

A Brief Overview of Recent  
Empirical Evidence on MPCs Out of  
Temporary Changes in Income

## 2008 Tax Rebate

This paper measures the change in household spending directly caused by the receipt of the ESPs by using a natural experiment provided by the structure of the tax cut. The ESPs varied across households in amount, method of disbursement, and timing. Typically, single individuals received \$300–\$600 and couples received \$600–\$1,200; in addition, households received \$300 per child who qualified for the child tax credit. Households received these payments through either paper checks sent by mail or electronic funds transfers (EFTs) into their bank accounts. Most importantly, within each disbursement method, the timing of receipt was determined by the final two digits of the recipient’s Social Security number (SSN), digits that are effectively randomly assigned.<sup>1</sup> We exploit this random variation to estimate the causal effect of the receipt of the payments on household spending, by comparing the spending of households that received payments in a given period to the spending of households that received payments in other periods. We closely follow the

From Parker, Souleles, Johnson, McClelland AER 2013 (ESP is “economic stimulus payment.”)

From Parker, Souleles, Johnson, McClelland AER 2013

We find that on average households spent about 12 to 30 percent of their stimulus payments, depending on the specification, on nondurable consumption goods and services (as defined in the CE survey) during the three-month period in which the payments were received. This response is statistically and economically significant. We also find a significant effect on the purchase of durable goods and related services, primarily the purchase of vehicles, bringing the average response of total CE consumption expenditures to about 50 to 90 percent of the payments during the three-month period of receipt.

For comparison, JPS estimates that in 2001, upon receipt of a tax rebate, household spending on nondurable goods rose on average by 20 to 40 percent of the tax rebate (depending on the specification), a response which is just slightly larger than the response estimated here across similar specifications.<sup>3</sup> However, we find larger total spending in 2008 due to significant spending on durable goods. While some of this difference may be due to sampling error, it may also partly reflect some of the differences in the details of the tax cut and economic environment in 2008 compared to 2001. For instance, some prior research finds that larger payments can skew the composition of spending towards durables, which is consistent with our findings given that the 2008 stimulus payments were on average about twice the size of the 2001 rebates.<sup>4</sup> That said, the overall pattern of results is broadly similar for 2001 and 2008, and so our findings suggest some robustness in the response of consumers to the broad-based tax rebates employed in these two most recent and important recessions.



# From Parker, Souleles, Johnson, McClelland AER 2013

## **II. The Consumer Expenditure Survey**

The CE interview survey contains detailed measures of the expenditures of a stratified random sample of US households. Households are interviewed four times, at three-month intervals, about their spending over the previous three months. Because new households are added to the survey every month, the data can be used to identify spending effects from ESPs disbursed in different months.

Questions about the 2008 ESPs were added to the CE survey in interviews conducted between June 2008 and March 2009, which covers the crucial time during which the payments were disbursed.<sup>13</sup> The questions were phrased to be consistent with the style of other CE questions and the 2001 tax rebate questions. Households were asked whether they received any “economic stimulus payments...also called a tax rebate” since the beginning of the reference period for the interview and, if so, the amount of each payment and the date it was received. Unlike 2001, for each payment households were also asked whether it was received by check or direct deposit. The Appendix contains the language of the CE survey instruments.

# From Parker, Souleles, Johnson, McClelland AER 2013

## III. Empirical Methodology

Consistent with specifications in the previous literature (e.g., Zeldes 1989; Lusardi 1996; Parker 1999; Souleles 1999; and JPS), our main estimating equation is

$$(1) \quad C_{i,t+1} - C_{i,t} = \sum_s \beta_{0s} \times month_{s,i} + \beta_1' \mathbf{X}_{i,t} + \beta_2 ESP_{i,t+1} + u_{i,t+1},$$

