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DID THE 2001 TAX REBATE STIMULATE SPENDING? EVIDENCE FROM TAXPAYER SURVEYS

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EXECUTIVE SUMMARY

Many households received rebate checks in 2001 as advanced payments of the benefit of the new 10 percent federal income tax bracket. A survey conducted at the time the rebates were mailed finds that few households said that the rebate led them mostly to increase spending. A follow-up survey in 2002 as well as a similar survey conducted after the attacks of 9/11 also indicates low spending rates. This paper investigates the robustness of these survey responses and evaluates whether such surveys are useful for policy evaluation. It also draws lessons from the surveys for macroeconomic analysis of the tax rebate.

1. INTRODUCTION

1.1 Motivation

As part of the 10-year tax cut bill passed by Congress in the spring of 2001, tax rebate checks for as much as \$600 were mailed to American

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households beginning in late July and continuing until late September. Although the tax rebate was not originally conceived as an anti-recessionary policy, by the spring of 2001, this justification was one of several offered for the tax cut and for delivering part of it in this visible form.

According to the standard Keynesian model, the tax rebate would be more effective if it generated an increase in the amount of consumption. How effective was it in meeting this goal? The Bush administration certainly claimed that it was effective in providing a substantial short-run stimulus to the economy. According to a Council of Economic Advisers white paper released in early 2002, it "provided valuable stimulus to economic activity in the short run. The quick enactment last year of the President's tax relief plan softened the recessionary headwinds in 2001 and has helped to put the economy on the road to recovery in 2002."

This paper has three objectives. First, we review survey evidence regarding how effective the tax rebate was in generating consumption and thereby potentially countering an incipient recession. We focus on the results of three consumer surveys: one conducted while the rebates were being received; one conducted for a separate group of people concerning a hypothetical, temporary rebate; and a third conducted six months later in which there is significant overlap of respondents from the first survey. Second, we address the reliability of consumer survey evidence and how it squares with other macroeconomic indicators of the effectiveness of the tax rebate. Finally, we assess how our survey evidence on the spending rate of the tax rebate bears on estimates of the short-run aggregate impact of the 2001 policy.

*1.2 The 2001 Tax Rebate*¹

Under the Economic Growth and Tax Relief Reconciliation Act of 2001, taxpayers were entitled to a rebate in tax year 2001 of up to \$300 for single individuals and up to \$600 in the case of a married couple filing a joint return. Most taxpayers received this payment in the form of a check issued by the Department of the Treasury. These checks were sent out beginning the week of July 23, 2001, and ending the week of September 24, 2001. Which week a taxpayer received the check depended on the second-to-last digit of their Social Security number.

The tax rebate that we study corresponded to a new 10 percent income tax bracket for a portion of taxable income that was previously taxed at 15 percent, effective for taxable years beginning January 1, 2001. The tax rebate scheme was designed to deliver the benefit of the new 10 percent

¹ The description of the rebate program and the first survey draws on Shapiro and Slemrod (2003).

income tax rate in a highly visible way during calendar year 2001. The 10 percent bracket applied to the first \$6,000 of taxable income for single individuals, \$10,000 of taxable income for heads of household, and \$12,000 for married couples filing joint returns. Thus, the maximum rebate for a married couple filing jointly was 5 percent of \$12,000, or \$600. The rebates for taxpayers with other marital status were calculated in the same manner.

The tax rebates were substantial, both from the point of view of an average household or in aggregate. The Treasury calculated that 92 million received a rebate check, with 72 million receiving the maximum amount for their marital status. The rebates amounted to \$38 billion, or approximately 0.4 percent of 2001 gross domestic product (GDP). Median family income in 2000 was about \$41,000, so a \$600 rebate represents about 1.5 percent of median annual income and a greater share of disposable income for a typical household. The size of the rebate was capped. Thus, the fraction of income represented by the rebate decreased as income rose once a family received the maximum rebate.

The remainder of the paper is organized as follows. Section 2 presents our survey methodology and our findings about the spending rate from the tax rebate. Section 3 discusses some of the criticisms of and potential problems with surveys. We use results from the follow-up surveys to address the validity of survey responses. Section 4 examines aggregate economic outcomes and how our survey results inform them. Section 5 offers our conclusions.

2. SURVEY EVIDENCE ON THE SPENDING RATE

This paper reports on three surveys that concern spending of the tax rebate. Our first survey was conducted in August to October 2001, which overlapped or shortly followed the mailing of the rebate. Our second survey was conducted retrospectively, in March and April of 2002. A subset of respondents responded to both surveys. The final survey—which asked about a hypothetical, temporary rebate—was conducted in mid-September to mid-October of 2001. Table 1 summarizes the surveys.

2.1 Survey Methodology

Our first survey instrument was a rider on the University of Michigan Survey Research Center's Monthly Survey, also known as the Survey of Consumers. The Monthly Survey provides a representative sample of households in the contiguous 48 U.S. states and the District of Columbia.

TABLE 1
*The Surveys**

Survey	Dates	Observations (number)	Rebate question	Spending rate (percentage)
Survey of Consumers, Wave I	August, Sep- tember, Octo- ber 2001	1,506	Actual 2001 rebate	21.8
Survey of Consumers, Wave II	March, April 2002	1,002 405 rein- terview 597 new respon- dents	Actual 2001 rebate, retro- spective	24.9
How America Responds	Mid-September to mid-October, 2001	752	Hypothetical, temporary rebate	16.6

* Number of respondents is unweighted. Spending rate is weighted fraction of respondents receiving rebate who said that they would spend it.

The survey's core content contains questions about expectations of economywide and family economic circumstances that are the basis of the University of Michigan Index of Consumer Sentiment.

The Survey of Consumers is a random digit dial survey of approximately 500 households conducted each month. It includes about 300 new respondents and 200 respondents re-interviewed from six months earlier. We use this panel structure for our re-interview survey, discussed below.² The survey was conducted from August to October 2001. The first two months of data were collected while households were in the midst of receiving rebate checks. By October, most households entitled to checks should have received them.

The tax rebate survey module begins by briefly summarizing the tax policy change and the rebate, and then addresses the household response to the rebate. Specifically, the key question was:

Earlier this year a Federal law was passed cutting income tax rates and expanding certain credits and deductions. The tax cuts will be phased in over the next ten years. This year many households will receive a tax rebate check in the mail. In most cases, the tax rebate will be \$300 for single individuals and \$600 for married couples. Thinking about your (family's) financial situation this year, will the tax

² See <http://www.sca.isr.umich.edu/> for more information about the Survey of Consumers.

rebate lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

2.2 Results: First Survey

Overall, only 21.8 percent of households reported that the tax rebate would lead them mostly to increase spending. Furthermore, there was no evidence that the spending rate was higher for low-income households, as might be expected if liquidity constraints were driving the cross-sectional variation. In Shapiro and Slemrod (2003), we discuss the survey results in more detail. In that paper, we draw three policy implications: (1) the tax rebate had a small impact on aggregate demand and therefore may not have succeeded in providing a short-run stimulus, (2) there is no evidence that a tax rebate targeted at low-income households would be more effective in stimulating aggregate demand, and (3) the spending rate may be contingent on aggregate conditions that are difficult to anticipate.

