Sala, Hector; Trivín, Pedro

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Hector Sala
Universitat Autònoma de Barcelona and IZA

Pedro Trivin
Università degli studi di Bergamo

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ABSTRACT

Reported MPC in the Presence of Debt*

We use information from the last wave of the Spanish Survey of Households Finance to study the influence of debt on the self-reported Marginal Propensity to Consume (MPC). The MPC is 43 per cent on average, but indebted households have a smaller MPC than non-indebted households. This negative association increases along with the amount of debt. We also find a lower MPC for households that were subject to liquidity constraints in the previous year, and for those whose reference person is self-employed. We observe that the past relationship between income and consumption is also an important determinant of the MPC as households that invest last year's savings, or hold them for the future, have again a lower MPC. These factors are in line with the predictions of precautionary saving models.

Corresponding author:
Hector Sala
Departament d'Economia Aplicada
Universitat Autónoma de Barcelona
08193 Bellaterra
Spain

E-mail: hector.sala@uab.es

1 Introduction

Imagine that in a raffle you win an amount of money equal to your household's monthly income. What percentage would you spend in the following 12 months, rather than saving it or using it to repay debts? This question has been asked for the first time ever to the Spanish households in the last Survey of Households Finance (Encuesta Financiera de las Familias, EFF) corresponding to 2017.

In this paper, we exploit this unique cross-section information for Spain to learn on the influence of heterogeneities on household consumption intentions. We add to the literature by focusing on the influence that the presence of debt, on one side, and recent households' financial events and expectations, on the other, may exert on their marginal propensity to consume (MPC). The goal is to push forward our understanding of the channels through which households' consumption is more likely to react to unexpected income shocks.

The use of survey quantitative questions containing responses to hypothetical income changes has some advantages over other techniques such as quasi-experimental or decomposition analysis. For example, under the assumption that there is no systematic discrepancy between the intention to spend and actual spending, it overcomes the usual econometric identification problems by isolating an exogenous temporary shock to income without the need of distributional assumptions. As it provides a MPC for each household, the use of survey questions also allows for a more detailed analysis of population sub-groups.

The use of surveys to assess the MPC determinants has become increasingly popular in recent years. Jappelli and Pistaferri (2014) find a negative relationship between the MPC and liquid resources for Italian households, supporting models with precautionary savings. Fuster et al. (2021), Bunn et al. (2018) and Christelis et al. (2019), in contrast, focus on the asymmetric responses to positive or negative income shocks using, respectively, US, British and Dutch households survey data. They all find larger MPCs when households face negative shocks. Bunn et al. (2018) and Fuster et al. (2021) further identify a negative relationship between the MPC and households' resources. Finally, Jappelli and Pistaferri (2020) using a panel data of Italian households argue that part of the negative relationship between cash-on-hands and the MPC is due to unobserved households' saving preferences.

Section 2 briefly refers to the data and empirical methodology. Sections 3 and 4 present the results. Section 5 concludes.

2   Data and empirical methodology

Our analysis relies on the EFF, a survey conducted by the Bank of Spain every three years, since 2002, that provides detailed information on households demographic characteristics, income, consumption, assets and liabilities. Our full-sample analysis consists on 6,401 households that report positive total income. The average MPC reported by this sample is 43%, in line with the MPC found in similar surveys.[1]

To better understand the determinants of MPC we use a simple regression analysis controlling for a large set of household characteristics. The dependent variable is the percentage of the unexpected money increase that Spanish households' reported would spend during the following 12 months. As it is standard when dealing with hypothetical questions, the answers are clustered around three categories: 32% of the households report a MPC equal to zero, 21% say they would spend 50% of the extra monthly income, while 25% would use the whole amount. Given that the dependent variable is censored from above and below, we follow Jappelli and Pistaferri (2014) by using a two-limit Tobit estimator.[2]

3   Baseline analysis

Table 1 shows the baseline results of our analysis. All regressions include a set of baseline controls that account for standard socio-demographic characteristics such as age, gender, marital status, family size, number of adults working, educational level, employment status, and main residence ownership. We also control for the risk profile, abnormal current level of income and the ratio of the stock of durable goods over non-durable consumption. This last control assesses for the possibility that households answer the survey having in mind both durable and non-durable goods. The fact that it is not significant in any specification lessens our concerns (see Jappelli and Pistaferri, 2014).