where  $i$  indexes households, and  $t$  indexes time,  $C$  is either household consumption expenditures or their log;  $month$  represents a complete set of indicator variables for every period in the sample, used to absorb the seasonal variation in consumption expenditures as well as the average of all other concurrent aggregate factors; and  $\mathbf{X}$  represents control variables (age and changes in family size) included to absorb some of the preference-driven differences in the growth rate of consumption expenditures across households.  $ESP_{i,t+1}$  represents our key stimulus payment variable, which takes one of three forms: (i) the total dollar amount of payments received by household  $i$  in period  $t + 1$  ( $ESP_{i,t+1}$ ); (ii) a dummy variable indicating whether any payment was received in  $t + 1$  ( $I(ESP_{i,t+1} > 0)$ ); and (iii) a distributed lag of  $ESP$  or  $I(ESP > 0)$ , used to measure the longer-run effects of the payments. The key coefficient  $\beta_2$  measures the average response of household expenditure to the arrival of a stimulus payment.<sup>16</sup> To analyze heterogeneity in the response to the payments, we interact  $ESP_{i,t+1}$  with indicators for different types of households. We correct the standard errors to allow for arbitrary heteroskedasticity and within-household serial correlation.

# From Parker, Souleles, Johnson, McClelland AER 2013

TABLE 2—THE CONTEMPORANEOUS RESPONSE OF EXPENDITURES TO ESP RECEIPT AMONG ALL HOUSEHOLDS

	Food OLS	Strictly nondurables OLS	Nondurable spending OLS	All CE goods and services OLS	Food OLS	Strictly nondurables OLS	Nondurable spending OLS	All CE goods and services OLS
<i>Panel A. Dollar change in spending</i>								
<i>ESP</i>	0.016 (0.027)	0.079 (0.046)	0.121 (0.055)	0.516 (0.179)				
<i>I(ESP)</i>					10.9 (31.7)	74.8 (56.6)	121.5 (67.2)	494.5 (207.2)
	Food OLS	Strictly nondurables OLS	Nondurable spending OLS	All CE goods and services OLS	Food 2SLS	Strictly nondurables 2SLS	Nondurable spending 2SLS	All CE goods and services 2SLS
<i>Panel B. Percent change in spending</i>					<i>Panel C. Dollar change in spending</i>			
<i>ESP</i>					0.012 (0.033)	0.079 (0.060)	0.128 (0.071)	0.523 (0.219)
<i>I(ESP)</i>	0.69 (1.27)	1.74 (0.96)	2.09 (0.94)	3.24 (1.17)				

*Notes:* All regressions also include a full set of month dummies, age, change in the number of adults, and change in the number of children following equation (1). Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. The coefficients in panel B are multiplied by 100 so as to report a percent change. The last four columns report results from 2SLS regressions where the indicator variable for ESP receipt and the other regressors are used as instruments for the amount of the ESP. All regressions use 17,478 observations except for the first two columns of panel B which have only 17,427 and 17,475, respectively.



TABLE 5—THE LONGER-RUN RESPONSE OF EXPENDITURES TO ESP RECEIPT

	Dollar change in		Percent change in		Dollar change in	
	Nondurable spending OLS	All CE goods and services OLS	Nondurable spending OLS	All CE goods and services OLS	Nondurable spending 2SLS	All CE goods and services 2SLS
$ESP_{t+1}$ or $I(ESP_{t+1})$	0.201 (0.067)	0.517 (0.211)	3.92 (1.55)	4.96 (1.96)	0.254 (0.110)	0.757 (0.360)
$ESP_t$ or $I(ESP_t)$	-0.054 (0.080)	-0.288 (0.214)	-1.23 (1.50)	-2.22 (1.92)	-0.097 (0.113)	-0.278 (0.330)
Implied spending effect in second three-month period	0.146 (0.104)	0.230 (0.303)	NA	NA	0.156 (0.177)	0.479 (0.568)
Implied cumulative fraction of rebate spent over both three-month periods	0.347 (0.155)	0.747 (0.477)	NA	NA	0.410 (0.273)	1.235 (0.892)

*Notes:* All regressions also include the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. The sample includes only households receiving only on-time ESPs. Standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. The coefficients in the second triplet of columns are multiplied by 100 so as to report a percent change. The final triplet of columns reports results from 2SLS regressions where  $I(ESP)$  and the other regressors are used as instruments for  $ESP$ . The number of observations for all regressions is 10,488.

