change in withholding

[11]The increase in the spend rate from May/June 2008 to May/July 2009 is statistically significant at the 5 percent level. In contrast, the increase in the spend rate from May/June 2008 to November/December 2008, and the differences in the saving and debt repayment rates for the rebates across the surveys, are not statistically significant. Over a long enough time horizon, we expect that additional income will be spent, but the effectiveness of the stimulus is largely judged by the near-term effects and not the long-run response.

[12]The aggregate spend rate from the lower withholding is significantly less than each of rebate spend rates at the 5 percent level.

[13]There are minor differences in the question sequences across surveys that we think are unlikely to drive the results. These differences arose mainly because the date of the survey affected the most natural way to ask the questions about the policies. For example, respondents in the 2009 surveys are not asked whether they expect to receive the 2009 tax credit, but they are asked whether they had received the 2008 tax rebate. The lead-in question about the receipt of the tax rebates was not asked in May/June 2008 survey. While a much lower fraction volunteered that they would not receive the tax rebate, the distribution of the spend/save/pay debt survey responses was quite similar to the Nov/Dec 2008 surveys when the lead-in was asked.

for single and the $67 per month 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.[14] 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:

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

While it is possible that some employers had not changed withholding, we believe that most had made the required change and that households were simply unaware of the change.

There is little direct evidence in the NIPAs 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 use independent data on withholding when it makes its monthly estimate of personal income. The daily Treasury statements provide direct, albeit noisy evidence on the actual changes in tax withholding. The Treasury data in the spring of 2009 are broadly consistent with employers adopting the new withholding tables as stipulated by the law. There is no reason to suspect that employer noncompliance was as high as the household survey responses seem to suggest.

Perhaps it is not surprising that households were unaware of the change. There was much less publicity for the 2009 change in withholding than for the 2008 stimulus payments. Moreover, there were enormous ongoing shocks to the economy and households in early 2009 that could have easily distracted attention from the change in withholding. Additionally, the 2008 stimulus payment was 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, while there was no such official notification about the 2009 lower withholding. Finally, as shown by Jones (2012), households display considerable inertia in adjusting tax prepayments in response to changes in default withholding, which is consistent with a lack of awareness of such changes. 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 between the two surveys 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 third column of 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 did not know whether their withholding had changed. (The 6 percent of respondents who volunteer that they are self-employed (see Table 1) are not included in this tabulation.) The spend rate is actually 5 percentage points *lower* for those individuals who said that employer withholding had already changed, although this

[14]Note the asymmetry between the treatment of singles and married workers. For singles, $44 per month times 9 months roughly equals the annual value of the tax credit of $400. For married workers, $67 per month times 9 months is about $600, less than the $800 value of the tax credit. Evidently, the IRS was hedging against the possibility of underwithholding 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.

difference is not statistically significantly 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.[15] 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 lack of awareness in our survey is also consistent with the reports from the IRS in early 2010 that a common mistake in filing for tax year 2009 returns was not claiming the Making Work Pay Tax Credit (which required filling out a new, separate form).[16] The IRS, in its usual checking of filed returns, corrected this mistake for eligible households; this correction 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 have resulted in an unexpected boost to net tax refunds in 2010. By ignoring the Making Work Pay Tax Credit in preparing their tax returns, 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 have led to an unexpected, one-time payment to some households in early 2010.

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 2010. 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.

Economic and Demographic Factors—Demographic and economic factors could also help explain the differences in the aggregate spend rates. Table 4 shows how some of these characteristics differ among those receiving the 2008 rebate and 2009 change in withholding. [17] A comparison of the columns of Table 4 shows that the change in withholding, which only affected workers, was targeted at younger and higher-income households relative to the tax rebate. While the households with the lower withholding were slightly more likely than recipients of the tax rebate to report being better off financially than a year ago at the time of the 2009 surveys, a comparable majority of both groups reported being worse off.[18]

Table 5 looks at the distribution of responses to the spend/save/pay debt questions by age across the various surveys. It shows that the spend rates for the tax rebate across the various surveys have generally increased with age, although this relationship is not nearly as strong in the 2009 surveys. While the spend rates for the reduced withholding episode are not

[15]The joint cross tabulations of the first two questions in Table 3 also do not reveal statistically significant differences in the spend rates.

[16]See Sandra Block, “If it feels like your tax refund's poky, you're not alone,” *USA Today*, March 16, 2010, accessed May 30, 2012, http://www.usatoday.com/money/perfi/columnist/block/2010-03-16-yourmoney16_ST_N.htm.

[17]To focus on differences in the targeting of the policies rather than the survey samples, this tabulation only includes respondents to the May and July 2009 surveys. In the multivariate analysis where we can control for demographics, etc., we pool this sample with the 2008 survey respondents to the rebate.

[18]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 are coded as “better now,” “same,” or “worse off”—are an input into the construction of the Index of Consumer Sentiment. The responses are relative to the date of the interview and not the date of stimulus receipt.

significantly different across the age groups, the oldest households again have the highest spending rate.[19]

Table 6 reports the distribution of spending response by household income. There are no significant differences in the spend rates across the income groups for either the tax rebates or the lower withholding. These univariate comparisons suggest that the different targeting of the stimulus policies is unlikely to explain the differences in the aggregate spend rates, although to further investigate this possibility we will include demographic controls in the multivariate regression analysis.

