

Electronic Appendix to
Liquidity Constraint Tightness and Consumer
Responses to Fiscal Stimulus Policy

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1 Loan specific interest rates and loan balances

In section 3 of the paper we note that consumers who are at a kink point have a marginal propensity to spend equal to 1. However, if the propensity to be at a kink point is increasing with the marginal interest rate then the average propensity to spend is positively correlated with the marginal interest rate. In footnote 6 we argue that this could be the case if loan balances get smaller as the marginal interest rate increases. This is verifiable in the data. In Figure EA.1 we present a local polynomial regression of the account specific interest rate on the log of the loan balance in 2008 for all the loans that we observe for the people in our analysis. The graph shows a clear negative association between the marginal interest rate and the loan balance. In Table EA.1, column 1, we have regressed the account specific interest rate on the logarithm of the loan balance using OLS. The negative relationship from Figure EA.1 is confirmed, and the relationship is highly significant. In column 2 we have repeated the regression but now controlling for individual fixed effects. The relationship is almost unchanged and still clearly significant. This shows that even at the individual level the relationship exists.

2 Comparing OLS with Tobit and Probit

The dependent variable in Table 1 in the paper has support in the $[0,1]$ interval. 96% of the observations are extreme outcomes, i.e. either 0 or 1. To make sure that potential misspecification is not driving the results, we have also reproduced the results using probit and tobit estimators. The results are presented in Table EA.2. Columns 1 and 4 reproduce columns 1 and 5 from Table 1 in the paper. Columns 2 and 5 apply a tobit estimator and columns 3 and 6 present results from applying a probit estimator. In the latter case the dependent variable has been assigned to be 0 if it is in the interval $[0,0.5[$ and it is assigned to be 1 if it is in the interval $[0.5,1]$. For the tobit and the probit specifications, we report marginal effects. For the probit specification, we have estimated the model where the dependent variable is a dummy variable, and we have then subsequently multiplied the estimates by 100 to make them comparable to the estimates for the OLS and the tobit

specifications. The results are for all practical purposes unchanged when moving from an OLS specification to a tobit specification or a probit specification.

3 Including Polynomials in the specification

The specification presented in Table 1 in the paper includes linear terms only. Figure 4 suggested that the propensity to spend could be nonlinearly related to the size of the SP-payout. Another concern might be that the realized marginal interest rate is in fact just picking up variations in income across the persons/households in our sample. To address these concerns we repeated the estimations including up to 4th order polynomials in the size of the SP-payout, in all the income variables, and age. The results are presented in Table EA.3. Results are affected only marginally by including the polynomials.

4 Re-estimating on extended sample

In the main analysis presented in the paper, we have included only observations who in the interview indicated that they took out the SP-balance. 173 individuals completed the interview but indicated that they did not take out the SP-payout. We have estimated the same specification as in Table 1 in the paper, but now including the 173 additional respondents in the analysis and coding their spending propensity to be zero. The results from this exercise are reported in Table EA.4, and they are practically identical to the estimates presented in Table 1 in the paper.

5 Survey instruments

The analysis in the paper is based on a survey where we ask people about a range of things in relation to the SP-payout. Below we list all the survey instruments that we have made use of.

