

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
DIVISION OF RESEARCH AND STATISTICS

Date: February 29, 2008
To: Dave Stockton
From: Wendy Edelberg and Claudia Sahm
Subject: Proposal for March Greenbook Spending Response to 2008 Rebate

We have updated a number of the assumptions underlying our projection of the PCE response to the 2008 tax rebate. The table below summarizes the effect of these updates on our PCE forecast. Most importantly, we now assume a more immediate and faster distribution of rebate checks (see memo lines). This pulls forward the PCE response to the rebates, boosting our projection of PCE growth in the second and third quarters of this year and sharply reducing PCE growth in the fourth quarter. Below we briefly summarize the changes to our assumptions. For interested readers, we also include a section discussing in more detail how we arrived at these changes.

Table 1: Real PCE response to 2008 tax rebate

	2008			2009				2008Q4/	2009Q4/
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2007Q4	2008Q4
Level (a.r., billions)									
Current	29	102	28	5	13	7	0	40	6
January GB	0	44	85	43	2	2	2	32	12
Growth rate (a.r.)									
Current	1.4	3.5	-3.5	-1.1	0.3	-0.3	-0.3	0.3	-0.3
January GB	0.0	2.1	2.0	-2.0	-2.0	0.0	0.0	1.0	-1.0
<i>Memo:</i>									
Nominal tax rebate (quarterly figures at quarterly rate, billions)									
Current plan	78	19	3	7	6	0	0	100	13
January GB assumptions	0	75	0	0	0	0	0	75	0

Revisions since last Greenbook

The revisions since last Greenbook reflect new information about the size, timing, and speed of the rebate. In addition, we have revised our assumptions regarding households' MPCs and spend-out rates.

Size of Rebate

Whereas last Greenbook we projected that the rebate would total \$75 billion, the final package passed by Congress is considerably larger, totaling \$113 billion, as shown in the final columns in the memo lines of the table.

Timing/Speed of Rebate

The rebates will be sent out beginning in May, earlier than we had expected last Greenbook. In addition, Treasury also expects to deliver the bulk of the rebate more quickly than previously thought, such that we will see the biggest effect on income in 2008Q2.

Marginal Propensity to Consume

We have lowered our projected aggregate MPC out of the rebate to 0.5 from 0.67 last Greenbook.¹ This change is based both on new information about the distribution of the rebate (it is skewed more toward middle-income households than we had assumed) as well as a reconsideration of the existing literature and our empirical estimates.

Individual Spend-out Rates

Our reading of the literature and the performance of our models in recent rebate episodes led us to assume a more rapid spend-out rate than that implied by the Elmendorf tent, which we had used in the January Greenbook.² Combined with the faster and more immediate distribution of rebate checks, this implies a more front loaded aggregate spending response.

Further Details

Given the existing literature and our own empirical estimates (described below), we view the plausible range of the short-run aggregate MPC out of a rebate as 0.3-0.4 at the low end to 0.6-0.8 at the high end. Relative to the effect of recent tax rebates, we might expect a smaller MPC with this stimulus package because the 2008 rebate is a purely transitory boost to income and is not accompanied by any permanent reduction in taxes. In contrast, we might expect a higher MPC and a faster spend-out as this package distributes a larger share of the rebate to low-income households. Both the literature and our models (described below) suggest a slightly faster spend-out rate than we had previously assumed. We now assume that 60 percent of the spending response occurs in the first three months of rebate receipt and that the remaining 40 percent occurs in the

¹ Note that this assumption implies that $\frac{1}{2}$ of the rebate is *not* spent, but instead used to pay down debt or increase financial assets. We assume that this relatively minor increase to net worth will have the usual implications for the PCE forecast, and we currently do not parse these effects on PCE growth as rebate effects. The estimates in Table 1 for the January Greenbook do include a small effect for life-cycle spending.

² The Elmendorf tent described our assumed timing of the PCE response to the 2001 tax rebate and incorporated *two* assumptions. The first assumption concerned the speed with which rebates would be distributed to households. The second assumption concerned the spend-out rate by households. Glenn Follette has backed out estimates of household spend-out rates underlying the tent using the aggregate spending response dictated by the tent and the timing of actual check disbursement.

succeeding three months. The Elmendorf tent implied a 40, 50, 10 percent spend-out rate over the first, second and third three-month periods after rebate receipt. Early indicators of spending responses from the University of Michigan survey are similar to spending responses in that survey in recent episodes.

Summary of Research on 2001 and 2003 Rebates

Using the Consumer Expenditure Survey, Johnson, Parker, and Souleles (2006) estimate that in 2001 households spent 20 to 40 percent of their rebate on nondurable expenditures in the three-month period when they received their rebate.³ With one set of dynamic specifications, they estimate that households spend 40 percent of their rebate on nondurable expenditures within three months, 65 percent within six months, and 70 percent within nine months. However, the statistical precision in the estimated spending responses over longer horizons decreases substantially. Examining the average spending response across income groups, they find that households in the bottom third of the income distribution exhibit the largest (and only statistically significant) increase in spending. However, Johnson et al.'s point estimates also hint at a U-shaped response, with a larger spending response also among high-income relative to middle-income households.