Targeting the Policies—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 ("received" here and in the rest of the paper reflects eligibility and thus includes people who report no change in their withholding at the time of the survey). Table 7 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 additional take-home pay from the lower withholding remains more than 10 percentage points below the fraction that mostly spent the rebates.

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 8 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 8 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. At least for this group of people, the passage of time and changes in the macroeconomy did not affect their reported spend rates.

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 spending 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 had received such a one-time payment. Table 9 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

[19]Note that the under 30 estimates should be approached with caution because of the small number of respondents. For example, the 37 percent mostly spend rate for rebates reported in the May/July 2009 interviews has a standard error of 9 percentage points.

payments is similar to the response to 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 that occurred between the 2008 and 2009 stimulus programs.

All in all, the tabulated survey results point to the importance of the income delivery mechanism 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. The next section uses multivariate regressions to separate the effects of various factors on the stimulus spend rates.

B. Regression Analysis: Pooled Across Policies

In the regression analysis, we examine the spend/save responses to three different recent stimulus policies: the lower withholding, the tax rebates, and the retiree payments. To do so, we estimate a linear probability model that pools the responses to five different questions: (i) the responses to the change in withholding in 2009, (ii) the contemporaneous 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 in 2009 to a hypothetical payment. The dependent variable is set to be 1 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. The coefficient estimates on the covariates are multiplied by 100, so the effects are expressed as percentage points. In some specifications, we also include a variable about changes in the household's financial condition, the level of the local unemployment rate, and a set of demographic explanatory variables (e.g., age and income).

Table 10 provides summary statistics for the covariates 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 following 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. The household-level covariates are measured at the time of survey and not necessarily the time of stimulus receipt. For example, the variable of “current finances compared to a year ago,” which is a part of the core Michigan survey, asks households to assess conditions at the time of the survey interview (in our case either May/June 2008, November/December 2008, or May/July 2009) relative to a year prior to their interview. Hence, for respondents providing retrospective stimulus responses, this variable is not aligned to the stimulus receipt. We also include the state unemployment rate, measured close to the time of the receipt of the stimulus, as an additional measure of aggregate economic conditions. In contrast to the qualitative survey responses, we align this measure temporally with the stimulus.[20]

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 on the spending response we used algorithms based on the program rules and household total income and demographics to impute the dollar value of each stimulus program for each household.[21] 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.[22] We do not expect this imputation to be perfect because the survey only includes total household income, so we cannot exactly determine the level of eligibility for the stimulus measures. We impute only one payment to households who report receiving the retiree payment because the survey does not contain information on number of recipients.

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.[23] 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.

Effects of Delivery Mechanism, Timing of Survey Response, and Size of Payment—Table 11 reports estimates of the linear probability model (coefficients multiplied by 100 so their interpretation is the percentage point response of the mostly spend rate).[24] The regression results are broadly consistent with the patterns revealed in the tabulations in the previous section. The fraction of people who report that a stimulus payment leads them to mostly spend is highest in response to a small, lumpsum payment. In the specification in the first column of Table 11, which does not control for macroeconomic conditions or 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 rather than rebate for the 2009 tax credit can account for more than

[20]Richard Curtin, the Director of the Michigan survey, provided us with the telephone area code of respondents. It is difficult to align area code with county or MSA-level unemployment data, so we aggregated to the state level. Our survey does not ask households when they received their tax rebate or when employers changed their withholding, so we use a common date for each policy. The unemployment rate variable is aligned with the receipt of the stimulus—for the 2008 rebates we chose May 2008 and for the 2009 policies we chose May 2009. The results are not sensitive to small changes in the date convention, e.g., changing the date to March or April 2009 for the withholding policy. It is possible that a household moved state between the receipt of the stimulus and their interview (which may be up to one year later), so there will be some errors in assigning the state-level measures. The difference between the average unemployment rate for the retiree payments and that for the change in withholding and hypothetical payments reflects the differing distribution of respondents across states, not differences in timing of the policies.

[21]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 $3,000 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 $1,200 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.

[22]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. This could reflect errors in our imputation procedure. These individuals are not significantly different, however, than the rest of the recipients in their awareness of the stimulus programs or in their propensity to spend the extra income.

[23]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. See Sahm, Shapiro, and Slemrod (2010), Table 8. Parker et al. (2011 also find no evidence of differences in spending responses to the 2008 tax rebates across households who received direct deposit versus paper checks.

[24]A probit analysis yields very similar estimates.

three-fourths of the lower mostly-spend rate of the 2009 tax credit relative to the 2008 tax rebates reported in Table 1. This effect of the delivery mechanism is highly 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 in different proportions. 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. The regressions reported in Table 11 include various combinations of the covariates summarized in Table 10 to account for these factors.

Table 11, column 2 includes controls for timing of receipt of the 2008 rebate, for stimulus as a fraction of income, and for whether the stimulus payment is hypothetical. The point estimate of the reporting the spending rate 12 months after the receipt of the rebate is 2.7 percent (not statistically significant) in contrast to the 6 percentage point unconditional effect reported in Table 1.

Column 1 also shows a 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 annual 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, as a percent of annual income, than the 2009 tax credit (see Table 10), 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 reported spending response.[25] This finding suggests that the survey response to hypothetical rebates is not systematically different from that of actual rebates, so that we can use the hypothetical rebates as a contemporaneous control for spending behavior from changes in withholding.