**TABLE 7—THE PROPENSITY TO SPEND ON SUBCATEGORIES OF EXPENDITURES**

Dependent variable:	<i>Panel A. Food</i>			<i>Panel B. Additional categories in strictly nondurables</i>			
	Food at home	Food away from home	Alcoholic beverages	Utilities, household operations	Personal care and misc.	Gas, motor fuel, public transportation	Tobacco products
Coefficient on ESP	0.050	0.025	0.011	0.059	0.083	0.027	0.007
Standard error	(0.032)	(0.033)	(0.007)	(0.027)	(0.049)	(0.039)	(0.009)
Implied share of increase in nondurable spending	0.16	0.08	0.04	0.19	0.27	0.09	0.02
Share of avg. spending on subcategory	0.23	0.11	0.01	0.23	0.04	0.16	0.01
	<i>Panel C. Additional categories in nondurables</i>			<i>Panel D. Additional categories in total CE spending</i>			
Dollar change in spending on:	Apparel	Health	Reading	Housing (incl. furnishings)	Entertainment	Education	Transportation
Coefficient on ESP	0.022	0.025	-0.001	0.099	0.077	-0.100	0.527
Standard error	(0.021)	(0.048)	(0.003)	(0.092)	(0.099)	(0.042)	(0.269)
Implied share of increase in:							
Nondurable spending	0.07	0.08	0.00				
Durable spending				0.16	0.13	-0.17	0.87
Avg. spending on subcategory:							
Share of nondurable	0.06	0.15	0.01				
Share of durable				0.56	0.13	0.04	0.27
	<i>Panel E. Subcategories of transportation</i>						
Dollar change in spending on:	New vehicle purchases	Used vehicle purchases	Other vehicle purchases	Maintenance and repairs	Other, insurance fees, etc.		
Coefficient on ESP	0.357	0.123	0.011	0.009	0.027		
Standard error	(0.204)	(0.149)	(0.054)	(0.028)	(0.024)		
Implied share of increase in durable spending	0.59	0.20	0.02	0.01	0.04		
Share of average durable spending	0.07	0.06	0.01	0.04	0.09		

*Notes:* The first rows of each panel report results from a regression that also includes the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. The sample includes only households receiving only on-time ESPs ( $N = 10,488$  for all regressions). Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. All results are from 2SLS regressions where  $I(ESP)$  and the other regressors are used as instruments for  $ESP$ .



## Summary of Parker et al. evidence on 2008 Tax Rebate

- They interpret their findings as indicating high MPCs out of temporary tax rebates.



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### How individuals respond to a liquidity shock: Evidence from the 2013 government shutdown☆