2.3 New Evidence from the 2002 Retrospective and Post-9/11 Surveys

To shed more light on these issues, we drafted two separate follow-up survey instruments. First, we designed a set of questions—including the principal question from the 2001 survey—as a module for the March and April 2002 Survey of Consumers. The total sample size was 1,002. For each month, about 40 percent had also been surveyed six months earlier, and thus had been asked the earlier set of questions in September or October of 2001. In total, 405 of the 1,002 surveyed in 2002 had also been surveyed in 2001. The principal retrospective question was:

Last year a Federal law was passed cutting income tax rates and expanding certain credits and deductions. Some tax cuts took effect last year and others will be phased in over the next nine years. Last year many households received a tax rebate check in the mail. In most cases, the tax rebate was \$300 for single individuals and \$600 for married couples. Did the tax rebate lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

The third instrument was part of an extraordinary survey effort in the fall of 2001. In response to the attacks on New York and Washington, D.C., of September 11, 2001, the University of Michigan Survey Research Center fielded a new survey called *How America Responds (HAR)*. The principal aim of this survey was to discover if there were shifts in economic, social, political, and psychological attitudes following the attack. Most important for our study, the survey included a hypothetical version

of the question about tax rebates that was included in the August through October 2001 Survey of Consumers discussed above. The hypothetical question read as follows:

This year many households have received a tax rebate check in the mail amounting to \$300 or \$600. Suppose the Federal government cut taxes an additional \$1000 per household for this year only and sent this \$1000 rebate to you (your family) in October of this year. Thinking about your (family's) financial situation this year, would the tax rebate lead you mostly to increase spending, mostly to increase saving, or mostly to pay off debt?

The last sentence of the question is almost identical to the Survey of Consumers rebate question. However, the tax rebate about which it asks is hypothetical, amounts to \$1,000 instead of \$300 or \$600, and is not part of a larger multiyear tax cut.

2.4 Spending Rates: Follow-up Surveys

2.4.1 Survey of Consumers Retrospective Survey The aggregate responses in the retrospective Survey of Consumers instrument were strikingly similar to the answers given in 2001. In the 2001 survey, the weighted responses were 21.8 percent, 32.0 percent, and 46.3 percent for mostly spend, mostly save, and mostly pay down debt, respectively. In 2002, they were 24.9 percent, 27.1 percent, and 48.0 percent for mostly spend, mostly save, and mostly pay down debt, respectively. Of those in the second wave who were also in the first wave, the weighted breakdown was 28.1 percent mostly increase spending, 25.2 percent mostly increase saving, and 46.7 percent mostly pay off debt.³ Given the tendency to report higher spending rates conditional on having received the rebate [see Shapiro and Slemrod (2003)] and that most individuals would have received the rebate by the time of the retrospective survey, the findings of the initial and retrospective survey are practically identical.

2.4.2 Post-9/11 Survey The results of the HAR survey also corroborated the basic finding of a low spending rate. Only 16.6 percent said that they would mostly spend the hypothetical \$1,000 rebate, 36.5 percent said that they would mostly increase saving, and 46.9 percent said that they would

³ This last calculation uses the weights of the second wave. Using the first-wave weights, the percentages are 28.9, 26.1, and 45.1, respectively. Recall that the second wave surveyed some people who were surveyed in either September or October 2001, but none of those surveyed in August 2001, and surveyed many people who were not part of the first wave.

mostly pay off debt. The hypothetical rebate was temporary and not accompanied by any other income tax cuts, so a lower reported spending rate in this context is consistent with economic theory. Nonetheless, the spend percentage is quite close to what we find for the actual rebate. Like our estimate for the actual tax rebate, the spending rate from the hypothetical rebate is much smaller than what was found in earlier studies.

In sum, the finding that slightly less than one-quarter of consumers would mostly spend a tax rebate is not confined to the initial survey conducted in the late summer and early fall of 2001. It has been corroborated in a retrospective survey of many of the same households that participated in the original survey, and in a separate survey that asked a similar question regarding a hypothetical second round of tax rebates.

3. VALIDATING SURVEYS

Given the important policy implications of these findings, it is worthwhile to be circumspect about the soundness of the methodology and to present evidence about the validity of the survey results. The next subsection addresses the issue of whether people mean what they say in such a survey. In subsequent subsections, we try to address this question using our follow-up surveys. We consider the ability to explain cross-sectional variation in survey responses, the consistency of individual responses across waves of the survey, and new questions on the follow-up surveys designed to probe for ambiguities in how respondents interpret our question about spending or saving the rebate.

3.1 Do People Mean What They Say?

One possible caveat is that survey answers might not reflect households' actual behavior. In support of this criticism, Souleles (2002) cites Robert Frost as follows:

*Never ask of money spent
Where the spender thinks it went
Nobody was ever meant
To remember or invent
What he did with every cent.*

Of course, the use of this quotation by Souleles is quite ironic in view of the fact that his estimate of the marginal propensity to consume (MPC) out of the Reagan tax cut is based entirely on the *Consumer Expenditure Survey* (italics added for emphasis), which asks people to remember expenditures over the previous three months on food, alcohol, utilities,

household operations, house furnishings and small appliances, rent and other durable shelter expenses, apparel and services, transportation, entertainment, personal care, reading materials, tobacco, and miscellaneous expenses. Not every cent, but close.⁴

The point is that economic analysis based on surveys is standard, indeed ubiquitous, in economics. The real methodological issue and the difference between, for example, the Consumer Expenditure Survey and the question we added to the Survey of Consumers is that we asked people about their consumption *compared to a counterfactual state of the world in which they received no rebate*. The issue is not whether the survey reflects actual behavior, but how accurately it measures actual behavior relative to a counterfactual.

Even if the survey question responses reflect systematic cognitive errors, one might learn from differences across time in the answers to similarly worded questions. For example, a similar but not identical question that we asked (Shapiro and Slemrod, 1995) about the 1992 change in the standard income tax withholding amounts revealed a 43 percent spend rate, compared to the 21.8 percent spend rate found in 2001. Souleles (2002) reports on a New York Times/CBS News poll in May 1982. The poll found that 50 percent of respondents said that they would spend the second phase of the Reagan tax cut; this response compares to his estimate of 0.6 to 0.9 for an overall MPC for nondurable goods. Katona and Mueller (1968) conducted similar surveys after the 1964 tax cut. Three months after the change in withholding, about 50 percent of respondents said that they spent the increased income on "general" or "everyday" expenses, 13 percent said that they saved it, and about one-third were unable to say what they did with it. Thus, in the recent past, about half of people surveyed indicated that they would spend a tax cut delivered in one form or another, and in 2001 only about one-quarter said the same. The conclusion that the spending rate for the 2001 tax rebates was lower than in similar past episodes is reinforced by the fact that, in a Gallup Poll released on July 24, 2001, only 17 percent of those surveyed said that they would spend the tax rebate, while 32 percent said that they would save or invest it, and 47 percent said that they would use it to pay off bills. Thus, a similar but distinct survey conducted at about the same time also indicates a very low spending rate out of the rebate.