Effect of Macroeconomic Conditions—Column 2 of Table 11 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—and labor market conditions at the time of the stimulus receipt. 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. There is no identifying information at the aggregate level 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. Households interviewed in 2009 as they were receiving the 2009 tax credit were, however, only ½ percentage point more likely to report a decline in their finances than households interviewed in the spring of 2008 as they were receiving the 2008 tax rebate.[26] Hence, this

[25]In a 2002 survey, Shapiro and Slemrod (2003b) found a lower spend rate from a hypothetical one-time payment of $1,000 than the actual 2001 tax rebates (of either $300 or $600). This difference could reflect the hypothetical nature of the former payment, the relative size of the payments, or the fact that the hypothetical payment was temporary and the rebates were part of a permanent change in taxes.

small aggregate change in self-reported financial conditions applied to the regression coefficient reported in Table 11 implies a trivial reduction in the aggregate mostly-spend rates from the 2008 tax rebates and the 2009 tax credits.

Households who expect their income to decline 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 stimulus recipients who expect large income declines increased from 2008 to 2009 by about 4½ percentage points, so the expected income growth measure shows more substantial adverse changes than the "worse off financially measure." Nonetheless, the 4½ percentage point increase in those reporting at least a 10 percent decline in income still has only a modest effect on the aggregate spend rate (-7.8×0.045 moves the average predicted spend rate by less than ½ percentage point). Hence, although we are able to estimate a substantial effect of changing individual economic condition on spending using cross-sectional variation in households' self-reported conditions, there is relatively little implied effect on the aggregate spend rate from the change in these measures of economic conditions.

As an additional control for macroeconomic conditions, we include the state unemployment rate at the time of the initial receipt of the stimulus payment (May 2008 for 2008 rebate and May 2009 for the 2009 change in withholding and rebates). The point estimate is not statistically significant and changes sign across specifications, so the coefficient on the state unemployment rate does not provide any additional support for the finding that worse economic conditions are usually associated with lower spending from the stimulus payments. All in all, these 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 households who are currently worse off than the previous year have a lower spend rate is hard to explain with liquidity constraints, unless those households are expecting even worse economic circumstances in the future. Indeed, our findings run against the conventional wisdom that households in worse economic conditions are more likely to spend a stimulus payment.

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, because households did not expect the negative shocks to their personal finances to quickly reverse.

Effects of household Demographics and Targeting of the Stimulus Policies— The three stimulus policies that we consider targeted at different types of households, so

[26]Over this period there was a larger decline in the percent of these households reporting an improvement in their finances over the past year, from 27 percent in the spring of 2008 to 24 percent in the spring of 2009.

column 3 of Table 11 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 coefficients of the demographic controls in the multivariate analysis support the findings in the univariate tabulations. Older households are more likely to spend the stimulus payments. There is little relation between income and wealth and spending, except that the highest-wealth households (measured by wealth held in stock) are more likely to spend the payments.

The demographic controls in our study are not exhaustive, so we restrict the estimates to the variation within the policies to the extent possible. In column 4, we use the same column 3, but we use only the observations from the 2009 tax credit and the 2009 retiree payments (actual and hypothetical). Because these policies were contemporaneous, this specification abstracts from aggregate changes in the policy and macroeconomic environment. The coefficient estimates on better off or worse off financially, expected income growth, and state unemployment are identified only from variation across different households. 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 delivery mechanism and the change in economic conditions become somewhat larger in absolute value. The effect of the form of payment remains large and statistically significant.

In column 5, we instead exclude the retiree payments (actual and hypothetical) 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 negative effect delivering the stimulus via the change in withholding is noticeably smaller in absolute value than in the other specifications. It is not statistically significantly different from either zero, or the 9 to 12 percentage point effects found in columns 1, 2, and 3.

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.

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) the additional income from lower withholding; this direction of change in response 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 12 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. The 14 percent who report mostly spending the 2008 rebate, but mostly saving or paying down debt in response to the 2009 lower withholding, 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 the first column of Table 13. The first column of Table 13 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 12). The most common reason (47 percent) given for this difference in behavior is a worsening of general economic or personal financial conditions. A sizable 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 nontrivial 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. Although these free responses suggest a more prominent role for the changing economic conditions than the pooled regressions do, the delivery mechanism is an important factor in the weaker spending response.

The second column of Table 13 reports result from households who reported that they would mostly spend the hypothetical retiree 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 mostly spend the smaller amount; this is consistent with the tabulated results. 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 and therefore mention in response to this survey question. 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 retiree payment. Unlike in the first column, there were a substantial 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.

IV. Relationship with Other Research

Of course, research estimating the spending response to tax cuts has a long history, and the survey methodology described heretofore is just one of many research designs. Some earlier

studies used a similar survey-based methodology to estimate the spending response to policy initiatives designed to stimulate the economy. Shapiro and Slemrod (2003a, b) examined the 2001 stimulus program that sent out rebate checks of $300 or $600 to most households, and found that 22 percent responded that the receipt of the payments would lead them to mostly spend more, in spite of the fact that these payments were part of a 10-year tax cut where the cut was generally higher in later years. Wealth holding was a strong cross-sectional predictor of the spending propensity but, contrary to received wisdom at the time, low income was not.