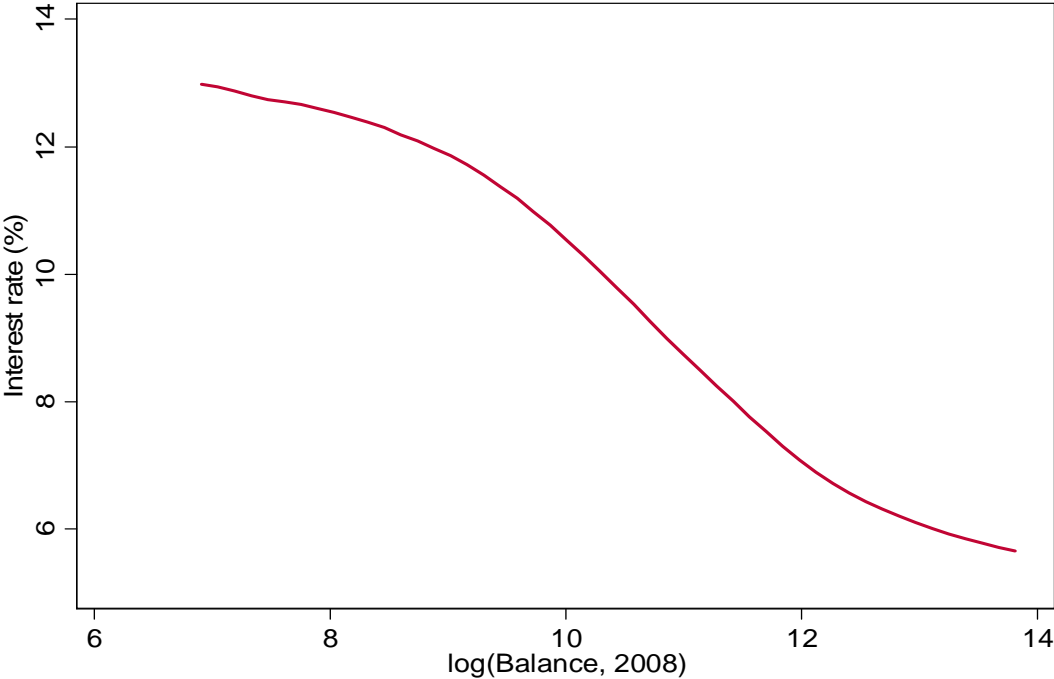
- On March 1st last year, it was decided that the SP-savings (special pension) should be released in relation to the tax reform agreement. Thereby, people with SP-savings

could withdraw these funds in the period from June 1st to December 31st, 2009. Have you used the opportunity to withdraw your SP-savings? 1) Yes 2) No

- How much money did you approximately have on your SP-account (before taxes) when you got the opportunity to withdraw these? 1) Amount (DKK) 2) Don't know (do not read aloud)
- Did you know about the opportunity to withdraw the SP-savings? 1) Yes 2) No
- How much money was approximately paid out from your SP-account after taxes? 1) Amount (DKK) 2) Don't know
- The sum of money that you have at your disposal is the sum of money that you have available for spending, saving, and reducing your debt. The SP payout increased the amount that you have at your disposal in 2009. Considering this increase, how did you allocate it: 1) to increase spending (for example on food, traveling, clothes, televisions, cars, home appliances, computers, restaurants, maintaining the house, or other types of spending); 2) to increase your free savings (i.e. putting money in the bank, buying shares, bonds, or other securities) 3) to reduce your debt; 4) to increase your pension savings
- Concerning the part of the increase [in the sum of money that you have at your disposal] that you allocated for spending, did you mainly spend it on: 1) Large items (for example televisions, cars, white goods, computers, maintaining/improving the house) or unusual items (for example travels, nice clothes, eating at restaurants) 2) Everyday spending (for example food) . 3) Do not know (do not read aloud)
- Did your total income in 2009 evolve differently from what you expected in the beginning of the year? 1) In a much more positive way than expected 2) In a more positive way than expected 3) As expected 4) In a more negative way than expected 5) In a much more negative way than expected 6) Don't know (do not read aloud)

- Have your expectations about your income in 2010 changed since the beginning of 2009? 1) Has changed in a very positive way 2) Has changed in a positive way 3) Unchanged 4) Has changed in a negative way 5) Has changed in a very negative way 6) Don't know (do not read aloud)
- Have your expectations about the possibility for borrowing money in 2010 changed since the the beginning of 2009? 1) I am much more optimistic about the possibility for borrowing money in 2010 2) I am more optimistic about the possibility for borrowing money in 2010 3) My expectations have not changed 4) I am more pessimistic about the possibility for borrowing money in 2010 5) I am much more pessimistic about the possibility for borrowing money in 2010
- Thinking about the consequences of the tax reform for your own financial situation over the next ten years, how do you expect your financial situation to be, compared to 2009? 1) Much better 2) Better 3) Unchanged 4) Worse 5) Much worse 6) Don't know (do not read aloud)

Figure EA.1: Regression of loan specific interest rate on log loan balance by 2008



Notes: The figure draws a local polynomial regression of the account specific interest rate on the log of the corresponding loan balance. Both the interest rate and the loan balance are measured in 2008. The data set includes all loans that we observe for the individuals in our sample. Only individuals. Observations: 11,657.