⁴ Souleles's research uses the Consumer Expenditure Survey's quarterly retrospective survey, as does almost all similar research. Stephens (2003) is unique in this literature because of the use of the Consumer Expenditure Survey's diary survey, where individuals keep track of their spending over a two-week period in a contemporaneously completed diary.

TABLE 2
*Spending Rates by Age Category (Percent)**

Age group	First wave	Second wave
29 or less	13.7	18.7
30-39	20.8	25.3
40-49	24.8	23.2
50-64	20.2	22.7
Age 64 or less	20.6	22.9
Age 65 or over	28.8	35.7

* Entries in the table are the weighted fraction of households receiving the rebate who reported that they would mostly spend the rebate.

3.2 Can We Explain Cross-Sectional Variation?

The fact that in Shapiro and Slemrod (2003) we can find little that systematically explains the cross-sectional variation in the spending rate might suggest that the answers given are essentially random. However, there were some systematic patterns. For example, those respondents age 65 and over were significantly more likely to spend. Table 2 shows the spending rates by age category in the first and second wave (discussed below). In both waves, the spending rate is significantly higher for those age 65 or over compared to everyone else. Shapiro and Slemrod (2001, Tables 10 and 11) suggest that the spending rate of those 65 or older is significantly higher than the rate of others, even when other respondent characteristics are held constant. This age pattern is entirely consistent with the life-cycle model.

As another example, the spending rate is positively related to expected business conditions. As Table 3 shows, in the first wave, those who expect the economy in a year to be good or good with qualifications had a spending rate of 26.2 percent, while those who expected the economy to be bad or bad with qualifications had a spending rate of 19.9 percent. For the

TABLE 3
*Spending Rates by Expected Business Conditions over the Next Year (Percent)**

Expected business conditions	First wave	Second wave
Good or good with qualifications	26.2	26.7
Neutral	11.8	34.0
Bad or bad with qualifications	19.9	17.7

* See note to Table 2. Few households are neutral.

second wave, the spending rates are 26.7 percent and 17.7 percent, respectively. Both differences are statistically significant. This difference is consistent with the behavior of forward-looking consumers, assuming that the aggregate performance of the economy is relevant for individuals' prospects. Below we discuss some additional attempts to understand the cross-sectional variation in spending rates.

With the retrospective survey results, we can explain further the cross-sectional variation along two dimensions. First, we can investigate whether the retrospective answers can be explained better than were the prospective or concurrent answers. Second, we can investigate the explanatory power of a few new questions added to the 2002 survey. In addition, we can examine the *HAR* survey for additional evidence.

3.2.1 Explaining Retrospective Spending Rates As in the first wave, there is no indication that low-income households were more likely mostly to spend the rebate. In fact, higher-income households were more likely to say that the tax rebate led them mostly to increase spending. The positive relationship between income and the spending rate is even more striking in the second-wave data. The difference in spending rates between the lowest and highest income groups was 6.5 percent (24.1 percent versus 17.6 percent) in the first wave. It is 11.4 percent in the second wave (33.2 percent versus 21.8 percent). Using the second-wave data, it is still true that there is no significant relationship between the average spend/save decision and one's personal finances compared to the previous year. As in the first wave, those who say that their financial condition is better than it was in the previous year are more likely to spend. In the first wave, the percentages were 23.0, 25.6, and 16.6, depending on whether the respondent is better off now, about the same, or worse off now. In the second wave, they were 26.7, 26.1, and 21.2. As in the first wave, however, there is no monotonic relationship between the spend/save decision and one's expected personal financial position the following year compared to the year of the survey.

There is a notable change in the spending rate when respondents are characterized by both their financial condition compared to the previous year *and* their expected financial condition the following year compared to the year of the survey. In Shapiro and Slemrod (2003, Table 3B), we detected no clear difference in the average spending rates between those who were temporarily in good financial condition or temporarily in bad financial condition. For example, those who considered themselves in temporarily good times (i.e., they thought themselves to be better off than the previous year, but expected to be worse off in the following year) have a spend percentage of 22.0, hardly different than the overall average.

In the second wave, however, the spend percentage of this group is 43.6, much higher than the overall average.

Next, we restricted the sample to those respondents who gave valid answers in both waves of the survey, which reduced the sample to 344 observations. We then ran regressions in pairs. In the first of each pair, the dependent variable was the answer given to the spending question in the first wave; in the second of the pair, the dependent variable was the (retrospective) answer given in the second wave. The independent variables were always the answers given in the first wave. One interesting pattern emerged from this exercise. The positive association with the spending rate of the feeling that tax cuts would improve either one's own situation or the economy holds only for the first wave. This finding could be caused by a reduced perceived salience of the tax cuts as an important economic factor by early 2002; in the late summer of 2001, the tax cuts (and rebates) were the focus of much attention, at least until September 11.

3.2.2 *New Questions to Assess Liquidity Constraints* We added three new questions to the 2002 survey module to understand better why the rebate led some families to consume more and why, for other families, this result did not hold. The three questions addressed the following hypothesis: at the time of the rebates, some families had become overextended in the sense that their asset position was too low relative to their income expectations. According to this hypothesis, these families would have been pleased to use the rebate to bolster their asset position, given the inertia of spending plans. The first of the three questions asked, "Has the amount (you / your family) regularly spend(s) increased considerably in the last two years?" To this question, 37.0 percent of the respondents answered yes. Next, we asked, "(Do you / Does your family) have enough income to sustain your current level of spending for the foreseeable future?" To this question, 79.1 percent said yes. According to our hypothesis, those who answer no to this question would be especially likely not to spend the rebate. Finally, we asked, "If (you / your family) were to have a financial setback, such as losing a job or facing a large unexpected expense, how difficult would it be for (you / your family) to cut back on your usual spending?" In response to this question, 21.1 percent said that it would be very difficult, 30.4 percent said that it would be somewhat difficult, 28.7 percent said that it would be slightly difficult, and 19.8 percent said that it would not be difficult. According to this hypothesis, those who find it difficult to cut back on their usual spending would be more likely to save the rebate rather than spend it.