The full-sample analysis is presented in columns 1 to 3. In columns 4 to 6, the full-sample is restricted by excluding households whose reference person has less than a higher secondary education degree. This allows us to check on the possibility that differences in the understanding of the question could be driving our results.[3] We control for households' financial situation as follows. Columns 1 and 4 consider net total wealth quintiles so that the non-linear relationship between wealth and the MPC can be assessed. Columns 2 and 5 add a dummy indicating the presence of debt, while columns 3 and 6 replace this

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[1]Table A1 in the Appendix presents descriptive statistics of the variables used in our analysis.

[2]OLS results are basically the same.

[3]Unfortunately, the EFF does not ask questions related to households' financial literacy.

dummy by debt quintiles. Wealth and debt variables are normalized by total income.[4]

Table 1 gives some interesting results that are stable across specifications. First, in line with standard life-cycle models, younger households have a smaller MPC than older ones. This negative association is stronger in the medium/high education sample, as shown by the 24 percentage points lower MPC for households whose bread winner is in the age group 18-30 (relative to those whose reference person is above 65 years old). Second, there is a positive association between the level of education and MPC. Third, one extra family member reduces the MPC around 4 percentage points. Fourth, self-employed workers present a MPC that is around 9 percentage points lower than the one of dependent employees, probably reflecting the larger income volatility that is likely to affect this specific group.

When we focus on the relationship between households' MPC and wealth, the first striking result is the absence of a significant relationship. This contradicts the negative relationship between wealth and MPC arising from precautionary savings models. This result may be influenced by the Spanish survey's consideration of positive income shocks only (in contrast to the larger negative shock reactions identified in the literature), but could also be related to other factors at work. On this account, there is a remarkable negative effect of households' debt on the MPC, as shown in columns 2-3 and 5-6. It is lower by 12-13 percentage points for indebted households (with respect to non-indebted households) and falls along debt exposure. The fourth quintile shows a much lower MPC than the reference group, which are households in the first two quintiles together because non of them are indebted. This gap, which amounts to 11-13 percentage points, is further increased to 19-21 percentage points when the top quintile is assessed.[5] This result is consistent with Sahm et al. (2010)'s findings for the US using qualitative survey questions. It provides support to the idea that indebted households are likely to assign an important share of unexpected transitory incomes to debt repayments.

Given how relevant debt is in shaping household's consumption decisions, next section further explores the influence of financial events and uncertainties on the MPC.

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[4]Our results are robust to alternative samples and definitions of the wealth and debt variables. More specifically, the results remain unchanged when examining the sample of households between 18 and 65 years old, when using gross instead of net wealth, and when including income quintiles as a separate variable in the regression. Such results are not reported here for reasons of space but are available upon request.

[5]Some authors argue that the relevant measure of wealth is liquid wealth. When we split assets and debt by components (liquid/non-liquid and secured/unsecured, respectively), we observe that both debt components exert a negative effect on the MPC, while there is only weak evidence of a negative relationship between liquid wealth and the MPC.