Coronado, Lupton, and Sheiner (2005) used a similar survey methodology, analyzing questions added to the August, September, and October 2003 Survey of Consumers regarding the behavioral response to the Jobs and Growth Relief Reconciliation Act (JGTRRA), enacted in 2003. JGTRRA had two tax cut components relevant to this paper's interest, one delivered via a one-time payment and the other via reduced employer withholding, making it a natural place to evaluate the relative effectiveness of these alternative distribution mechanisms. First, it reduced most marginal tax rates above 15 percent by 2 percentage points, and reduced the top marginal tax rate by 3.6 percentage points; these rate cuts were implemented by changes in employer withholding that began on July 1, 2003. Second, it increased the child tax credit from $600 per child to $1,000 per child for 2003 and 2004. The 2003 portion of the increase ($400) per child was sent as an “advance rebate check” to those who had claimed child tax credits on their 2002 tax returns. They found that, overall, 24.0 percent of those who reported receiving the child tax credit rebate said they mostly spent it, a slightly higher spend rate than the 20.7 percent saying that they mostly spent the increase in take-home pay resulting from the reduction in employer withholding. Among the 306 households that reported receiving both a child credit rebate and reduced withholding, the mostly spend percentages were much closer: 21.4 percent for the child credit rebate and 20.6 percent for the reduced withholding tax.

Three recent studies have used the Consumer Expenditure Survey (CES) conducted by the Bureau of Labor Statistics to examine the spending response to tax rebates. Johnson, Parker, and Souleles (2006) measure the change in expenditure caused by the receipt of the 2001 rebate using a special module of questions in 2001 that asked households whether they received any rebate checks, how many rebate checks they received, and the amount of each check received. Their research design exploits the random timing of rebate payments over a 10-week period as well as the cross-sectional variation in the rebates.

They find that total expenditures, including durable expenditures such as auto and truck purchases, did not respond to the timing of the payment to a statistically significant extent. When, however, expenditures are restricted to exclude durable purchases, they do find a significant effect.[27] Their results suggest that, during the three-month period in which the rebate was received, expenditures on nondurable goods, broadly defined, increased by 37 percent of the rebate check amount. For the second and third three-month periods after the receipt of the check, the point estimate of the spending responses is positive, but in neither case is the estimate significantly different from zero. All in all, the response of nondurable (but not total) expenditures in the first quarter after the receipt of the checks is broadly consistent with what the survey responses suggest—an MPC of about one-third.[28] What differs is the suggestion that a consumption response persisted into the second, and even third, quarter after the receipt of the checks. The point estimates of the cumulative effect therefore suggest a much larger total, but not immediate, response, but the precision of the

[27]Johnson, Parker, and Souleles (2006, footnote 27) “found no significant evidence of response in durables such as automobiles or large household equipment like furniture and televisions, which again might reflect the relatively small size of the average refund per household and the greater volatility of expenditure on such durables.”

estimates that linger after the first quarter is not very high. The point estimates of the impact effects are quite close to those found in our research.

Johnson, Parker, and Souleles (2009) find a somewhat more modest spending response to the child tax credits in 2003 than to the tax rebates in 2001. They estimate that about one quarter of the child tax credit was spent on nondurables in the three-month period of receipt. The spending effect in the second three months is smaller and imprecisely measured. As in 2001, there is no evidence of spending response for durables. In 2003, the variation in the timing of receipt is too limited to provide identification for this one-time payment and the comparison to non-recipient households may be complicated by the reduction in withholding that occurred at the same time.

Parker et al. (2011), henceforth PSJM, use a similar module of questions appended to the CES to address the spending response to the 2008 economic stimulus payments. PSJM find that nondurable expenditure rose between 12 and 30 percent of the payment in the first three months after receipt of the payment, smaller than the point estimates of Johnson, Parker, and Souleles (2006) but within the range of confidence. In striking contrast to Johnson, Parker, and Souleles (2006), though, PSJM find that the rebates caused a significant increase in spending on durable goods—in particular, on vehicles—of nearly 40 percent of the rebate payment, bringing the induced total expenditure to between 50 and 90 percent of the payments. Table 14 shows that the estimated fraction of the rebates spent on new motor vehicles in PSJM would imply that the rebates generated about one-third of the aggregate outlays on motor vehicles in the second and third quarters of 2008, which seems surprisingly high particularly given that there were no dramatic shifts in motor vehicle outlays around the rebate period.[29] It does, though, raise an interesting point that an individual's MPC out of stimulus could be well above one. We assume individual MPCs at or below one when we translate mostly-spend rates to a MPC.[30]

As in our earlier research, PSJM find no significant difference in the spending response depending on the method of disbursement—mailed checks versus electronic funds transfer—holding constant demographic differences between those who choose a given disbursement method.

The outlier among the studies that use this pair of methodologies is the Shapiro and Slemrod (1995) survey-based analysis of the 1992 change in withholding designed to stimulate a weak economy. This policy is different from the other post-2000 tax cuts implemented via changes in employer withholding because it was explicitly not a tax cut at all, but rather a reduction in withholding remittances that would be exactly (other than interest) offset by either a reduced refund or an increased balance due come tax filing time in the spring of

[28]Translating the percentage of people responding that they would “mostly spend” additional disposable income into an aggregate MPC requires making assumptions about the range and distribution of individual MPCs that correspond to each possible survey answer, and then aggregating them. Shapiro and Slemrod (2003b) develop one such set of assumptions, based on a bound between zero and one for individual MPCs, that maps a 22 percent “mostly spend” rate into an aggregate MPC of about 33 percent. Coronado et al. (2005) develop another procedure for making this mapping. Note, though, that both methods presume that the individual MPCs lie between zero and one.

