

A Model of the Consumption Response to Fiscal Stimulus Payments

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Executive Summary

Fiscal stimulus payments (i.e., government transfers to households such as tax rebates) are frequently used by governments to alleviate the impact of recessions on households' welfare. In the last decade, this type of fiscal intervention was authorized by U.S. Congress in the downturns of 2001 and 2008.¹ Households received one-off payments that ranged from \$300 to \$1,000, depending on household composition and on their income level. In the aggregate, these fiscal outlays were remarkably large: \$38B in 2001, \$79B in 2008, and \$60B in 2009, roughly equivalent to 0.5% of annual GDP.

On the empirical side, substantial progress has been made in measuring the size of household consumption responses to the tax rebate episodes of 2001 and 2008. Using a special module added to the *Consumer Expenditure Survey*, Johnson, Parker, and Souleles (2006), Parker, Souleles, Johnson, and McLelland (2011), and Misra and Surico (2012) cleverly exploit the randomized timing of the receipt of payments to estimate the effects of the fiscal stimulus payments on consumption expenditures.² Shapiro and Slemrod (2003, 2009) substantiate these studies with a detailed qualitative survey on how consumers use their rebate.

For the 2001 episode, for example, comparing consumption expenditures of the “treatment” group (i.e., households who receive the rebate check) and “control” group (i.e., households who are, arguably, aware of the rebate but have not yet received their check) reveals that the former group consumes between 20 and 30 percent of the rebate check on nondurables goods and services in the quarter that the rebate is received.³

Two crucial facts are encoded in this finding: 1) the marginal propensity to consume (MPC) out of the extra cash is large; 2) the MPC out of the news of the extra cash is small. Both facts

¹In the context of the latest downturn, Oh and Reis (2011) document that, contrary to common belief, the large fiscal expansion of 2007-09 consisted primarily of growing social assistance, as opposed to government purchases. Half of this expansion comprised of discretionary fiscal stimulus transfers.

²In both 2001 and 2008, the Treasury disbursed payments over a span of six months in a sequence based on the last two-digit of the SSN of the tax filers.

³Nondurable goods and services include food (at home and away), utilities, household operations, public transportation and gas, personal care, alcohol and tobacco, miscellaneous goods, apparel good and services, reading materials, and out-of-pocket health care expenditures.

are at odds with “off-the-shelf” consumption theory. The rational expectations, life-cycle, buffer-stock model where households can save and borrow through a single risk-free asset up to a limit— predicts that the MPC out of anticipated transitory income fluctuations, such as tax rebates, should be negligible. Moreover, the MPC out of the news of extra income should be very similar to the MPC out of extra income. In this standard model, the only agents whose consumption would significantly react to the receipt of a rebate check are those who are liquidity constrained. However, under parameterizations where the model’s distribution of net worth is in line with the data, the fraction of constrained households is too small (around 10 percent) to generate a big enough response in the aggregate.

In spite of this large body of empirical research, and the obvious difficulties of standard theory in accounting for the facts, there are virtually no quantitative studies of these episodes within structural, dynamic models. Such a gap in the literature is troubling because thoroughly understanding the effectiveness of tax rebates as a short-term stimulus for aggregate consumption is paramount for macroeconomists and policy makers. Knowing the determinants of how consumers respond to stimulus payments helps in choosing policy options and in understanding whether the same fiscal instrument can be expected to be more or less effective under different macroeconomic conditions.⁴

To address these questions, we propose a structural model that integrates insights of the classical Baumol-Tobin model of money demand into the workhorse life-cycle, buffer-stock framework. In our model, households can hold two assets: a liquid asset (e.g., cash, or bank account) and an illiquid asset (e.g., housing, or retirement account). Illiquid assets earn a higher return but can be accessed only by paying a transaction cost.⁵ The model is parameterized to replicate a number of macroeconomic, life-cycle, and cross-sectional targets. The key insight of this model is that it features a significant number of what we call “wealthy hand-to-mouth” households. These are households who hold sizeable amounts of illiquid wealth, yet optimally choose to consume all of their disposable income during a pay-period. A natural question is: why would such households optimally choose to consume, in a given period, all of their randomly fluctuating earnings instead of smoothing shocks across peri-