Table EA.1: OLS and Fixed effect regression of loan specific interest rate on log loan balance by 2008.

VARIABLES	(1) OLS	(2) FE
Ln(Loan Balance, 2008)	-1.5046*** (0.0261)	-1.2352*** (0.0323)
Constant	25.3881*** (0.2907)	22.4198*** (0.3587)
Observations	11,657	11,657
R-squared	0.2224	0.1632
RMSE	4.828	4.523
Number of id		4,171

Notes: The table shows the results from regressing the account specific interest rate on the log of the corresponding loan balance. Both the interest rate and the loan balance are measured in 2008. The data set includes all loans that we observe for the individuals in our sample. Only individuals with multiple loans are included. Robust standard errors reported in parentheses. Level of significance denoted by: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis is based on register data for the people who participate in the survey and it includes information about all loans of the household obtained from the Danish Tax Agency.

Table EA.2: Spending share regressed on covariates, OLS, tobit and probit

	OLS	Tobit	Probit	OLS	Tobit	Probit
Liquidity						
Marginal interest rate, 2008 (%)	0.5388 *** (0.0810)	0.5392 *** (0.0835)	0.5931 *** (0.0850)	0.2961 *** (0.0879)	0.3051 *** (0.0919)	0.3666 *** (0.0934)
Liquid assets / disp income, 2008 (%)				-0.0321 ** (0.0132)	-0.0310 * (0.0129)	-0.0321 * (0.0129)
Debt service / disp income, 2008 (%)				0.1385 * (0.0756)	0.1326 (0.0790)	0.1074 (0.0789)
Size effect						
SP payout / disp income, 2008 (%)				-1.1820 *** (0.2868)	-1.2600 *** (0.2925)	-1.0061 *** (0.2942)
Income controls						
Ln(income), register				-3.1575 (1.9667)	-2.9306 (2.3426)	-3.1873 (2.3520)
Ln(permanent income)				-8.2750 *** (2.5260)	-9.6278 *** (2.8310)	-8.2411 ** (2.8273)
sd[Ln(income)]				0.2424 (1.8546)	1.2717 (2.2484)	-0.1931 (2.1952)
Income developed better, 2009 (d)				2.1155 (2.0215)	2.2776 (2.1064)	2.3733 (2.1297)
Income developed worse, 2009 (d)				-0.5205 (2.0965)	-0.6617 (2.1572)	-0.8932 (2.1671)
Demographic controls						
Age				-0.1742 ** (0.0838)	-0.1577 (0.0879)	-0.1972 * (0.0883)
Woman (d)				2.1612 (1.3784)	1.9362 (1.4265)	2.2751 (1.4403)
Single (d)				0.8002 (1.6981)	0.7926 (1.7478)	1.5991 (1.7639)
Number of children				2.0472 *** (0.6774)	2.1400 ** (0.7223)	1.9288 ** (0.7274)
Education, short (d)				-0.5498 (1.6535)	-0.5459 (1.7388)	-0.3137 (1.7572)
Education, medium (d)				-2.2316 (1.9670)	-2.3261 (2.0669)	-2.1681 (2.0849)
Education, long (d)				-4.4116 * (2.5621)	-4.6675 (2.7093)	-4.6019 (2.7270)
Owner (d)				0.0456 (1.8884)	0.4058 (1.9553)	0.0737 (1.9782)
Expected constraints						
Change E[credit possibility 2010]<0, 2009 (d)				1.0494 (1.9387)	1.3199 (2.0444)	1.1164 (2.0600)
Change E[credit possibility 2010]>0, 2009 (d)				-0.4980 (2.3517)	-0.9283 (2.4590)	0.1371 (2.5104)
Change E[income 2010]>0, 2009 (d)				-1.9482 (1.7125)	-1.9798 (1.7984)	-2.2901 (1.8241)
Change E[income 2010]<0, 2009 (d)				-0.0014 (2.0672)	-0.0358 (2.1120)	-0.0422 (2.1302)
Taxreform => permanent income increase (d)				-0.9581 (1.4280)	-1.0037 (1.4900)	-0.5077 (1.5052)
Taxreform => permanent income decrease (d)				-4.1263 * (2.2021)	-4.1495 (2.2238)	-3.8991 (2.2365)
N	5038	5038	5038	5038	5038	5038