Do the responses to these questions have a significant association with spend/save rates? Based on cross-tabulations, the answer is mixed. Those who had experienced a significant increase in spending were slightly more likely mostly to have spent the rebate: 26.1 percent versus 24.2 percent. This difference is not statistically significant. However, there is a clear and significant difference in spending rates between those who say that a spending increase is sustainable and those who say it is not sustainable. Of those who say it is sustainable, 26.7 percent mostly spent the rebate, while only 15.4 percent of those who say it is not sustainable mostly spent it. This difference is significant at the 99 percent confidence level. Finally, those who said that it would be very difficult to cut back spending if there were a financial setback were significantly less likely mostly to spend the rebate than people who gave one of the other three answers (19.2 percent versus 26.1 percent). There was no significant difference, however, in spending rates among those who answered that cutting back spending would be somewhat, slightly, or not difficult.

We have pursued the explanatory power of these variables by performing linear probability regressions. In each regression, we control for the log of income, dummy variables for stock ownership categories, marital status, and age categories. None of the answers to these three new questions has a statistically significant coefficient in explaining the spending rate. Thus, although the cross-tabulations suggest some support for this hypothesis, the regression analysis does not.

3.2.3 Further Evidence from the Post-9/11 Survey There is also no indication in the *HAR* survey that low-income people were more likely mostly to spend the rebate. In cross-tabulations, there is no significant relationship between spending rates and personal finances compared to the previous year or to personal finances expected the following year compared to the year of the survey. However, a linear probability analysis that holds income, wealth categories, age categories, and marital status constant does indicate that being in better financial condition than the previous year is associated with a higher spending rate.

As in the Survey of Consumers, one answer that is significantly associated with the spending rate is the respondent's assessment of the state of the national economy one year in the future. For those who say that it will be good or good with qualifications, the spending rate is 25.9 percent. For those who say that it will be bad or bad with qualifications, the average spending rate is 12.4 percent. (It is 16.4 percent for those who feel neutral about the national economy.) This estimated 13.5 percent difference is much larger than the difference in the Survey of Consumers and survives the inclusion of other variables in a multiple regression frame-

work. Thus, in terms of the ability to explain the cross-sectional differences in spending rates, a person's expectations of where the aggregate economy is headed seems to be much more powerful than his or her expectations about his or her own family's financial conditions.

3.3 Consistency of Answers Across Waves

The previous section documented that the two waves of the Survey of Consumers gave similar aggregate spending rates. A stronger check on the validity of the survey answers is a comparison of the answers given by the same people to the concurrent survey in 2001 and the retrospective survey in 2002. Table 4 shows the cross-tabulation of answers across the two surveys, while Table 5 shows the results of combining the "mostly increase saving" answers with the "mostly pay off debt" answers into a "don't spend" composite. If the correlation across waves were perfect, the diagonal elements of these tables, shown in bold, would contain all the observations. In fact, the correlation is substantial but not perfect. Of those who said in 2001 that the tax rebate led them mostly to spend the rebate, 61.8 percent repeated that answer in 2002. Of those who in 2001 said that it led them mostly not to spend it, 81.7 percent repeated that answer in 2002. The (first-wave) weighted correlation is 0.415, which is significant with 99 percent confidence. If we repeat the same calculation for only

TABLE 4
Relationship of Answers in First and Second Waves, All Responses
*(Number of Observations)**

	<i>Second wave</i>					<i>Total</i>
	<i>Mostly increase spending</i>	<i>Mostly increase saving</i>	<i>Mostly pay off debt</i>	<i>Did not get rebate</i>	<i>Don't know / refused</i>	
<i>First wave</i>						
<i>Mostly increase spending</i>	46.5	6.0	22.7	1.5	2.5	79.2
<i>Mostly increase saving</i>	20.0	55.2	17.0	6.2	4.0	102.4
<i>Mostly pay off debt</i>	21.0	17.2	94.2	12.7	2.0	147.2
<i>Did not get rebate</i>	2.2	3.0	8.2	43.7	2.7	60.0
<i>Don't know / refused</i>	2.0	1.2	1.0	1.5	0.5	6.2
Total	91.7	82.7	143.2	65.7	11.7	394.7

* Entries in the table are the (first-wave) weighted number of respondents.

TABLE 5
Relationship of Answers in First and Second Waves, Spend Versus Not Spend (Number of Observations)*

	<i>Second wave</i>		Total
	Mostly spend	Mostly not spend	
<i>First wave</i>			
Mostly spend	46.5	28.7	75.2
Mostly not spend	41.0	183.6	224.6
Total	87.5	212.3	299.8

* Entries in the table are the (first-wave) weighted number of respondents.

those 245 households who had already received the rebate when they were surveyed in 2001, the correlation rises to 0.439.

We would expect that responses to our question could be quite noisy. In addition to response noise due to the unfamiliarity of the question, the use of the term *mostly* could result in a respondent changing his or her response due to a small change in his or her assessment of the underlying spending propensity. Thus, given the nature of the survey and its subject matter, we conclude that there is a fairly high level of consistency of responses across waves.

3.4 Respondents' Horizon

If those respondents who report that the rebate led them mostly to save the rebate or mostly to pay down debt plan to use the extra saving or reduced debt to finance consumption in the near future, our findings would have very different implications than if the saving or debt repayment were more lasting. Two of the questions in the second wave of the Survey of Consumers directly addressed the question of whether an intention to save the rebate, for example, meant saving it for a purchase a few weeks or months later, or rather to add to one's assets over a longer period of time. In particular, those who answered that the rebate led them mostly to save were asked, "Will you use the additional savings to make a purchase later this year, or will you try to keep up your higher savings for at least a year?" The response was overwhelmingly the latter, with 85.3 percent choosing that answer. A similar question was asked of those who said they would mostly use the rebate to pay down debt: "Will you use the lower debt to make a purchase later on this year, or will you try to keep your lower debt for at least a year?" In this case, too, those surveyed overwhelmingly chose the latter answer: 93.4 percent, to be exact. Thus, the new survey evidence strongly suggests that the people who reported

mostly not spending the tax rebate largely intended the resulting increase in assets (or decrease in debt) to last at least a year.

4. THE TAX REBATES AND THE AGGREGATE ECONOMY

4.1 Tax Policy Changes and Aggregate Time Series Data

Aggregate time series analysis of tax policy changes is difficult because tax policy changes are rare occurrences and because they are potentially confounded by other events. Indeed, both the 2001 recession and the September 11, 2001, terrorist attacks are substantial confounding variables to studying the 2001 policy changes in time series. Such potential confounding variables were one of the reasons that led us to pursue the survey approach to studying the policy change. Nonetheless, in this section, we do examine the aggregate data to see what they might reveal about the effect of the tax policy, and to what extent the data are consistent with the survey results.