⁴Johnson et al. (2006) conclude their empirical analysis of the 2001 tax rebates with: “*without knowing the full structural model underlying these results, we cannot conclude that future tax rebates will necessarily have the same effect.*” (page 1607). Shapiro and Slemrod (2003) conclude theirs with “*key parameters such as the propensity to consume are contingent on aggregate conditions in ways that are difficult to anticipate.*” (page 394)

⁵In the data, the largest illiquid asset is housing. Therefore, we allow for a service-flow from the illiquid asset to accrue to households. Such service flow is an important component of the return from holding illiquid wealth.

ods? The answer is that they are better off taking the welfare loss from income fluctuation rather than smoothing consumption because the latter option entails either (i) paying the transaction cost more often (in order to withdraw cash when needed to smooth shocks), or (ii) holding large balances of cash and foregoing the high return on the illiquid asset. This explanation is reminiscent of calculations by Cochrane (1989), and more recently by Browning and Crossley (2001), who show that in some contexts the utility loss from setting consumption equal to income, instead of fully optimizing, is second order.

Examining asset portfolio and income data from the 2001 U.S. *Survey and Consumer Finances* through the lens of our two-asset model reveals that around 1/3 of US households fit this profile.⁶ Note that such households would not appear as “hand-to-mouth” from the viewpoint of the standard one-asset model since their net worth is positive.

It is because of this large presence of wealthy hand-to-mouth households that our model is able to generate strong average consumption responses to fiscal stimulus payments: such households do not respond to the news of the rebate, and have a high MPC when they receive it. When we replicate, by simulation, the randomized experiment associated with the tax rebate of 2001 within our structural model, we find consumption responses of comparable magnitude to those estimated in the micro data, i.e., around 25%. The presence of wealthy hand-to-mouth households represents the crucial amplification mechanism relative to the one-asset model. In a plausibly calibrated one-asset economy, average consumption responses to the fiscal stimulus payments are only 3% because the fraction of liquidity constrained households in terms of net worth (i.e., households with zero or negative net worth) is very small.

Since Campbell and Mankiw (1989), it has been argued that some aspects of the data are best viewed as generated not by a single forward-looking type of consumer, but rather by the coexistence of two types of consumers: one forward-looking and consuming its permanent income (the saver); the other following the “rule of thumb” of consuming its current income (the spender). Our model can be seen as a microfoundation for this “spender-saver” view since it endogenously generates “wealthy hand-to-mouth” households alongside standard buffer-stock consumers.

A useful lesson we learn from the model is that the size of the aggregate consumption response to fiscal stimulus payments depends crucially on (i) the size of the individual rebates, and

⁶These estimates are in line with recent survey evidence in Lusardi, Schneider and Tufano (2011) on financially fragile households. Their data show that almost half of US households would be probably or certainly unable to “come up with \$2,000 within a month.”

(ii) the state of the macroeconomy.

When the individual tax rebates are large enough to justify paying the transaction cost needed to access the illiquid account, many households choose to do so and save a significant portion of the rebate. For example, model simulations show that for a transaction cost of \$500, the consumption response to a \$500 rebate is 4 times larger than the response to a \$2,000 dollar rebate. This finding is consistent with Hsieh (2003) who exploits *Consumer Expenditure Survey* data to document that the same consumers who “overreact” to small income tax refunds respond very weakly to annual disbursements from the Alaskan Permanent Fund. These payments are, on average, much larger (around \$2,000 per household).

Similarly, consider of an economy experiencing a recession. If the recession is expected to be severe, many households upon entering the downturn tap into their illiquid wealth to withdraw a buffer-stock of liquid saving that allows them to sustain consumption in case they are hit by a sudden reduction in earnings. Under this scenario, a fiscal stimulus payment to households will not have a large consumption response because many households have already adjusted and have a sizeable precautionary stock of liquid wealth available. Instead, if the recession is mild and only few households (e.g., only those most subject to the unemployment risk) adjust, one should expect a larger aggregate consumption response to fiscal stimulus payments.

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