

ONLINE APPENDIX

Accelerator or Brake? Cash for Clunkers, Household Liquidity, and Aggregate Demand*

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*The content of this appendix does not reflect the views or policies of the U.S. Bureau of Labor Statistics.

Table OA1: Summary Statistics, Stratified by *Clunker* Status

Subsample:	<i>Classified</i>		<i>Unclassified</i>
	<i>Clunker</i>	<i>Close-to-Clunker</i>	
Sample characteristics			
Number of vehicles	1,677	2,264	6,724
Number of households	1,480	2,013	5,377
Sample mean			
Vehicle age (years)	13.1	11.8	7.4
Vehicle value (\$ thousands)	2.1	2.1	9.6
Vehicle fuel economy (MPG)	15.6	21.0	21
Vehicle loan outstanding (indicator)	5.7%	7.2%	33.2%
Vehicle loan balance, if > 0 (\$ thousands)	5.0	4.7	11.8
Household income (\$ thousands)	51.7	50.9	64
Liquid wealth (\$ thousands)	21.9	17.3	28.5
Unsecured loan outstanding (indicator)	41.5%	41.1%	44.8%
Unsecured loan balance, if > 0 (\$ thousands)	9.7	9.1	11.6
Mortgage loan-to-value ratio, if homeowner	36.8%	35.0%	38.4%
Negative home equity (indicator)	8.4%	6.0%	7.8%
Sample median			
Debt-payment-to-income	6.7%	5.0%	10.2%
July – September 2009 Vehicle Purchases			
Mean purchase price (\$ thousands)	24.7	26.8	28.0
conditional on trade-in	23.8	25.7	27.7
conditional on \$3,500 or \$4,500 trade-in	21.8	13.5	20.0

Notes: This table reports descriptive statistics for the Consumer Expenditure Survey (CE). The main regression sample includes *Clunker* and *Close-to-Clunker* vehicles with estimated trade-in value of \$5,000 or less that were owned as of June 2009. A *Clunker* is a vehicle purchased prior to July 2008 for which at least 75% of 2009 registrations in the same make-model-year had fuel economy between 12 MPG and 18 MPG. A *Close-to-Clunker* is a vehicle purchased before July 2008 for which at least 75% of registrations are between 19 MPG and 25 MPG or a vehicle purchased after July 2008 for which 75% of registrations are between 12 MPG and 18 MPG. Unclassified vehicles are those with either fuel economy above 25 MPG or purchase date between July 2008 and June 2009, those for which more than 25% of the vehicles are eligible but at least 25% ineligible based on fuel economy, those with average trade-in value above \$5,000, and those with insufficient CE data reported to classify.

Table OA2: The Cumulative Impact of CARS on the Likelihood of New Vehicle Purchases and Leases through April 2010

Panel A: Cumulative Program Impact - No Controls											
Dependent variable: Number of new vehicles purchased or leased between July 2009 and month:											
	Jul 2009	Aug 2009	Sep 2009	Oct 2009	Nov 2009	Dec 2009	Jan 2010	Feb 2010	Mar 2010	Apr 2010	
Clunker	0.36 (0.20)	1.22 (0.36)	1.43 (0.43)	1.50 (0.51)	1.58 (0.60)	1.48 (0.64)	1.03 (0.68)	0.37 (0.74)	0.09 (0.85)	-0.35 (0.95)	
	[-0.03, 0.75]	[0.51, 1.93]	[0.58, 2.28]	[0.49, 2.51]	[0.41, 2.75]	[0.23, 2.73]	[-0.31, 2.37]	[-1.09, 1.82]	[-1.57, 1.75]	[-2.22, 1.52]	
Obs	3,941	3,548	3,162	2,737	2,401	2,072	1,720	1,371	1,061	749	
R ²	0.001	0.004	0.004	0.003	0.003	0.003	0.001	0.000	0.000	0.000	
Panel B: Cumulative Program Impact - All Controls except MPG											
Clunker	0.37 (0.20)	1.29 (0.37)	1.56 (0.45)	1.67 (0.53)	1.65 (0.61)	1.52 (0.65)	1.07 (0.71)	0.34 (0.76)	0.10 (0.86)	-0.29 (0.96)	
	[-0.01, 0.75]	[0.57, 2.01]	[0.68, 2.44]	[0.64, 2.70]	[0.45, 2.85]	[0.25, 2.79]	[-0.31, 2.45]	[-1.15, 1.83]	[-1.58, 1.78]	[-2.16, 1.59]	
Obs	3,941	3,548	3,162	2,737	2,401	2,072	1,720	1,371	1,061	749	
R ²	0.007	0.008	0.011	0.010	0.010	0.009	0.006	0.005	0.005	0.004	
Panel C: Cumulative Program Impact - All Controls											
Clunker	0.54 (0.32)	1.43 (0.52)	1.72 (0.63)	2.03 (0.74)	2.48 (0.87)	2.57 (0.96)	1.85 (0.97)	0.84 (1.06)	0.73 (1.20)	0.14 (1.55)	
	[-0.09, 1.17]	[0.40, 2.46]	[0.48, 2.96]	[0.58, 3.48]	[0.78, 4.18]	[0.69, 4.45]	[-0.05, 3.75]	[-1.24, 2.91]	[-1.62, 3.09]	[-2.90, 3.18]	
Obs	3,941	3,548	3,162	2,737	2,401	2,072	1,720	1,371	1,061	749	
R ²	0.007	0.008	0.011	0.010	0.011	0.010	0.007	0.005	0.006	0.004	