[29]The estimated effect of stimulus payments on new vehicle purchases, although statistically significantly different from zero at the 10 percent level, has a sizable standard error. The 90 percent confidence interval for this nominal share (using only the standard error on the PSJM point estimate) ranges from near 0 to almost two-thirds.

[30]In correspondence about Table 14, Jonathan Parker added two further caveats: First, the estimates on the individual components of spending, including new vehicles, are noisier than the estimates from broader aggregates. While the implied spending on new vehicles might be implausibly high, for other expenditure components it might seem surprisingly weak. Nonetheless, PSJM highlight the importance of vehicle spending for the overall stimulus response. Second, one should be cautious in drawing too many inferences from this type of counterfactual exercise. In the absence of the rebates, outlays on motor vehicles might have fallen more sharply during the middle of 2008. Such a sharp drop in sales might have induced automakers and dealers to reduce prices and thereby boost demand.

1993. Economic theory suggests that this kind of policy would have the least impact on spending, as it does not require a far-sighted Ricardian to see that after-tax income has not been increased at all. But a special module of questions in the April, 1992 Survey of Consumers revealed that 43 percent said they would mostly spend the reduction in withholding, a substantially higher fraction than offered this response in 2001, 2003, 2008, or 2009. It is true that the question wording differed from that used in the later surveys,[31] but there is no obvious reason why the different wording would substantially increase the frequency of "mostly spend" or "spend most of it" responses. Hence, it appears that the behavioral response to the 1992 change in withholding was, for some reason, qualitatively different from the response to the subsequent policy changes discussed here.

Because the CES added a Shapiro-Slemrod (2003a, 2009) style question to the 2008 module, it can corroborate the information content of the Survey of Consumers answers. PSJM conclude that, compared to those who say they will mostly save the lump-sum payment; those who say they will "mostly spend" spent 35 cents more per dollar on non-durables, and 75 cents more overall. Thus, the CES-based studies corroborate that survey responses are strongly associated with actual incremental spending as they measure it, but differ on the level of induced spending across all consumers' self-classifications.

However, on the focus of this paper—the effect of alternative delivery mechanisms on the propensity to spend—there is less of a consensus. No recent study, until the present one, has found that the delivery mechanism has a significant effect on the propensity to spend. Coronado et al. conclude that the spending out of a change in withholding was essentially the same as the response to a lump-sum payment. In contrast, Souleles (2002) finds high spend rates (up to 90 percent) from reductions in withholding due to the Reagan tax cuts in the 1980s; however, behavioral responses may have changed since then and many of the results are estimated with little precision. PSJM and also Sahm, Shapiro, Slemrod (2009) find no difference in the spending response of a lump-sum payment delivered by check versus electronic funds transfer. In contrast to earlier results, in this paper we find that reductions in withholding induce *less* spending than a lump-sum payment. To date, no study has found real-world evidence consistent with some behavioral theories that reductions in withholding induce *more* spending than alternative delivery mechanisms. This result may be biased if the two delivery mechanisms not only differentially affect spending propensities, but also differentially affect the ability of survey respondents to accurately gauge how the payment in fact affected their behavior relative to the counterfactual of no payment. Future research might usefully address this open question.

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 attempts to isolate 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.

[31]"How do you think you will use the extra $25 per month—do you think you will spend most of it, save most of it, use most of it to repay debts, or what?"

As discussed in Section I, the mental accounts hypothesis of Thaler (1992) suggests that a change in withholding should lead to more spending than a rebate. Under this formulation of mental accounts, a sizable 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 Obama 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. What does this inattention to 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. As Shapiro and Slemrod (2003a) note, if taken at face value this result implies that households abandon their budget rule at the margin. 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 expenditures that the tax credit induced. Sahm, Shapiro, and Slemrod (2010), in their analysis of surveys in November and December 2008, provide some evidence that households do report making additional smaller expenditures in response to stimulus. Roughly half of the rebate recipients said that they spent their 2008 tax rebates on "regular" expenses, and big-ticket durables only comprised one-quarter of rebate-induced spending.

Our survey also 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-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, Shapiro, and Slemrod 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. (2011) using the Consumer Expenditure Survey (CES) and by Broda and Parker (2008) 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 CES and Homescan data, compared to households reporting that they had mostly saved or mostly paid off debt.

All in all, none of the policies implemented in 2008 and 2009 to increase disposable income was very effective on a per-dollar basis in stimulating spending in the near term. 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 magnitude relative to total household income, also play a role in the spend/save decision, and therefore in the effectiveness of the fiscal stimulus, but their effect is 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.

The macroeconomic conditions matter for explaining the spending from the stimulus income. Households who reported that their financial condition had recently deteriorated are less likely to spend the stimulus income. Also, a common explanation in the free responses for spending the 2008 stimulus payment while saving the 2009 change in withholding was worsening economic circumstances. This finding runs counter to the conventional wisdom that the MPC is higher when household economic conditions are worse. We do find that spending is higher when total household income is expected to improve. Moreover, the finding that the delivery form matters survives controlling for cross-sectional variation in macroeconomic conditions facing households. Because the 2008 rebate policy and the 2009 change in withholding were implemented in very different macroeconomic contexts, a concern is that the different spending rates across policies simply arose from difference in the conditions when they were implemented. To the extent that cross-sectional variation in macroeconomic conditions is an adequate control, we can show that this legitimate concern does not reverse the finding that the delivery mechanism of stimulus income matters.