Table 6 shows the magnitude of the size of the rebates and the change in withholding as a result of the 2001 tax bill from official, static revenue estimates. The rebate payments were spread mainly over July, August, and September, with a peak in August. There was a more modest reduction in withholding during the second half of 2001, which was a result of the 0.5 percentage point reduction in tax rates for the old 28 percent

TABLE 6
*Aggregate Change in Tax Payments (Billions of Dollars, Annual Rate)**

	Rebate	Withholding	Total
<i>2001</i>			
July	81.4	13.7	95.1
August	209.4	13.7	223.1
September	131.2	13.7	144.9
October	2.5	13.7	16.2
November	5.0	13.7	18.7
December	2.5	13.7	16.2
<i>2001</i>			
Calendar year	36.0	6.9	42.9
<i>2002</i>			
Calendar year	0.0	52.0	52.0

* Table shows changes in tax payments due to changes in the 2001 tax bill. Figures are annual rate; i.e., the 2001 calendar year figure is half the average of the July through December numbers.

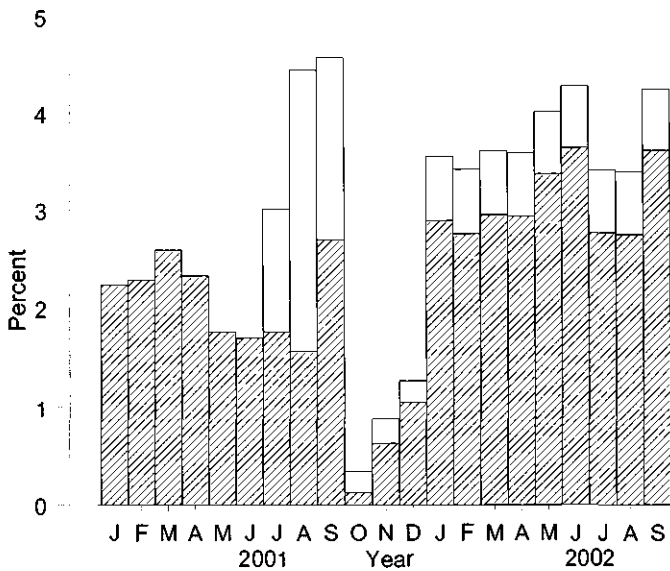
Sources: For 2001, BEA Personal Income releases. For 2002, *Budget of the United States* (January 2002).

and higher brackets. The reduction was implemented as a 1 percentage point reduction in withholding, effective in July 2001. The 2002 tax cuts were larger than those in 2001, but they accrued evenly throughout the year. In 2002, the amount corresponding to the rebate was implemented as lower withholding for the new 10 percent bracket; the rate reduction of 1 percentage point for the upper brackets applied throughout the year.

The rebates in July, August, and September 2001 were sizable relative to aggregate tax payments and aggregate disposable income. For the first two quarters of 2001, National Income and Product Accounts (NIPA) personal tax and nontax payments averaged \$1,338.3 billion at an annual rate. During the third quarter, they averaged \$1,181.9 billion, a reduction of 12 percent. The rebates were 1.1 percent of disposable income in July, 2.8 percent of disposable income in August, and 1.7 percent of disposable income in September.

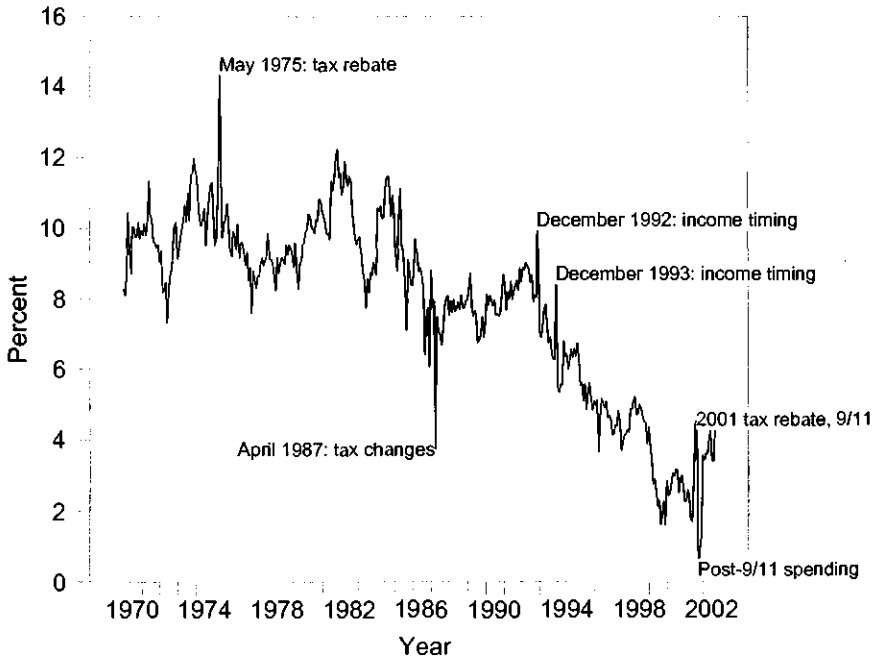
Our survey results suggest that most households mostly saved the rebates. How does that conclusion accord with the aggregate data? Figures 1 and 2 show monthly personal saving as a percentage of disposable personal income. For the first six months of 2001, Figure 1 shows that the saving rate averaged about 2 percent. Figure 2 shows that this low saving rate was the culmination of a decline in the saving rate that began in the

FIGURE 1. Personal Saving Rate, January 2001–July 2002*



*The unshaded top area is the portion of saving accounted for by tax changes.

FIGURE 2. *Personal Saving Rate, 1970–2002*



1980s but accelerated in the middle of the 1990s. Figure 1 shows a spike in the saving rate precisely at the same time the tax rebates were mailed in July, August, and September 2001. This spike in saving is consistent with the finding of our survey that most households mostly saved the rebate.⁵

Is the spike in saving due to the rebate? Figure 1 decomposes the total personal saving rate into two parts, beginning in July 2001. The unshaded, top area is the reduction in personal tax payments due to the change in policy, i.e., the amounts shown in Table 6 as a percent of disposable income. The total height of the bars in Figure 1 is the official personal saving rate; so the shaded area is simply the saving rate excluding the policy-induced changes in tax payments. The pattern of Figure 1 is consistent with a finding that, in July and August 2001, a sizable fraction of the tax rebates went straight into saving. The spike in the saving rate, which is

⁵ The personal saving rate has come under criticism recently as a measure of saving because, among other reasons, it excludes capital gains. See Gale and Sabelhaus (1999). Though this criticism of the saving rate may be important in some contexts, here it is a convenient indicator of how the flow of spending moved contemporaneously with the flow of income. We will also consider below measures of aggregate consumption expenditure.

very noticeable even in Figure 2 over the longer time series, is fully accounted for by the decrease in tax payments. Excluding the tax changes, the saving rate in July and August would have been very similar to the rate in the first half of the year, all other things being equal.

The situation becomes much more complex beginning in September 2001. The saving rate remains high. The high rate relative to the first half of the year is accounted for partially by the decrease in tax payments, but the dark-shaded residual also shows an increase. This blip downward in consumption relative to income is likely due to a reduction in spending while the nation's attention was riveted on the terrorist attacks. October saw a recovery in spending in all categories of consumption, but especially for automobiles in response to the zero percent financing incentives offered by automobile companies.