Table 1: Baseline results

	Full sample			Education>basic		
	[1]	[2]	[3]	[4]	[5]	[6]
Age 18-30	−10.832	−9.288	−9.085	−25.775	−24.352	−23.729
	(9.017)	(8.957)	(8.948)	(9.788)***	(9.750)**	(9.706)**
Age 31-45	−6.752	−2.582	−0.059	−6.939	−3.807	−1.066
	(4.932)	(4.986)	(5.030)	(5.714)	(5.754)	(5.816)
Age 46-65	0.947	3.275	3.648	5.240	6.871	7.210
	(3.929)	(3.940)	(3.934)	(4.609)	(4.612)	(4.603)
Male	−1.597	−1.209	−1.269	−8.423	−8.132	−8.288
	(2.508)	(2.506)	(2.504)	(2.902)***	(2.896)***	(2.896)***
Married	2.834	3.139	3.086	3.405	3.527	3.473
	(2.872)	(2.864)	(2.860)	(3.334)	(3.328)	(3.329)
Family size	−3.583	−3.187	−3.212	−4.829	−4.449	−4.386
	(1.282)***	(1.281)**	(1.278)**	(1.477)***	(1.474)***	(1.479)***
# Adults working	−2.339	−1.305	−1.322	−0.789	−0.009	−0.238
	(2.183)	(2.185)	(2.182)	(2.492)	(2.490)	(2.492)
Medium education	8.025	8.486	8.521			
	(3.040)***	(3.037)***	(3.037)***			
High education	13.823	14.242	14.555	6.077	5.992	6.188
	(2.920)***	(2.917)***	(2.914)***	(2.755)**	(2.750)**	(2.745)**
Homeowner	−4.648	−1.377	1.870	−6.953	−4.002	−1.203
	(3.898)	(3.954)	(4.105)	(4.196)*	(4.290)	(4.415)
Risk	−0.116	−0.007	0.274	−0.282	−0.243	−0.071
	(2.751)	(2.747)	(2.751)	(2.897)	(2.892)	(2.896)
Self-employed	−10.405	−9.880	−9.567	−8.657	−8.281	−7.872
	(3.935)***	(3.931)**	(3.933)**	(4.249)**	(4.247)*	(4.251)*
Unemployed	4.100	3.664	3.184	−1.504	−2.204	−3.166
	(5.103)	(5.086)	(5.084)	(6.202)	(6.185)	(6.184)
Retired or inactive	3.848	3.655	2.949	4.518	4.169	3.415
	(4.541)	(4.531)	(4.516)	(5.115)	(5.097)	(5.078)
Current income (normal)	3.641	2.711	2.160	1.314	0.439	−0.034
	(2.625)	(2.619)	(2.619)	(3.118)	(3.117)	(3.119)
Current income (larger)	0.787	−0.075	−0.724	0.608	−0.212	−1.176
	(4.630)	(4.623)	(4.639)	(4.826)	(4.824)	(4.838)
$\frac{Durables}{non-durables}$	−0.044	−0.037	−0.035	−0.038	−0.034	−0.033
	(0.028)	(0.027)	(0.027)	(0.028)	(0.028)	(0.028)
II $\frac{W}{Y}$ quintile	1.308	0.381	−0.805	−4.936	−5.727	−6.671
	(4.869)	(4.899)	(4.955)	(5.124)	(5.127)	(5.103)
III $\frac{W}{Y}$ quintile	4.412	1.829	0.360	−1.786	−4.087	−5.278
	(4.997)	(4.988)	(5.024)	(4.927)	(5.033)	(5.037)
IV $\frac{W}{Y}$ quintile	1.825	−1.820	−3.685	−0.876	−3.973	−5.442
	(4.951)	(5.026)	(5.109)	(5.313)	(5.369)	(5.416)
V $\frac{W}{Y}$ quintile	4.397	0.750	−0.651	0.806	−2.195	−3.021
	(5.224)	(5.293)	(5.354)	(6.256)	(6.391)	(6.370)
Debt		−13.645			−11.739	
		(2.682)***			(2.981)***	
III $\frac{Debt}{Y}$ quintile			0.719			−1.837
			(4.806)			(4.446)
IV $\frac{Debt}{Y}$ quintile			−13.263			−11.149
			(3.303)***			(3.707)***
V $\frac{Debt}{Y}$ quintile			−21.319			−19.572
			(3.582)***			(4.030)***
Constant	42.016	43.829	42.878	61.445	63.777	62.793
	(6.376)***	(6.375)***	(6.366)***	(7.623)***	(7.643)***	(7.608)***
Observations	6401	6401	6401	3848	3848	3848

Notes: The dependent variable is the MPC. Standard errors accounting for multiple imputation and the survey structure of the data in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%.

4 Financial events and consumption behavior

We take as reference the specification giving rise to Table 1's results presented in columns 3 and 6. On this basis, we consider extra controls, one at a time, reflecting household's recent revenue-expenditure balances, constraints and job related uncertainties and expectations. Table's 2 first two columns refer to last years' net balance between households' revenues and expenditures ($C_{t-1} < Y_{t-1}$ account for households that are "savers", while $C_{t-1} > Y_{t-1}$ account for those that are "spenders"); liquidity constraints apply in case of repayment delays over outstanding debt in the previous year; credit constraints apply when a credit request has been rejected or the household has not even dared to request it in the last two years; the type of contract controls for those with permanent contracts (and little uncertainty); labour market expectations refers to the self-reported expectation on the probability of loosing the job within the next 12 months; in turn, savings expectations control for households' beliefs of future higher savings relative to those that believe they will be lower. In addition, we conduct the analysis by considering two extra subsamples for non-indebted and indebted households, to try to learn further on the source of heterogeneities (these are denoted as "No Debt" and "Debt").[6]

"Savers" show a MPC, which is between 6 and 11 percentage points lower in all samples but the "Debt" one. This sample is precisely the only one with a negative impact of "spenders" on the MPC, which amounts to 10 percentage points.[7] Table 3 below provides further detail on these results and their rationale.