Of course, all these considerations also apply to econometric estimates of the marginal propensity to consume based on expenditure data. A case in point of how the response to policies differs across time in expenditure data is apparent on estimates based on the CES. Johnson, Parker, and Souleles (2006) find that the response of durable consumption to the 2001 rebate was so hard to detect that they did not include results in their published paper. Parker et al. (2011) find that the response of durable consumption, especially automobiles, to the 2008 stimulus payment swamps the response of nondurable consumption. The

juxtaposition of these estimates provides a salient example of how the MPC in response to a particular policy may not be a structurally invariant parameter.

The survey approach measures the propensity to consume at a particular point in time in response to a particular policy. It is important to understand that it does not aim to estimate a structurally invariant parameter. There are good reasons why the propensity to consume might vary over time. First, stimulus policies differ over time. In some cases the payments are explicitly one-time, in other cases they relate to persistent changes in taxes. Second, stimulus policies are introduced under very different economic conditions. The fraction of consumers who are liquidity constrained or who are trying to rebuild their balance sheets may be different. Third, stimulus payments are distributed by different mechanisms that can affect how they are perceived and spent. Fourth, stimulus polices target different groups that have different propensities to consume. For example, it is likely that a higher fraction of payments going to older households will be spent.

Because the survey approach yields timely estimates of the propensity to consume stimulus income, it provides direct evidence on the effectiveness of recent policies. Moreover, the statistical analysis such as carried out in this paper can provide insight into why the effects of policies differ over time by examining how economic conditions, household demographics, and the mechanisms of delivery of the payments affect the response to the stimulus payments. This paper is part of a line of research that examines the response to policies across time using consistent survey questions. By pooling across different policies, it provides evidence about how the details of how the policies were implemented and how the macroeconomic conditions affect the response to the policies.

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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. Have you (or your spouse) received this one-time payment?

Asked only in the May 2009 survey if no to A36

A37 Do you (or your spouse) expect to receive this one-time payment?

Asked if received actual 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?

Asked if did not receive actual one-time payment

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?

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Table 1

Distribution of Responses to Stimulus

	2008 Tax rebate			2009 Policies		
				Lower withholding	Hypothetical payment	Retiree payment
Survey date	**May/June 2008**	**Nov./Dec. 2008**	**May/July 2009**	**May/July 2009**		
Percent of stimulus recipients						
Mostly spend	19	22	25	13	23	30
Mostly save	27	23	25	33	31	29
Mostly pay debt	53	55	50	54	46	41
Percent of all respondents						
Did not receive	9	19	20	34	34	66
Did not know use/receipt	2	3	3	3	1	1

Notes: Authors' weighted tabulations of the Thomson Reuters/University of Michigan Surveys of Consumers. All tabulations and regressions in the paper use the household head weight, which is nonzero for household heads or their spouses. This is the same weight used in the Index of Consumer Sentiment that is published monthly from the survey results. There were 982 adult-household heads or spouses who participated in the May/July 2009 surveys, 990 in the November/December 2008 surveys, and 980 in the May/June 2008. 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	44	43	12	0.82
No/don't know	56	32	13	

Notes: Authors' weighted tabulations of individuals who reported a use for the lower withholding. The response to the first question includes 552 (non self-employed) individuals in May and July 2009. The second and third questions were only asked in July 2009 to 289 individuals.

Table 4

Demographics of Stimulus Recipients in 2009 Surveys

	Percent of stimulus recipients	
Percent of stimulus recipients	**2009 tax credit: lower withholding**	**2008 tax rebate**
Age of respondent		
Under 40	31	24
40–64	62	50
65 and over	8	26
Household 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 5

Age and the Response to Rebates and Change in Withholding

		Frequencies					
Age of respondent	**Percent of group (A)**	**Spend (B)**	**Save (C)**	**Pay debt (D)**	**No rebate (E)**	**Percent spend (F)**	***p*-value (G)**
Rebates: Interview May/June 2008							
Under 30	8	9	14	51	3	12	
30–39	18	25	43	97	12	15	
40–49	23	29	48	110	31	16	0.002
50–64	28	44	61	128	31	19	
65 and over	23	62	70	71	16	30	
Rebates: Interview November/December 2008							
Under 30	8	6	12	35	20	11	
30–39	18	25	31	94	20	17	
40–49	21	41	31	93	40	25	0.059
50–64	29	46	47	122	66	21	
65 and over	24	49	59	80	45	26	
Rebates: interview May/July 2009							
Under 30	5	15	9	16	6	37	
30–39	17	28	38	76	22	20	
40–49	21	32	33	86	47	21	0.138
50–64	31	54	44	128	72	24	
65 and over	26	58	61	73	51	30	
Withholding: Interview May/July 2009							
Under 30	5	6	13	24	2	14	
30–39	17	20	44	83	17	14	
40–49	21	14	53	103	30	8	0.270
50–64	31	27	70	111	83	13	
65 and over	26	11	23	13	201	23	

Notes: Authors' weighted tabulations. Column A is percent of all respondents to the survey in each age group regardless of whether they receive the stimulus or not. Column F is percent of stimulus recipients who plan to mostly spend the additional income. A smaller fraction of respondents (household heads) are in the under 30 group between 2008 and 2009.