Figure 3 charts total personal consumption expenditures and their major components in chain-weighted 1996 dollars. The shaded areas show July, August, and September 2001, when the rebate was mailed. Several facts emerge from these charts:

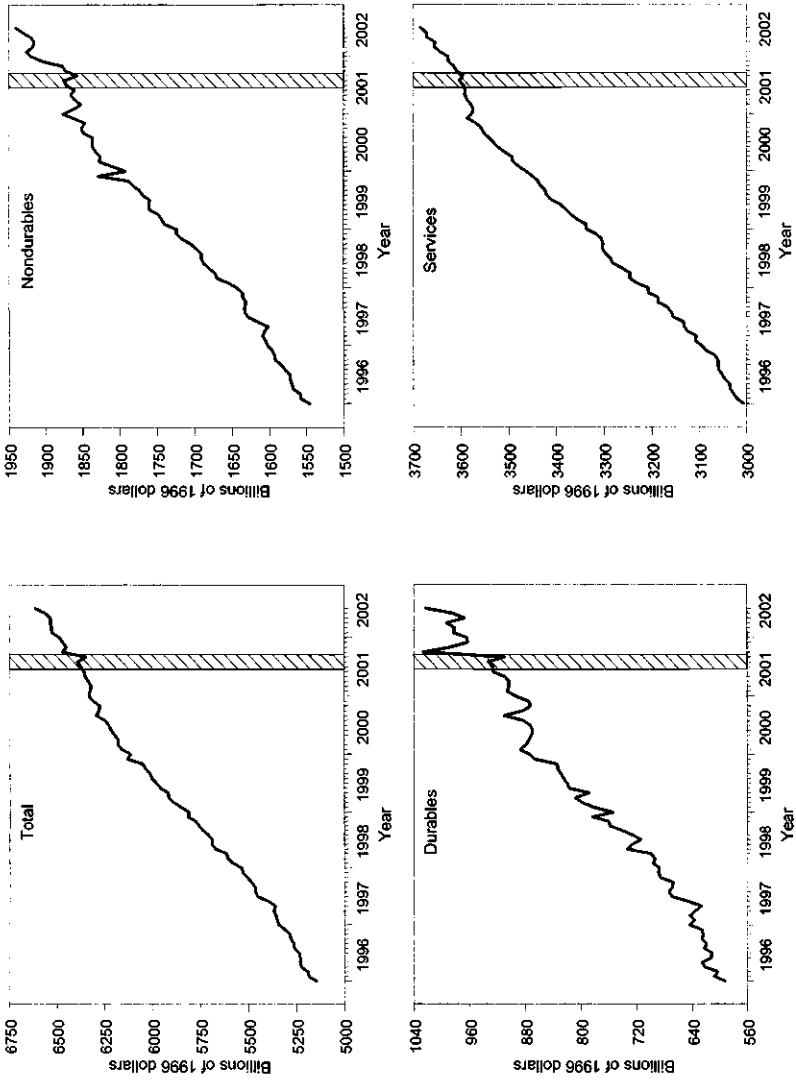
- Consumption growth discernibly slowed by late 2000 from its robust rate of the late 1990s. This slowdown apparently antedates the NBER reference peak of March 2001.
- There is no discernible movement upward in consumption during the period of the rebate.
- The 9/11 spike downward in spending and the spike upward in October is clear.

Hence, consumption expenditures tell the same story as the saving rate.

It is possible that the decline in saving in the fourth quarter of 2001 reflects to some degree the smoothing of spending from the rebates over the second half of the year. This seems unlikely, however, on two counts. First, the presence of post-9/11 incentives to purchase automobiles is a more direct explanation of the decline in saving in the fourth quarter. Second, the decline ended abruptly in 2002, with the saving rate appearing to be higher than its pre-rebate level. Hence, the 2002 saving rate does not suggest deferred spending from 2001.

All in all, Figures 1 and 2 support the proposition that virtually all the tax cuts went into personal saving, especially for July and August 2001 prior to the confounding event of 9/11. This mechanical calculation is consistent with the implication of the survey that most of the rebate was saved. To be sure, care must be taken in interpreting the finding in terms of an economic model. For example, consumption smoothing would man-

FIGURE 3. Personal Consumption Expenditures*



*Shaded area is July through September 2001 when rebates were mailed.

date a spike in saving on receipt of the rebate. Yet the aggregate data appear to be telling a very similar story to that of the survey.

4.2 *Previous Episodes*

The Tax Reduction Act of 1975 provided a temporary 10 percent rebate on 1974 taxes, up to a maximum of \$200. The rebate was mailed from late April to mid-June 1975. Blinder (1981) finds that each rebate dollar raised consumption by about \$0.16 in the quarter when it was received and that it had larger effects in later quarters. Modigliani and Steindel (1977) find much smaller effects. Poterba (1988) finds that consumption of nondurables increased by between 18 and 24 percent of the rebate in the month when it was received, but he also finds that the change in service consumption was negligible. Hence, these studies of the 1975 rebate generally find modest spending from the rebate. Of course, the 1975 rebate corresponded to a temporary tax cut, which the standard theory suggests should be saved.

Note that Figure 2 indeed shows a dramatic spike up in saving contemporaneously with the receipt of the 1975 rebates. This spike corresponds to a temporary drop in tax receipts; the increase in disposable income did not generate a corresponding increase in consumption, so the saving rate spiked (Bureau of Economic Analysis, 1975). The other big spikes in the saving rate since 1975 (see Figure 2) can also be associated with tax changes. In April 1987, there is a spike down in the saving rate. This decrease corresponds to the decrease in disposable income associated with the final settlements of 1986 tax liabilities. The 1986 tax bill led to an acceleration of capital gains realizations that increased final settlements. There were also changes in withholding (decreases in the first quarter of 1987 and increases in the second quarter of 1987) as individuals adjusted withholding to the new, lower rates (Bureau of Economic Analysis, 1987).

There are also more modest, though still noticeable, spikes up in the saving rate in December 1992 and December 1993. These spikes occurred because individuals and firms moved the payment of income forward in time (e.g., via Wall Street bonuses) because of the anticipation of tax increases. In 1992, the election of President Clinton and statements by incoming members of his administration led to an expectation of tax increases. The Omnibus Budget and Reconciliation Act of 1993 increased marginal tax rates. It also increased the base for Hospital Insurance (HI) payroll taxes beginning in tax year 1994 by making HI-covered earnings subject to the combined employer/employee tax rate of 2.9 percent.⁶ This

⁶ See *Economic Report of the President* (1994) and Parcell (1999) for more details.

change provided an incentive to taxpayers to shift earnings from 1994 to 1993.⁷

Other factors, of course, contribute to swings in the saving rate. For example, swings in farm income are substantial in 1987 and 1993 (Bureau of Economic Analysis, 1987, 1994). Nonetheless, swings in disposable income associated with tax changes do coincide with the biggest spikes in the saving rate in Figure 2. Hence, in 1975, 1987, 1992, 1993, and 2001, there are spikes in saving that are consistent with individuals smoothing consumption over temporary changes in disposable income arising from tax changes, or changing the timing of income so that tax liabilities are minimized.