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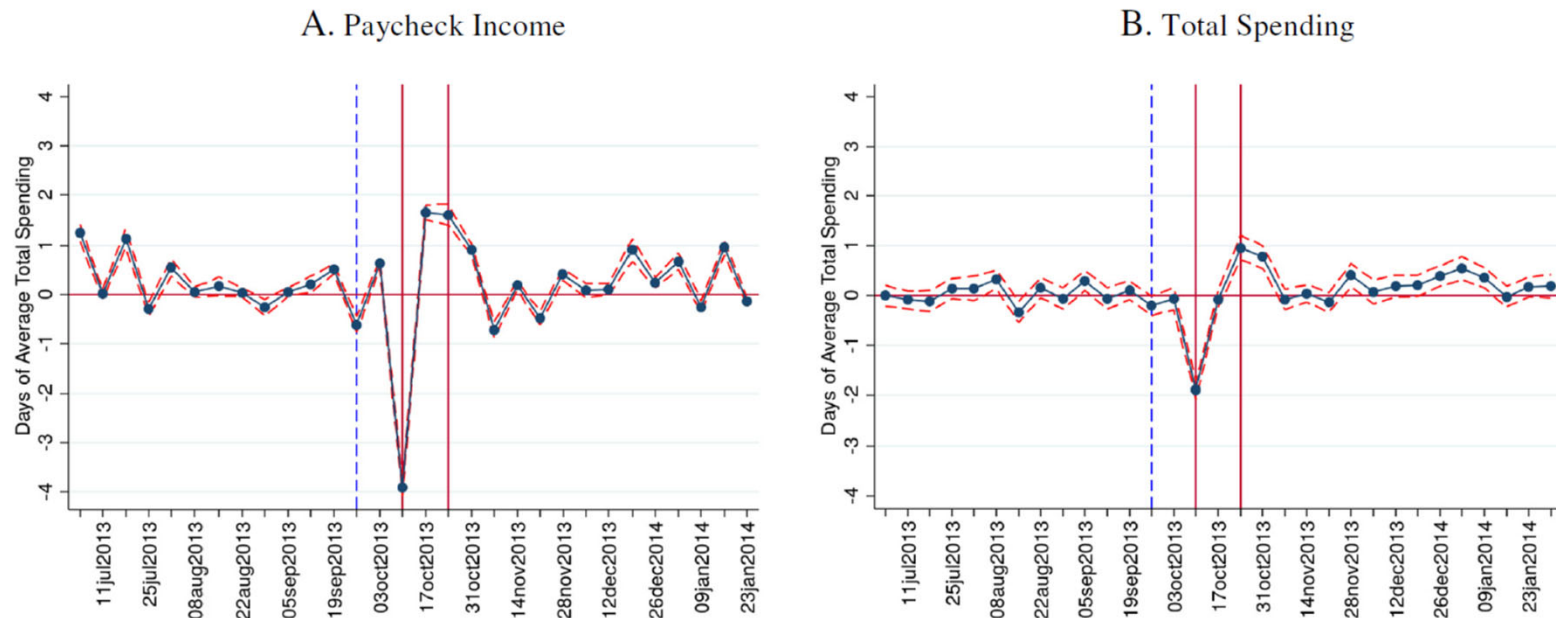
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<sup>f</sup> NBER, United States of America

#### A B S T R A C T

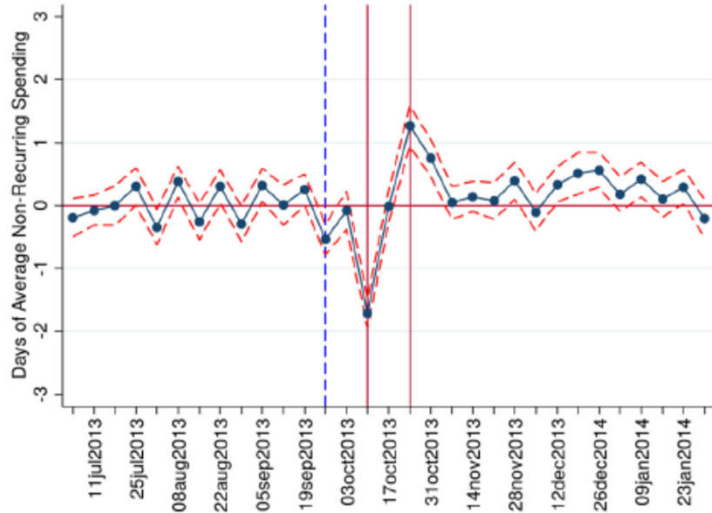
Using comprehensive account records, this paper examines how individuals adjusted spending and saving in response to a temporary drop in liquidity due to the 2013 U.S. government shutdown. The shutdown cut paychecks by 40% for affected employees, which was recovered within 2 weeks. Because the shutdown affected only the timing of payments, it provides a distinctive experiment allowing estimates of the response to a liquidity shock holding income constant. Spending dropped sharply, implying a naïve estimate of 58 cents less spending for every dollar of lost liquidity. This estimate overstates the consumption response. While many individuals had low liquid assets, they used multiple sources of short-term liquidity to smooth consumption. Sources of short-term liquidity include delaying recurring payments such as for mortgages and credit card balances.