Notes: The table shows the results from regressing the spending share of the SP payout on covariates. Columns 1 and 4 show OLS regression, columns 2 and 5 show tobit regressions and columns 3 and 6 show results from estimation of probit models. Marginal effects are reported for tobit and probit models. Estimates for the probit models are multiplied by 100 to make them comparable to the OLS and tobit estimates. A dummy variable is indicated by (d). Robust standard errors reported in parentheses. Level of significance denoted by: *** p<0.01, ** p<0.05, * p<0.1. The spending share is obtained from survey questions. The marginal interest rate denotes the interest on marginal liquidity and is computed from register data on all loan and deposit accounts of the household obtained from the Danish Tax Agency. Liquid assets, debt service, income variables and all demographic controls are obtained from administrative registers at Statistics Denmark. Permanent income is calculated as the average of incomes over the period 1998-2008. Debt service denotes total interest payments on loans. Liquid assets include deposits, shares and bonds. Short, medium and long education correspond to vocational

Table EA.3: Spending share regressed on covariates (OLS)

	(1)	(2)
Liquidity		
Marginal interest rate, 2008 (%)	0.3036 *** (0.0877)	0.3198 *** (0.0880)
Liquid assets / disp income, 2008 (%)	-0.0328 ** (0.0132)	-0.0390 *** (0.0133)
Debt service / disp income, 2008 (%)	0.1064 (0.0696)	0.0914 (0.0704)
Size effect		
SP payout / disp income, 2008 (%)	-0.0119 *** (0.0029)	-0.0405 (0.0247)
(SP payout / disp income)^2, 2008 (%)		0.0007 (0.0059)
(SP payout / disp income)^3, 2008 (%)		0.0002 (0.0005)
(SP payout / disp income)^4, 2008 (%)		-0.0000 (0.0000)
Income controls		
Ln(income), register	-0.0313 (0.0198)	0.0209 (0.3383)
Ln(income)^2, register		0.0370 (0.0736)
Ln(income)^3, register		-0.0060 (0.0064)
Ln(income)^4, register		0.0002 (0.0002)
Ln(permanent income)	-0.0825 *** (0.0253)	35.5607 (30.0169)
Ln(permanent income)^2		-4.3291 (3.6822)
Ln(permanent income)^3		0.2335 (0.2002)
Ln(permanent income)^4		-0.0047 ** (0.0041)
sd[ln(income)]	0.0019 (0.0185)	-0.0488 (0.0213)
Income developed better, 2009	0.0211 (0.0202)	0.0220 (0.0202)
Income developed worse, 2009	-0.0052 (0.0210)	-0.0060 (0.0210)
Demographic controls		
Age	-0.0018 ** (0.0008)	-0.1553 (0.1382)
Age^2		0.0053 (0.0050)
Age^3		-0.0001 (0.0001)
Age^4		0.0000 (0.0000)
Woman (d)	0.0218 (0.0138)	0.0272 * (0.0140)
Single (d)	0.0081 (0.0170)	0.0099 (0.0171)
Number of children	0.0204 *** (0.0068)	0.0236 *** (0.0076)
Education, short (d)	-0.0055 (0.0165)	0.0017 (0.0166)
Education, medium (d)	-0.0223 (0.0197)	-0.0174 (0.0198)
Education, long (d)	-0.0441 * (0.0256)	-0.0442 * (0.0260)
Owner (d)	0.0035 (0.0187)	0.0078 (0.0188)
Expected constraints		
Change E[credit possibility 2010]<0, 2009 (d)	0.0108 (0.0194)	0.0108 (0.0194)
Change E[credit possibility 2010]>0, 2009 (d)	-0.0051 (0.0235)	-0.0059 (0.0234)
Change E[income 2010]>0, 2009 (d)	-0.0193 (0.0171)	-0.0215 (0.0171)
Change E[income 2010]<0, 2009 (d)	-0.0000 (0.0207)	-0.0003 (0.0207)
Taxreform => permanent income increase (d)	-0.0095 (0.0143)	-0.0100 (0.0143)
Taxreform => permanent income decrease (d)	-0.0412 * (0.0220)	-0.0380 * (0.0220)
Constant	2.1796 *** (0.2089)	-106.4984 (91.6695)
Observations	5,038	5,038
R-squared	0.0502	0.0569
RMSE	0.456	0.455