4.3. Converting Survey Responses into an Aggregate MPC

The aggregate marginal propensity to consume (MPC) from the rebate is an important input for studying the aggregate impact of the tax rebate. Our survey does not provide the MPC directly. Instead, it offers self-reported estimates of the fraction of people who would either mostly spend the rebate or mostly save it, either by adding it to assets or repaying debt. We could have inquired about the MPC directly on the survey by asking the following question: "What fraction of the rebate did you spend?" In designing our survey instrument concerning the 1992 rebate, we decided that asking about a fraction was too complicated.⁸ We used the same design decision for the survey instruments concerning the 2001 rebate.

With some assumptions about what range of individual MPCs corresponds to mostly spending or mostly saving and the distribution of those individual MPCs, our aggregate answers can be converted to an aggregate MPC. Under extreme assumptions, the correspondence need not be close and could even be misleading. For example, if "mostly spend" corresponds to an MPC of 0.51 and "mostly not spend" corresponds to an MPC

⁷ This income shifting is captured in official statistics. To put the National Income Accounts on an accrual basis, the Bureau of Economic Analysis routinely estimates wage accruals less disbursements (WALD) to distinguish between the timing of payments and when the payments are earned. From 1959 to 1991, the maximum WALD in any quarter was \$2.5 billion at a seasonally adjusted annual rate. In over half of the quarters over this period, the WALD was zero. In contrast, the WALD in the fourth quarter of 1992 was -\$63.0 billion, which was largely offset in the first quarter of 1993 by a value of \$72.1 billion. Similarly, in the fourth quarter of 1993, the WALD was -\$50.2 billion, and in the first quarter of 1994 it was \$56.4 billion. The saving rate shown in Figures 1 and 2 (as well as in BEA releases) is on a disbursement basis; the increased disbursements match the spike in saving at the end of 1992 and the end of 1993.

⁸ Given the tendency of survey respondents to "heap" on round numbers, e.g., 0, 50-50, and 100 percent, it is not clear that asking about fractions would have given less lumpy and more informative data.

of 0.49, then the aggregate MPC is close to 0.50, regardless of what our survey reveals. The survey is thus uninformative. Seidman and Lewis (2002) consider another extreme case in which all households have an MPC of 0.40, which is therefore equal to the aggregate MPC. Our survey would conclude, however, that no one intends mostly to spend the rebate. In this hypothetical case, our survey would be misleading; of course, this hypothetical situation does not characterize the actual survey results.

More generally, it is reasonable to expect that there is a distribution of individual marginal propensities to consume between 0 and 1 that is neither bunched right around 0.50 nor entirely at values of either 0 or 1. By making some plausible assumptions about the shape of this distribution, we can estimate the range of average, or aggregate, MPCs that is consistent with what the survey reveals. For example, what if the probability density of individual propensities to consume is highest at a value equal to the fraction of people who mostly spend and falls off linearly on both sides of this value? In the appendix, we show that, with these assumptions, only values of the average MPC between 0.340 and 0.372 are consistent with one-quarter of the population having an MPC of 0.50 or less. Note that the aggregate MPC in this example is always greater than the fraction of people who mostly spend the rebate, but it lies within a fairly small range.

4.4 Bush Administration Estimates of the Aggregate Impact of the Tax Changes

Did the tax rebate policy cause output to be higher in the second half of 2001 than it would have been otherwise? Although an analysis of this question is well beyond the scope of this paper, our finding that most households mostly saved the rebate is potentially important for such an analysis. A Keynesian analysis would imply little aggregate stimulus if little of the rebate was spent. Similarly, because households perceived little change in wealth or government spending from the change in tax policy, it is hard to see how a classical analysis of the policy change would imply much short-run effect on aggregate outcomes.⁹ That is, a policy that moves assets from the government's balance sheet to private balance sheets with little perceived change in household well-being would be hard pressed to generate aggregate effects in the framework of a classical model. Hence, the results of our survey do suggest that the 2001 change in tax policy did not greatly stimulate aggregate output.

⁹ See Shapiro and Slemrod (2003) for the finding about household perceptions of future tax policy.

The Bush administration claimed, however, that the tax bill did provide a substantial short-run stimulus to the economy. According to a Council of Economic Advisers (CEA) white paper:

The tax relief also has provided valuable stimulus to economic activity in the short run. The quick enactment last year of the President's tax relief plan softened the recessionary headwinds in 2001 and has helped to put the economy on the road to recovery in 2002 (Council of Economic Advisers, 2002).

Specifically, the CEA estimates that the provisions of the tax bill added 1.2 percentage points (at an annual rate) to GDP during the last two quarters of 2001 and 0.5 percentage points to GDP during 2002. The CEA estimates were based on the total impact of the tax policy of \$57 billion in 2001 and \$69 billion in 2002.¹⁰ The majority of these amounts come from the rebate in 2001 or the impact of the new 10 percent bracket in 2002. Because GDP in 2001 was about \$10 trillion, the CEA estimates imply that tax policy left GDP about \$60 billion higher by the end of 2001 and \$112 billion higher by the end of 2002 than it would have been without the tax cut. These numbers imply that the tax cut raised GDP roughly dollar for dollar in the second half of 2001, and with a multiplier substantially above 1 in 2002.

The CEA provided us with the main details for its calculation.¹¹ The rebate was assumed to be half temporary (corresponding to the retroactive benefit of the 10 percent bracket from January to midyear) and half permanent (corresponding to the permanent benefit of the 10 percent rebate from midyear and into the future). Changes in withholding and other tax changes were assumed to be permanent. The policy was analyzed via the Macroeconomic Advisers model. According to CEA staff, the model has an effective marginal propensity to consume (MPC) from permanent tax changes of about 0.5, an effective MPC from temporary changes of about 0.15, and a multiplier of about 2. The simulation assumed that Federal Reserve interest rate policy was unaffected by the tax policy change.

Based on this description of how the policy was analyzed, it is easy to understand how the administration arrived at estimates of the impact of the tax policy. How credible are these estimates? The results of this paper can shed light on this question only in regard to the spending of the re-

¹⁰ These figures include initial reductions in the marriage penalty and changes in child credits not included in Table 6. Also, there is a \$1.1 billion inconsistency in the change in withholding in 2001 between Table 6 and the estimate in the budget, on which the CEA estimate is based.

¹¹ This account of the CEA methodology is based on telephone conversations with two CEA senior economists on February 20, 2002.

bate. The CEA assumed that about one-third of it was spent; that is, half was subject to the MPC for permanent income changes of 0.5 and half was subject to the MPC for temporary changes of 0.15. As discussed above, our survey finding that about one-quarter of households reported mostly spending the rebate could well be consistent with an aggregate MPC of one-third.¹² Although arrived at via a different route than our survey's results, the CEA's assumption about the spending of the rebate is thus consistent with our survey finding.