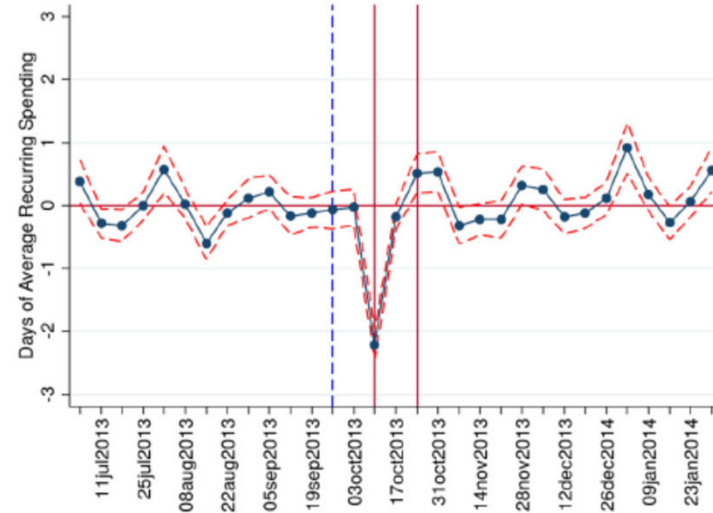
**Fig. 4.** Estimated response of normalized paycheck income and normalized total spending to government shutdown. *Notes:* Difference-in-difference estimates based on Eq. (1). Both paycheck income and total spending are normalized by household-level average daily total spending. The paycheck income plot is estimated using additional controls which include paycheck week and treatment group interactions.  $N = 3804$  and  $N = 94,680$  for treatment and control group respectively. The estimation period is January 17, 2013 to May 22, 2014. The figures, however, display only the period from July 4, 2013 to January 30, 2014.