Table 6

Income and the Response to Rebates and Change in Withholding

		Frequencies					
Household income	**Percent of group (A)**	**Spend (B)**	**Save (C)**	**Pay debt (D)**	**No rebate (E)**	**Percent spend (F)**	***p*-value (G)**
Rebates: May/June 2008							
$0 to $20,000	15	18	22	90	16	14	
$20,001 to $35,000	17	37	42	78	3	23	
$35,001 to $50,000	13	23	27	73	2	18	0.462
$50,001 to $75,000	18	31	54	81	4	19	
More than $75,000	32	46	74	118	63	19	
Refused/don't know income	6	13	16	22	5	26	
Rebates: November/December 2008							
$0 to $20,000	15	20	14	67	44	20	
$20,001 to $35,000	16	29	25	78	21	22	
$35,001 to $50,000	14	21	36	65	8	17	0.208
$50,001 to $75,000	17	27	33	95	13	17	
More than $75,000	33	59	58	106	92	26	
Refused/don't know income	5	11	13	13	14	30	
Rebates: May/July 2009							
$0 to $20,000	17	25	25	60	50	22	
$20,001 to $35,000	14	31	21	68	14	26	
$35,001 to $50,000	13	23	21	67	17	21	0.775
$50,001 to $75,000	16	34	36	70	16	24	
More than $75,000	34	66	71	98	87	28	
Refused/don't know income	6	11	12	16	17	27	
Withholding: May/July 2009							
$0 to $20,000	17	6	9	36	109	12	
$20,001 to $35,000	14	10	21	44	62	13	
$35,001 to $50,000	13	12	14	58	42	14	0.728
$50,001 to $75,000	16	15	39	75	26	12	
More than $75,000	34	33	113	116	56	13	

		Frequencies					
Household income	**Percent of group (A)**	**Spend (B)**	**Save (C)**	**Pay debt (D)**	**No rebate (E)**	**Percent spend (F)**	***p*-value (G)**
Refused/don't know income	6	2	7	8	39	12	

Notes: Authors' weighted tabulations. Column A is percent of all respondents to the survey in each income group regardless of whether they receive the stimulus or not. Column F is percent of stimulus recipients who plan to mostly spend the additional income.

Table 7

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

Notes: 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 8

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

Notes: 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 who received (or expected to receive) both the retiree payment and the tax rebate.

Table 9

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

Notes: 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 each of the three forms of stimulus.

Table 10

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	1,019	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				
$g >= 4\%$	24	24	14	23
$4\% > g > 0\%$	24	28	22	23
$g = 0\%$	23	25	33	24
$0\% > g > -10\%$	18	16	24	18
$g <= -10\%$	12	8	7	13
State unemployment rate near time of receipt				
Mean (percent)	9.3	5.3	9.5	9.3
Standard deviation	1.8	1.0	1.8	1.8
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

	2009 Tax credit lower withholding	2008 Tax rebate	2009 Retiree payment	2009 Hypothetical payment
$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 interview in 2009	100	32	100	100
Observations	590	2,358	356	609

Notes: Authors' weighted tabulations of the May and June 2008, November and December 2008, and May and July 2009 surveys. Variables with comparisons over "last year" or "next year" are also measured relative to the interview month—and not necessarily the month of stimulus receipt. The state unemployment rate for the 2008 rebates is measured at May 2008 and for the 2009 policies at May 2009. The telephone area codes at the time of the interview are used to determine state of residence.

Table 11

Pooled Regression of Stimulus Spend Rates

	Mostly spend stimulus, pooled				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Regression sample					
Includes 2008 tax rebates	Yes	Yes	Yes	No	Yes
Includes 2009 change in withholding	Yes	Yes	Yes	Yes	Yes
Includes 2009 one-time payments	Yes	Yes	Yes	Yes	No
Controls for demographics	No	No	Yes	Yes	Yes
Covariates					
Constant	**23.5** (1.3)	**24.9** (3.5)	**15.9** (6.1)	**27.1** (8.2)	**13.4** (7.7)
Lower withholding	**–10.9** (1.9)	**–12.0** (2.1)	**–9.1** (2.0)	**–15.2** (3.2)	–5.6 (3.8)
Contemporaneous (omitted)					
Six months after receipt	–0.6 (2.0)	0.3 (1.8)	0.7 (1.7)		2.2 (1.8)
Twelve months after receipt	2.7 (1.9)	3.6 (2.0)	**4.3** (2.0)		**5.9** (2.1)
Stimulus as percent of annual income	**–1.1** (0.3)	**–0.9** (0.4)	–0.3 (0.5)	0.7 (1.7)	0.4 (0.6)
Hypothetical payment	–1.2 (2.3)	–2.1 (2.4)	1.4 (2.2)	–3.9 (3.1)	
Better off financially than last year		–3.7 (2.6)	–1.9 (2.7)	–3.5 (4.2)	–0.04 (2.7)
Same financially as last year (omitted)					
Worse off financially than last year		**–6.6** (2.2)	**–5.8** (2.1)	**–6.8** (2.7)	**–4.7** (2.1)
Expected income growth over next year					
g >= 4%		–2.3 (2.9)	–0.4 (3.0)	0.0 (4.0)	–0.9 (2.8)
4% > *g* > 0%		0.1 (2.8)	1.2 (2.7)	1.8 (4.0)	1.3 (2.7)
g = 0% (omitted)					
0% > *g* > –10%		–1.5 (2.3)	–1.3 (2.3)	0.2 (3.3)	–2.4 (2.3)
g <= –10%		**–7.8** (3.1)	**–6.4** (3.1)	–6.3 (4.3)	–5.1 (2.8)
State unemployment rate		0.6 (0.4)	0.5 (0.4)	–0.3 (0.5)	0.2 (0.8)
Married			2.5 (1.7)	4.5 (3.0)	2.2 (1.9)
Have children in household			–0.01 (2.2)	5.0 (2.7)	–2.5 (2.4)
Under age 30 (omitted)					
Age 30 to 39			–0.5 (3.4)	0.2 (5.8)	–1.3 (3.7)