Table 2: Financial events and consumption behavior

	$C_{t-1} < Y_{t-1}$	$C_{t-1} > Y_{t-1}$	Liq. const.	Credit const.	Contract	Job-keeping exp.	Savings exp.	Obs.
Full sample	−7.950	−3.695	−12.872	−3.336	1.226	−0.061	−10.344	6401
	(2.451)***	(3.238)	(5.543)**	(3.828)	(4.781)	(0.063)	(3.457)***	
Education > basic	−5.930	−4.966	−26.160	−8.411	5.767	−0.075	−9.153	3488
	(2.751)**	(3.830)	(6.911)***	(5.148)	(5.433)	(0.073)	(3.825)**	
No debt	−11.602	4.272		−0.294	−6.759	−0.010	−5.801	3411
	(3.390)***	(4.710)		(5.375)	(7.865)	(0.094)	(5.273)	
Debt	−3.579	−9.918	−11.699	−5.939	4.366	−0.082	−13.573	2951
	(3.542)	(4.441)**	(5.677)**	(5.452)	(6.141)	(0.083)	(4.685)***	

Notes: The dependent variable is the MPC. Standard errors accounting for the multiple imputation and the survey structure of the data in parenthesis.* significant at 10%; ** significant at 5%; *** significant at 1%.

The MPC also decreases for households reporting repayment problems on outstanding

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[6]Due to the multiple imputation structure of the data, the addition of the "Debt" and "No Debt" households differs from the aggregate number of households. Households that have debt in at least one imputation are excluded from the "No Debt" sample. Analogously, a no debt imputation prevents to be in the "Debt" sample.

[7]These differences are not driven by the distribution of "savers"/"spenders" across the different samples. "Savers" are, respectively, 40% and 34% of the "No Debt" and "Debt" samples, while these percentages are 17% and 25% for the "spenders".

debts, but there is no evidence of heterogeneties regarding credit constraints which, as noted, refer to households' past situation. This is a relevant precision since theoretical models predict a larger MPC in the presence of current credit or liquidity constraints. When it refers to the past, however, this positive association tends to blur due to counterbalancing forces. On the one side, past and current constraints may be correlated and therefore related to a larger MPC; on the other side, past constraints may signal a high probability of facing future constraints, thereby causing a fall in the MPC due to precautionary savings motives (Jappelli and Pistaferri, 2014).

No heterogeneities can be found either regarding the household's bread winner labour market situation. Neither having a permanent contract nor the fear of being fired during next year affect the MPC. However, savings expectations matter. The expectation of larger future savings is systematically associated with a lower MPC of around 10 percentage points with respect to households that expect their saving to be smaller. This result is particularly important for households with outstanding debts and creates an interesting asymmetry. While households with no debt decrease their MPC more intensively when they have saved during the last year, the opposite holds regarding future expectations.

Household heterogeneities are further disaggregated in Table 3 so as to explore in more detail the "savers" and "spenders" behavior. Column 1 in Table 2 is disaggregated in the left-hand-side block of Table 3, while column 2 in Table 2 is disaggregated in the right-hand-side block in Table 3 (note that Table's 3 columns correspond to the samples considered in Table's 2 rows).

Table 3: Saving use and funding source

| | Block A: saving uses | | | | | Block B: funds origins | | | |
	Full sample	Education>basic	No debt	Debt		Full sample	Education>basic	No debt	Debt
Investment	−17.219	−15.297	−26.079	−7.076	Indebtedness	−12.203	−23.982	−11.837	−13.700
	(5.151)***	(5.211)***	(7.162)***	(7.269)		(7.039)*	(8.791)***	(17.477)	(7.550)*
Durables	−0.702	2.788	3.031	−4.670	Savings	−6.827	−6.960	−2.120	−12.062
	(4.402)	(4.682)	(6.216)	(6.320)		(3.961)*	(4.621)	(5.304)	(5.893)**
Future	−17.313	−13.787	−17.877	−16.773	Others	9.116	12.882	26.016	−2.105
	(3.420)***	(3.945)***	(4.394)***	(5.349)***		(5.904)	(7.251)*	(9.005)***	(7.809)
Others	3.120	1.561	−2.477	7.960					
	(3.419)	(3.583)	(5.039)	(4.658)*					
Observations	6401	3848	3411	2951		6401	3848	3411	2951

Notes: The dependent variable is the MPC. Standard errors accounting for the multiple imputation and the survey structure of the data in parenthesis.* significant at 10%; ** significant at 5%; *** significant at 1%.

"Savers" may decide to invest their savings (on housing, art and jewellery, own firms, or financial products), spend them on durable goods, hold their savings for the future (heritage, retirement, emergencies), or make other uses (debt repayments, pending tax and insurance payments, or family-related expenditures, among others). When investing or saving for the future, we identify a very robust association with a lower MPC (with

respect to non-saving households), except in the case of indebted households regarding investment. On the contrary, the use of previous savings on durable goods is consistently irrelevant, as well as other uses (again with the exception of the sample restricted to the indebted households). Overall, "savers" seem to be relatively more provident (caring about the future in the form of investments or holding current savings) with a lower MPC that points to persistent saving behaviors.