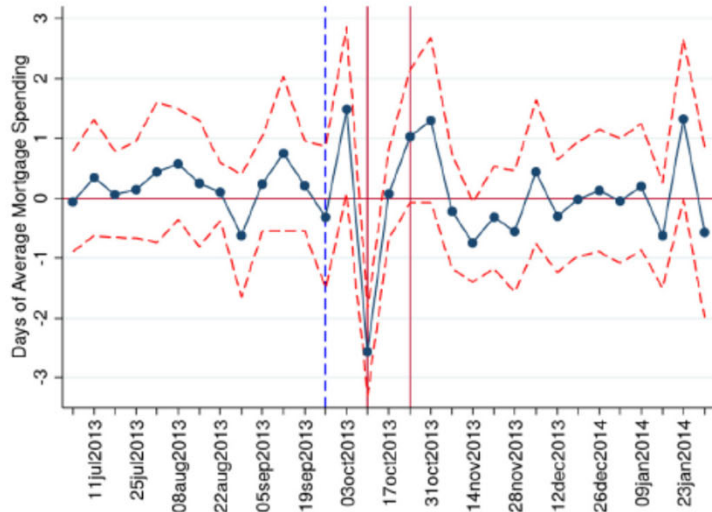
A. Non-Recurring Spending



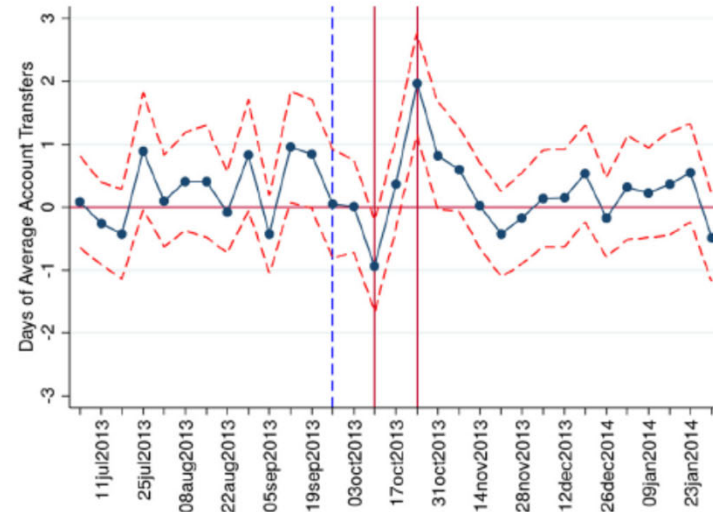
B. Recurring Spending



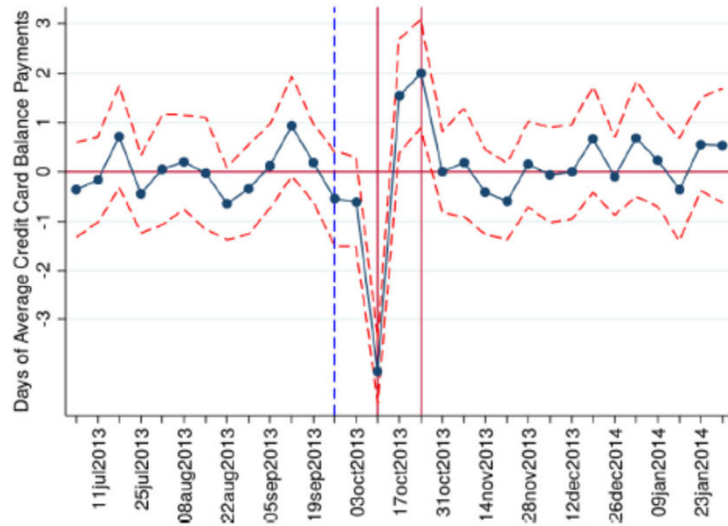
C. Mortgage Spending



D. Account Transfers



E. Credit Card Balance Payments



F. Credit Card Spending

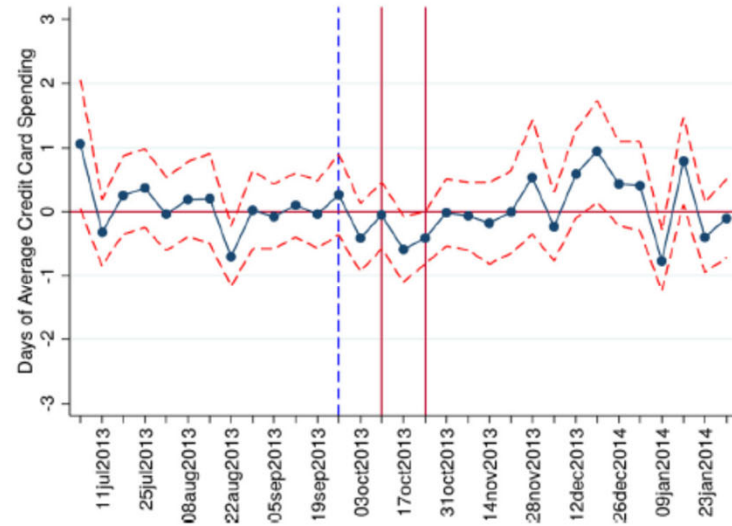


Fig. 5. Estimated response of spending categories to government shutdown. *Notes:* The spending, payment, or transfer category in each panel is normalized by the household-level daily average for that category. N = 3804 and N = 94,680 for treatment and control group respectively.