The CEA's finding that the tax changes were substantially stimulative rests on applying a large multiplier to a relatively modest impetus to spending. The assumption that the Federal Reserve held interest rates constant also contributed to the finding of substantial stimulus. An alternative and perhaps more plausible assumption is that the Federal Reserve cut interest rates less in 2001 than it would have otherwise because, in setting its targets, it took into account the effect of the tax cut on aggregate demand. For example, if the Federal Reserve has a target path for nominal GDP, it will attempt to offset changes in fiscal policy by adjustments in monetary policy. Under this scenario, even a Keynesian analysis would suggest that the tax cuts would not increase GDP but would instead change the fiscal/monetary mix in the short run.

The administration did not initially highlight short-run economic stimulus as a main objective of the tax policy. Indeed, congressional Democrats introduced the rebate policy, partly as a stimulus measure. It is not surprising, especially in light of the economic slowdown in 2001, that the administration would claim that the tax cut gave the economy a boost.

It is interesting to know that the Bush administration bases its policy analysis on neo-Keynesian macroeconomic models with substantial multipliers. The administration use of these models may come as a surprise to some of its supporters. Yet the use of neo-Keynesian macroeconomic models for policy analysis is common practice at the CEA and is consistent with how analysis has been carried out in previous administrations.

5. CONCLUSION

The tax rebates sent out in the summer and early autumn of 2001 were a small part of the 10-year tax cut bill that became law earlier that year.

¹² The CEA assumed that withholding changes were permanent. Because they did correspond to changes in tax rates that would be in place under current legislation, this assumption, taken at face value, is reasonable. Our survey results do suggest, however, that many households did not perceive the tax bill as providing a permanent benefit, so this finding would argue for a lower MPC. On the other hand, according to the CEA, the macroeconomic model assigns an MPC from permanent income changes of one-half, well below the value of one mandated by the standard theory.

Although not originally part of the tax cut plan, one part of the tax cut for 2001 was converted into checks sent out to taxpayers rather than reductions in withholding when an economic slowdown became more apparent. One might speculate that incumbent politicians also guessed that household-voters would be more likely to recall their largesse if the tax cut took the form of a tangible check as opposed to, for example, a reduction in tax withholding.

Did the rebates work as a counter-recession policy? The answer to that question depends in part on households' propensity to consume the increased disposable income due to the rebates. Our survey-based research suggests that the spending rate was quite low compared to the expectations of many economists. This finding appears in a contemporaneous survey and a retrospective survey that addressed the actual rebate plan. It also appears in answers to what would be the response to a hypothetical survey conducted soon after September 11, 2001. An examination of the NIPA data is completely consistent with a small impact on consumption. Because it is impossible to know what consumption would have been without the rebates, however, aggregate analysis cannot be definitive. Nonetheless, that the counterfactual in aggregate data gives a similar result to the counterfactual that we pose to survey respondents is a significant validation of the survey methodology.

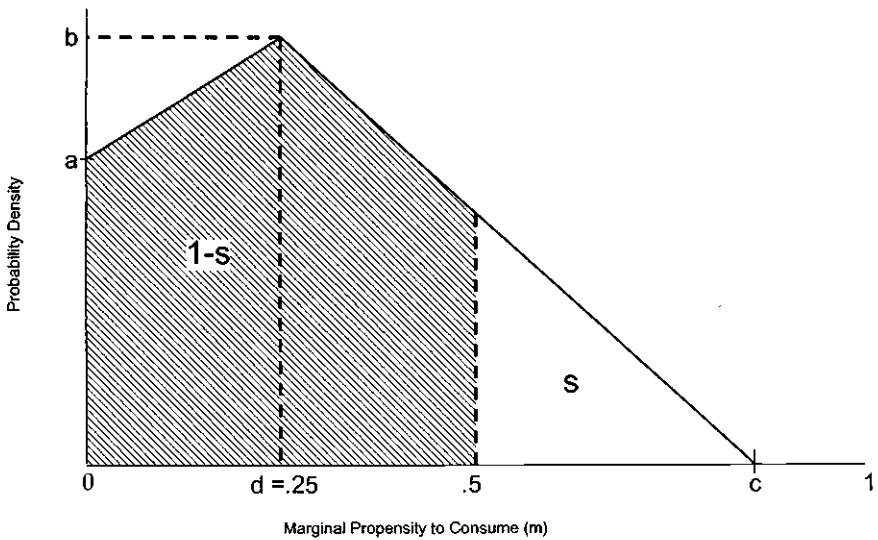
APPENDIX

Let s be the fraction of people who are spenders, defined as people for whom the marginal propensity to spend, call it m , is greater than or equal to 0.50. Assume that the probability density of m looks like Figure 4. In particular, assume there is a non-negative probability density equal to a of having $m = 0$, and that the probability density increases linearly until it reaches a peak of b at $m = d$, after which it decreases linearly until it reaches 0 at $m = c$. (Note that a , b , c , and d are not independent because $\int_0^1 f(m)dm = 1$.) With these assumptions, we can calculate the relationship between the aggregate marginal propensity to consume, $\bar{m} = \int_0^1 mf(m)dm$, and the parameters a , b , c , and d for a given value of the average spending rate, $s = \int_0^1 f(m)dm$. Note that this exercise also assumes that all individuals have equal income or, more specifically, equal weight in calculating the aggregate marginal propensity to consume.

Table 7 shows the results of some calculations of \bar{m} for various combinations of a , b , and c , with the additional assumption that the modal m is equal to the approximate value of the fraction of people who mostly spend, so that $d = s = 0.25$.¹³ (Note that, given these assumptions, c can

¹³ Allowing d to vary between 0.15 and 0.35 does not have a large effect on \bar{m} .

FIGURE 4. Illustrative Distribution of Individual Marginal Propensities to Consume



equal 1 only in the case where the density function has a constant negative slope, so that the maximum density occurs at the minimum value of $m = 0$, in which case, m is 0.333. See Figure 4.) According to these calculations, the aggregate MPC, or, \bar{m} , falls within a fairly tight range, from 0.340 to 0.372. It is always greater, however, than the assumed value of s , the fraction of people who mostly spend the rebate.

TABLE 7
*Implied Values of the Aggregate Marginal Propensity to Consume (\bar{m}) for Alternative Distributions of the Individual Marginal Propensities to Consume (m)**

a	b	c	\bar{m}
1.643	1.643	0.967	0.340
1.558	1.678	0.960	0.341
1.300	1.782	0.940	0.346
1.011	1.899	0.920	0.351
0.688	2.031	0.900	0.358
0.321	2.181	0.880	0.365
0.000	2.314	0.864	0.372

* See discussion in the text and the appendix. The distribution of m is parameterized as in Figure 4.

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