Notes: Same as notes to Table 1.

Table EA.4: Spending share regressed on covariates, extended sample (OLS)

	(1)	(2)	(3)	(4)	(5)
Liquidity					
Marginal interest rate, 2008 (%)	0.5117 *** (0.0810)	0.3350 *** (0.0875)	0.2985 *** (0.0872)	0.2834 *** (0.0883)	0.2828 *** (0.0883)
Liquid assets /disp income, 2008 (%)		-0.0590 *** (0.0125)	-0.0441 *** (0.0127)	-0.0286 ** (0.0131)	-0.0289 ** (0.0131)
Debt service / disp income, 2008 (%)		0.1090 * (0.0607)	0.1777 *** (0.0618)	0.1159 * (0.0694)	0.1191 * (0.0696)
Size effect					
SP payout / disp income, 2008 (%)			-0.5339 (0.4247)	-0.3115 (0.4292)	-0.3166 (0.4302)
Income controls					
Ln(income), register			0.9422 (1.9578)	-0.1006 (1.9785)	-0.0618 (1.9905)
Ln(permanent income)			-12.6748 *** (2.3403)	-9.4190 *** (2.5956)	-9.5199 *** (2.6099)
sd[ln(income)]			0.5620 (1.8361)	-0.0525 (1.9462)	-0.0453 (1.9495)
Income developed better, 2009			1.4604 (1.9897)	0.6571 (1.9845)	1.6440 (2.0399)
Income developed worse, 2009			0.0733 (1.9709)	-0.1128 (1.9894)	-0.0086 (2.0840)
Demographic controls					
Age				-0.2649 *** (0.0820)	-0.2606 *** (0.0841)
Woman (d)				2.7668 ** (1.3825)	2.7549 ** (1.3845)
Single (d)				0.5582 (1.7084)	0.5044 (1.7081)
Number of children				2.3341 *** (0.6816)	2.2891 *** (0.6819)
Education, short (d)				-0.3529 (1.6620)	-0.3115 (1.6620)
Education, medium (d)				-1.2220 (1.9762)	-1.1862 (1.9755)
Education, long (d)				-4.2499 * (2.5568)	-4.3002 * (2.5634)
Owner (d)				0.5857 (1.8865)	0.4040 (1.8895)
Expected constraints					
Change E[credit possibility 2010]<0, 2009 (d)					1.5489 (1.9577)
Change E[credit possibility 2010]>0, 2009 (d)					-0.9055 (2.3680)
Change E[income 2010]>0, 2009 (d)					-2.9948 * (1.7113)
Change E[income 2010]<0, 2009 (d)					-0.1320 (2.0723)
Taxreform => permanent income increase (d)					-0.8777 (1.4318)
Taxreform => permanent income decrease (d)					-3.2097 (2.1949)
Constant	57.7713 *** (1.0686)	60.6893 *** (1.4437)	208.8797 *** (18.5245)	189.5671 *** (21.0019)	191.3722 *** (21.0231)
Observations	5,211	5,211	5,211	5,211	5,211
R-squared	0.0074	0.0127	0.0335	0.0407	0.0420
RMSE	47.17	47.05	46.58	46.45	46.44

Notes: This table includes respondents who answered that they did not take out the SP balance. These are coded as not spending the SP balance. Otherwise the notes from Table 1 apply to this table.