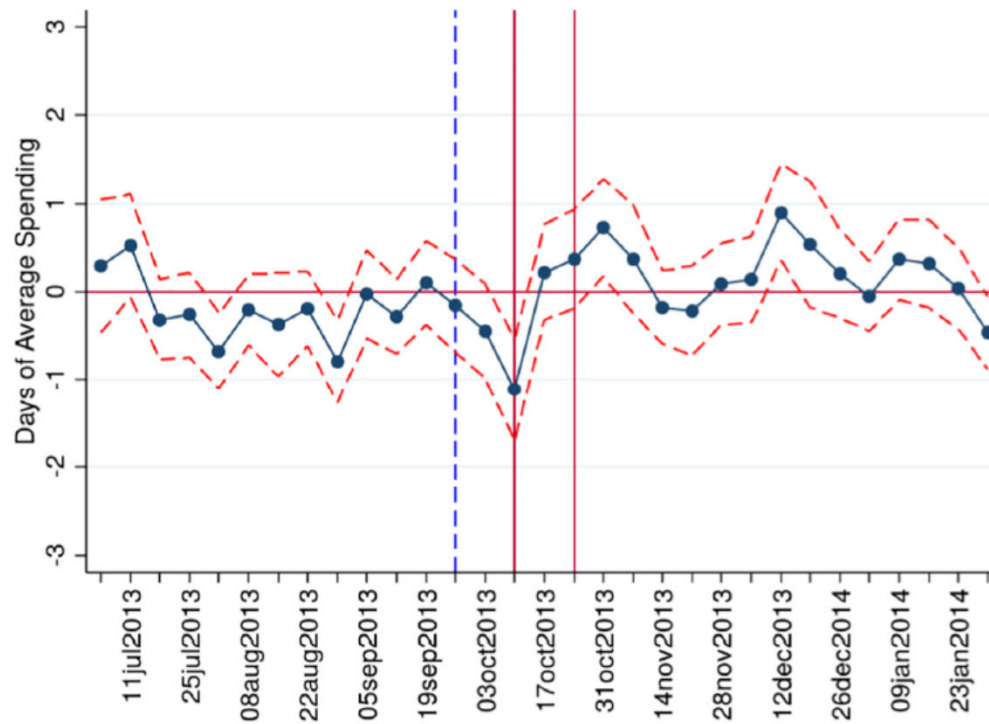


Fig. 7. Estimated response of coffee shop and fast food spending to government shutdown. *Notes:* Normalized by household-level average daily coffee shop and fast food spending, N = 3804 and N = 94,680 for treatment and control group respectively.



## 7. Conclusion

Living paycheck-to-paycheck, which is quite common among U.S. households, leaves these households vulnerable to liquidity and income shocks. The results of this paper reveal how workers use financial assets and debt, sometimes in unconventional ways, to reduce that vulnerability and adjust to shocks when they do occur. The findings indicate that to the extent a large but brief shock to liquidity is an important risk, a lack of liquid assets as a buffer is not necessarily a sign of myopia or unfounded optimism. Rather, the reactions to the 2013 government shutdown studied in this paper indicate that workers can defer debt payments and thus maintain consumption (at low cost) despite limited liquid assets. They may face higher costs to access less liquid assets. Such illiquidity may be optimal even if it leads to short- or medium-run liquidity constraints (see [Kaplan and Violante, 2014](#)). This paper shows that the majority of households have such liquidity constraints as measured by low liquid assets, yet they have mechanisms for coping with transitory shocks to income or liquidity so as to mitigate the consequences of such low liquid assets.

This paper provides direct evidence on the importance of deferring debt payments, especially mortgages, as an instrument for consumption smoothing. Mortgages function for many as a primary line of credit. By deferring a mortgage payment, they can continue to consume housing, while waiting for an income loss to be recovered. For changing the timing of mortgage payments within the month due, there is no cost. As discussed above, that is the pattern for the bulk of deferred mortgage payments. Moreover, the cost of paying one month late can also be low. Many mortgages allow a grace period after the official due date, in which not even late charges are incurred, or charge a fee that is 4–6% of the late payment. Being late by a month adds only modestly to the total mortgage when interest rates are low, and mortgage service companies cannot report a late payment to credit agencies until it is at least 30 days overdue. Even if there are penalties or costs, late payment of a mortgage is a source of credit that is available without the burden of applying for credit.

https://eml.berkeley.edu/cgi-bin/HarnessingDataScience2014.cgi

The screenshot shows a web browser window with the URL <https://eml.berkeley.edu/cgi-bin/HarnessingDataScience2014.cgi>. The page features the EML logo (Econometrics Laboratory, University of California, Berkeley) and a navigation menu with links for Home, About, Services, Accounts, and Help. The main content area is titled "Access to Gelman, Kariv, Shapiro, Silverman, and Tadelis, 'Harnessing Naturally-Occurring Data to Measure the Response of Spending to Income, Science (2014) Public Release Data'". Below the title, there is a section "Why You Must Register" which explains that the data are stored at the University of California, Berkeley's Econometrics Lab (EML) and are password-protected. It states that users must register to gain access and agree to the Conditions of Use. The agreement includes several points: users will not use the materials for commercial purposes, to identify individuals, or to contact individuals; users agree not to download materials where prohibited by law, to use materials in any way prohibited by law, to redistribute the data to third parties, and to secure the data on a password-protected machine to prevent accidental redistribution. The browser's taskbar at the bottom shows the time as 10:54 AM on 5/4/2015.