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	Mostly spend stimulus, pooled				
	(1)	(2)	(3)	(4)	(5)
Age 40 to 49			–0.7 (4.0)	–4.5 (5.9)	–0.4 (4.4)
Age 50 to 64			2.6 (4.1)	4.3 (5.0)	0.6 (4.7)
Age 65 and over			**9.3** (4.3)	8.4 (5.4)	8.6 (5.0)
Did not report age			0.5 (14.3)	–0.3 (14.8)	–5.4 (13.2)
Household income					
$20,000 or less (omitted)					
$20,001 to $35,000			2.4 (2.9)	0.9 (6.3)	**5.8** (2.8)
$35,001 to $50,000			–0.8 (3.9)	–1.0 (6.3)	3.1 (4.3)
$50,001 to $75,000			–2.1 (3.3)	–5.8 (5.4)	3.6 (4.0)
More than $75,000			2.0 (4.1)	0.4 (5.3)	6.4 (5.1)
Did not report income			0.9 (4.5)	–4.2 (7.6)	7.7 (5.8)
Household stock wealth					
No stock wealth (omitted)					
$1 to $15,000			–0.3 (2.8)	0.6 (4.6)	–1.3 (2.6)
$15,001 to $50,000			3.8 (2.8)	**8.4** (3.8)	2.2 (2.9)
$50,001 to $100,000			2.5 (2.7)	7.3 (3.8)	–0.4 (3.2)
$100,001 to $250,000			1.8 (3.3)	3.0 (3.9)	0.8 (3.8)
More than $250,000			**7.9** (3.4)	7.0 (4.1)	**8.6** (4.0)
Did not report stock value			3.0 (3.2)	2.5 (4.8)	3.2 (3.4)
Did not report if stockowner			6.5 (5.6)	23.3 (13.0)	–1.1 (5.8)
Observations	3,913	3,913	3,913	1,555	2,948
Respondents	2,592	2,592	2,592	968	2,477

Notes: Regressions are weighted. Dependent variable equals 1 if the respondent reports mostly spending the stimulus income and zero if the respondent reports mostly saving or mostly paying off debt. All coefficients in the table are multiplied by 100, so the estimates are expressed in percentage points. Pooled linear regressions have standard errors clustered on individuals in the first specification and clustered on states in the rest of the specifications. Estimates in bold are statistically different from zero at the 5 percent level.

Table 12

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 13

Free-Response Reason for Different Use

	Percent of group	
Reason spent one-time payment, but not 2009 lower withholding	**2008 Tax rebate**	**2009 Hypothetical payment**
Change in 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.

Table 14

Estimated Impact of 2008 Stimulus Payments on New Vehicle Purchases Based on PSJM (2011) Results

	(Nominal billion dollars, annual rate)			
	Nominal expenditures by households on new vehicles, seasonally adjusted[1]	2008 stimulus payments, nominal, not seasonally adjusted[2]	Nominal stimulus-induced spending on new vehicles, seasonally adjusted[3]	Nominal share of new vehicle purchases induced by stimulus payments[4]
Month	(1)	(2)	(3)	(4)
January	218.4			
February	217.4			
March	207.8			
April	203.7	23.3	4.0	0.02
May	197.9	577.1	90.8	0.46
June	186.4	334.4	157.2	0.84
July	167.3	164.1	82.4	0.49
August	193.2	12.4	28.3	0.15
September	176.3	8.1	4.0	0.02
October	151.3	11.7	3.7	0.02
November	149.5	13.1	5.1	0.03
December	149.2	2.6	2.6	0.02
2008	184.9	95.6	31.5	0.17

[1] *Source:* BEA

[2] *Source:* Daily Treasury Statements

[3] The estimated average share of the stimulus payments spent on new vehicle purchases within three months of stimulus receipt is 0.357 (standard error 0.204) in Table 12 in PSJM. There are no spending effects in Table 12 after the first three months so, following PSJM, we assume that the contemporaneous share of 0.357 is spent evenly in the month of stimulus receipt and the subsequent month. For the seasonal adjustment of stimulus-induced spending, we use the FRB's seasonal factors for total light vehicle sales, which range in this period from 92 in September 2008 to 117 in May 2008.

[4] Ratio of column 3 to column 1. The average estimated nominal share of new vehicle purchases due to the stimulus payments is one-third in 2008:II to 2008:III. The 90 percent confidence interval for this nominal share (using only the standard error on the PSJM point estimate and not any sampling error in the data) ranges from near 0 to almost two-thirds.