Notes: This table expands on Table 3 of “Accelerator or Brake? Cash for Clunkers, Household Liquidity, and Aggregate Demand,” reporting cumulative estimates of the impact of the CARS program at each monthly horizon from July 2009 to April 2010. Coefficients are multiplied by 100 to reflect purchase rates in percentage points. The panel headings indicate the control variables, which include vehicle age, trade-in value, and fuel economy, household after-tax income, the number of CE interviews ever completed by the household, and the total number of CE interviews missed to date. Vehicle age is the the number of months since the January of the vehicle model-year. Vehicle trade-in value and fuel economy are averaged across drivetrain configurations of the make, model, and model-year. The standard errors, which are reported in parentheses, and 95% confidence intervals, reported in brackets, are calculated with observations clustered by household.

Table OA3: Measuring the Impact of CARS with Alternative Assumptions

Dependent Variable:	Cumulative purchases or leases of new vehicles					
	Program Anticipation? Purchase in June 2009	Narrow Fuel Economy Range: 16-21 MPG	Wide Trade-in Value Range: < \$6500	Household-level Purchases with Disposal	Purchases with or without Disposal	State Fixed Effects
Clunker (during Jun 2009)	0.21 (0.25)					
<i>Estimated impact</i>						
Clunker (through Jul 2009)		0.73 (0.47)	0.46 (0.29)	0.52 (0.33)	0.54 (0.36)	0.62 (0.35)
Clunker (through Aug 2009)		1.45 (0.77)	1.31 (0.46)	1.35 (0.57)	0.96 (0.57)	1.05 (0.58)
Clunker (through Sep 2009)		1.74 (0.97)	1.61 (0.56)	1.19 (0.69)	1.62 (0.69)	1.80 (0.70)

Notes: This table presents analysis of the CARS program under alternative assumptions. Coefficients are multiplied by 100 to reflect purchase rates in percentage points. The first model examines program anticipation, measuring the difference in the number of purchases or leases in the month before the program (June 2009). The second and third models use different rules for sample construction: a narrow range of fuel economy (16 to 21 MPG) or a wider range of trade-in value (less than \$6,500). The final two models use measures of eligibility and purchases at the household level. In these specifications, *Clunker* is an indicator for whether the household owns any program-eligible vehicle. In the fourth model, the dependent variable is the total number of new vehicle purchases or leases by the household that coincide with disposal of a *Clunker* or *Close-to-Clunker*. In the fifth column, the dependent variable is the total number of new vehicle purchases or leases irrespective of vehicle disposal. The final model includes state fixed effects. Each model includes the full set of control variables: vehicle age, trade-in value and fuel economy (MPG), household after-tax income, the number of CE interviews ever completed by the household, and the total number of CE interviews missed to date. The standard errors, which are reported in parentheses, are calculated with observations clustered by household.

Table OA4: Household Liquidity and CARS Program Response, Controlling for Debt Capacity

Dependent variable:	Number of new vehicles purchased or leased between July and September 2009			
Clunker	2.81 (1.06)	1.50 (0.84)	1.27 (1.37)	2.15 (1.02)
Clunker × Loan on vehicle	-2.93 (1.12)	-2.76 (1.07)	-1.65 (0.77)	-1.64 (0.63)
Clunker × Income bottom tercile ($< \$24,000$)	-0.48 (1.09)			
Clunker × Income middle tercile (omitted) ($\$24,000 - \$57,500$)				
Clunker × Income upper tercile ($> \$57,500$)	-1.00 (1.32)			
Clunker × (PTI already $> 1/3$)		1.87 (1.24)		
Clunker × (PTI $> 1/3$ if $\$0 < \text{pymt} < \500)				
Clunker × (PTI $> 1/3$ if $\text{pymt} > \$500$)		0.79 (0.94)		
Clunker × Mortgage LTV bottom tercile ($\text{LTV} = 0$)			1.00 (1.40)	
Clunker × Mortgage LTV middle tercile (omitted) ($0 < \text{LTV} < 0.5$)				
Clunker × Mortgage LTV upper tercile ($\text{LTV} > 0.5$)			1.25 (1.60)	
Clunker × Negative home equity (indicator)				-0.35 (1.41)
Observations	2,673	2,673	1,983	1,983

Notes: This table repeats the analysis of Table 5 of “Accelerator or Brake? Cash for Clunkers, Household Liquidity, and Aggregate Demand,” but with additional controls for *Clunker* interacted with household debt capacity. Coefficients are multiplied by 100 to reflect purchase rates in percentage points. The standard errors, which are reported in parentheses, are calculated with observations clustered by household.