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**Access to Gelman, Kariv, Shapiro, Silverman, and Tadelis, "Harnessing Naturally-Occurring Data to Measure the Response of Spending to Income, Science (2014) Public Release Data"**

**Why You Must Register**

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# Household Debt and the Dynamic Effects of Income Tax Changes

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Using a new narrative measure of fiscal policy shocks for the U.K., we show that households with mortgage debt exhibit large and significant consumption responses to tax changes. Homeowners without a mortgage, in contrast, do not adjust their expenditure, with responses not statistically different from zero at all horizons. We compare our findings to the predictions of traditional and newer theories of liquidity constraints, providing a novel interpretation for the aggregate effects of tax changes on the macroeconomy.

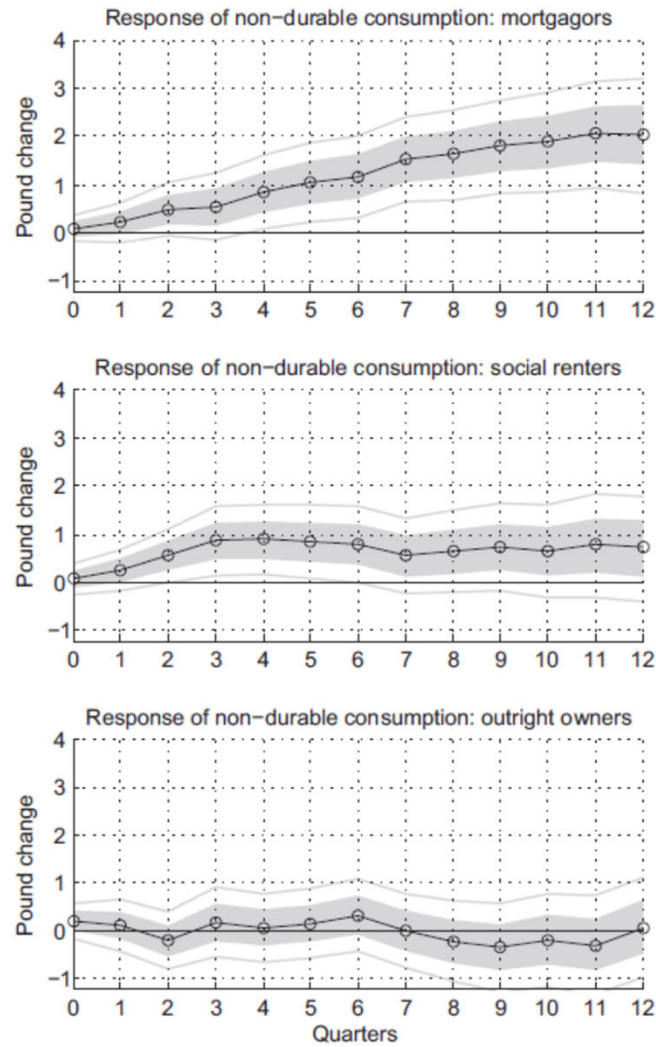


FIGURE 4

Dynamic effects of a per-taxpayer liability change in the allowance and basic rate of income tax on per capita non-durable goods and services consumption across housing tenures using a VAR in non-durable consumption per capita change, real GDP per capita change, real government spending per capita change, and Bank Rate specified as in Section 3. Shaded areas (grey lines) represent 68% (95%) confidence bands over 10,000 bootstrap repetitions. Sample: 1978–2009

# Conclusions

- Kaplan-Violante mechanisms are very promising.
- There is strong evidence that those mechanisms might be important.
- But one must be careful because consumption expenditures are a very noisy proxy for actual consumption.