In the presence of outstanding debts, other uses are associated to an increase in the MPC. A conjecture on this result is that "savers" use their savings to repay part of their outstanding debts and are, therefore, less constrained to increase their consumption out of an unexpected temporary income shock. This result and conjecture are in line with the negative MPC effect across debt quintiles.

Regarding "spenders", we examine heterogeneities arising from the different fund sources that allowed their expenditure to overcome their income. Relative to "savers" and financially balanced households, "spenders" reduce their MPC when their funding comes from extra indebtedness, especially for educational levels higher than the basic one (for which the fall in the MPC reaches almost 24 percentage points) and when it comes from their savings. It is remarkable that this result is particularly important for "spenders" holding debt, in which case funding their extra spending via increased indebtedness or savings has the same negative effect on the MPC. This is in contrast to the use of other funding sources (help from relatives or friends, selling assets, or delaying payments), which does not seem to affect already indebted households. On the contrary, "spenders" with no debt have an increase in the MPC of 25 percentage points when the funding source is neither indebtedness nor previous savings. Interestingly, indebted "spenders" appear indeed as the most cautious type of profligate families.

5   Conclusions

This study signals the complexity of the precautionary savings motives driving consumption. The standard explanation relying on wealth heterogeneities could not be verified. In contrast, the MPC is brought down by more conjunctural factors such as liquidity constraints or being self-employed (i.e., having lower income stability than households whose reference person is a dependent employee or a retired person). These findings are helpful to understand why consumption tends to react quickly across business cycle. They also endorse tax rebate or subsidy policies targeted to self-employees in difficult times, which have been used gingerly during the Covid-19 pandemic.

We also uncovered a strong influence of households' financial situation on the MPC. On the one side, there is a non-linear negative relationship between households' indebtedness

and MPC. On the other side, households who have recently use their savings for an investment, or have precautionary savings (they hold them for future use), display a much lower MPC than the rest of households. We infer that targeted soft-credit lines and debt-alleviation policies in bad times are likely to help smoothing the business cycle through consumption, when financial constraints become generally binding at the micro level.

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APPENDIX

Table A1: Summary statistics

	N	Mean	sd	min	max
Marginal propensity to consume (MPC)	6401	43.07	39.40	0	100
Monetary variables					
$\frac{W}{Y}$	6401	19.16	121.74	-694.35	8397.5
Debt	6401	0.463	0.499	0	1
$\frac{Debt}{Y}$	6401	1.15	22.51	0	1790.9
Baseline controls					
Age 18-30	6401	0.017	0.131	0	1
Age 31-45	6401	0.172	0.378	0	1
Age 46-65	6401	0.412	0.492	0	1
Male	6401	0.616	0.486	0	1
Married	6401	0.609	0.488	0	1
Family size	6401	2.55	1.26	1	10
# Adults working	6401	0.925	0.920	0	5
Medium education	6401	0.255	0.436	0	1
High education	6401	0.346	0.476	0	1
Homeowner	6401	0.822	0.383	0	1
Risk	6401	0.239	0.427	0	1
Self-employed	6401	0.130	0.337	0	1
Unemployed	6401	0.087	0.281	0	1
Retired or inactive	6401	0.467	0.499	0	1
Current income (normal)	6401	0.575	0.494	0	1
Current income (larger)	6401	0.075	0.264	0	1
$\frac{Durables}{non-durables}$	6401	32.71	54.56	0	1500.5
Extra controls					
Liq. const.	6401	0.069	0.253	0	1
Credit const.	6401	0.142	0.349	0	1
Contract	6401	0.253	0.435	0	1
Job-keeping exp.	6401	7.17	19.75	0	100
Savings exp. (Same)	6401	0.505	0.500	0	1
Savings exp. (Larger)	6401	0.195	0.396	0	1
$C_{t-1} > Y_{t-1}$	6401	0.372	0.483	0	1
Investment	6401	0.056	0.229	0	1
Durables	6401	0.060	0.238	0	1
Future	6401	0.135	0.342	0	1
Others	6401	0.121	0.326	0	1
$C_{t-1} < Y_{t-1}$	6401	0.205	0.404	0	1
Indebtedness	6401	0.038	0.190	0	1
Savings	6401	0.112	0.316	0	1
Others	6401	0.056	0.229	0	1