Shapiro and Slemrod (2003a, 2003b) designed questions for the Michigan Survey of Consumers that ask respondents whether the rebate in 2001 will primarily lead them to increase spending, increase saving, or pay off debt. From the initial surveys in August through October 2001, Shapiro and Slemrod find that 20 percent of respondents will mostly increase their spending and this fraction rises to 25 percent for those who have already received the rebate. These responses do not uniquely map to an aggregate MPC, but with a simple distributional model, Shapiro and Slemrod calculate a range for the implied aggregate MPC of 0.34 to 0.37 (2003b). Using measures of current income and stock holdings, previous and expected financial conditions, and other proxies for liquidity constraints, they find few sources of systematic variation in the spending response across households. Indeed, Shapiro and Slemrod's results suggest that liquidity constrained households are no more likely to spend the rebate than unconstrained households and that high-income households exhibit *higher* propensities to spend. However, Shapiro and Slemrod do find that the rebate is more likely to be spent by individuals over age 65 and less likely to be spent by those who are pessimistic about expected business conditions.

Using similar questions in the Michigan Survey of Consumers in 2003, Coronado, Lupton, and Sheiner (2005) also find a modest spending response to the 2003 child tax credits, estimating an aggregate MPC of 0.3. They estimate household-specific MPCs

³ The lower estimate only uses the random variation in the timing of the rebate receipt; the larger (statistically significant) estimate also depends on a comparison to households who do not receive a rebate. Households report their expenditures over the previous three months and the month of their rebate receipt. Johnson et al.'s estimate of the spending response averages over households who received their rebate at different times in the reference period and is not the same as the response within three months of receipt.

with a latent variable model and then use the distribution of rebate income to compute the aggregate MPC. Their results also suggest that high-income households have a higher (and statistically significant) propensity to spend out of the rebate. They also find no difference in the spending response to lower tax withholding versus receipt of a rebate check.

The usefulness of self-reported plans depends crucially on how individuals define their baseline spending and how accurately they assess their response to the additional income. A follow-up survey in 2002 partially addresses the latter concern by asking those who would mostly increase their saving or pay down debt whether they plan to later increase their spending. More than 85% of those who intended to mostly pay down debt or mostly save the rebate confirmed in the follow-up question that they were committed to this behavior for at least a year.

In contrast to these self-reported plans, Agarwal, Liu, and Souleles (forthcoming) use monthly credit card account information to show that some account holders initially reduce their credit card balances after the rebate receipt, but then subsequently increase their spending. However, many of the results in this high frequency event study are imprecisely estimated and the data may not be representative of all rebate recipients or their overall spending response to the rebate. Nevertheless, Agarwal et al (forthcoming) argue that households who appear to be liquidity constrained have the largest cumulative spending responses to the rebate.

Empirical Effects of 2001 and 2003 Rebates in the MCR-PCE Models

In 2001, \$37 billion in 2000 dollars (or \$148 billion at an annual rate) in rebates were distributed from July to November, and real DPI growth surged at an annual rate of 11½ percent in 2001Q3. The aggregate spending response appears to have occurred in 2001Q4, owing to a spike in motor vehicle spending in October. In 2003, \$13 billion in 2000 dollars (or \$52 billion at an annual rate) was disbursed in child credit rebates from July to September. The spending response in 2003 appears to have occurred in 2003Q3 and to have been more evenly spread across PCE categories.

The forecast errors from our aggregate PCE model in these two episodes suggest that the boost to spending from the rebates occurred quite quickly and was substantially larger than the usual short-run response of spending to a change in disposable income.⁴ To estimate an aggregate MPC out of the rebates, we simulated our baseline model using an income path that excluded the temporary boosts provided by the rebates. These model simulations under-predict the level of real PCE in 2001Q4 by about \$80 billion and in 2003Q3 by about \$40 billion but have only small forecast errors for the level of PCE in the quarters following the spending surges. One way to completely explain away these

⁴ These models assume that a 1 percent rise in real DPI growth leads to a contemporaneous rise of about ¼ percent in real PCE growth (sometimes interpreted as our estimated fraction of rule-of-thumbers). The MCR-PCE estimate of rule-of-thumb spending has decreased from one-half of total consumption in 2001 to one-quarter in 2003, where it currently remains. Most of the decline in this estimate is attributable to changes in the PCE model.

forecast errors is to assume that households spent 60 percent of the 2001 rebate and 80 percent of the 2003 rebate.

However, we view these implied MPCs as upper bound estimates because they may also reflect a quicker-than-expected speed of adjustment to the permanent component of the tax packages. In addition, sharp movements in motor vehicle spending, particularly in 2001 when all of the spending surge can be attributed to motor vehicles, suggest a role for other factors than the rebate income in explaining the spending surprises. As a result, we are more comfortable being below these model estimates of the MPC out of tax rebates and in the middle of the range from the household-level studies.

Early Indicators of the 2008 Spending Response

In February, the Michigan Survey of Consumers asked individuals how they plan to use their 2008 rebate income. One-fifth of respondents (who expect a rebate) plan to mostly spend their rebate this year. In contrast, 50 percent plan to mostly pay off debt with their rebate and 30 percent to mostly increase their saving. However, the fraction of spenders rises to 30 percent when including the initial savers (and debt re-payers) who in a follow-up question report plans to spend the rebate later this year. These responses to the 2008 rebate are comparable to the responses in 2001 and 2003 and would suggest an aggregate MPC of about 0.3-0.4.

References

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