

Fiscal Policy and MPC Heterogeneity

Evidence from the Household Finance and Consumption Survey in Greece

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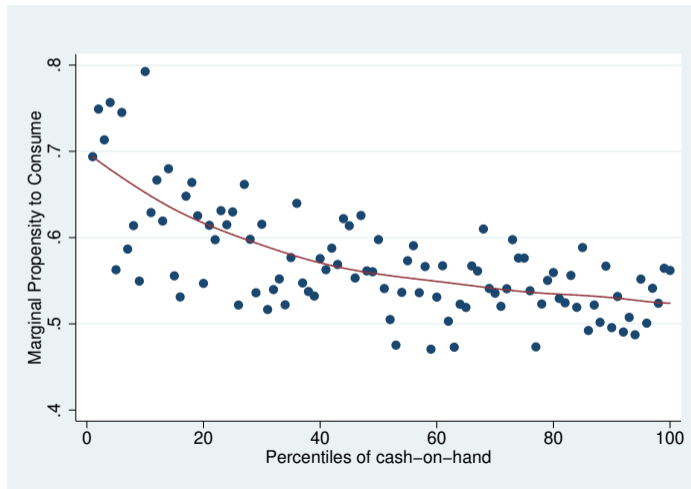
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- Knowledge on how consumers respond to income shocks-the Marginal Propensity to Consume (MPC)- is crucial for evaluating the macroeconomic impact of tax and labor market reforms, and for the design of stabilization and income maintenance policies.
- In previous years large fiscal stimulus packages were enacted by governments on both sides of the Atlantic to counteract the Great Recession. The importance of the consumer response to fiscal policies is attracting renewed attention nowadays given the instruments designed to boost the recovery from the effects of COVID-19 like the Recovery Plan for Europe or the American Rescue Plan, the largest stimulus packages ever.
- One of the major problems for policymakers is to assess the effectiveness of such policies as debt-financed fiscal packages or redistributive programs that maintain the public deficit unchanged.

- The Greek HFCS was conducted in 2018. The net sample size consists of a cross section of 3,007 households and 7,463 members and provides detailed information on demographic variables, income, consumption, wealth (broken down into real assets, financial assets, and various debt components).
- To characterize the MPC, we rely on the following question posed to interviewees: “Imagine you unexpectedly receive money from a lottery, equal to the amount of income your household receives in a month. What percent would you spend over the next 12 months on goods and services, as opposed to any amount you would save for later or use to repay loans?”
- We calculate disposable income for each member by subtracting taxes and social security contributions from each source of income they may have. Then we aggregate income in household level to derive household disposable income. Sources of income include payroll income, pensions, self-employment income, property income, income from financial assets.

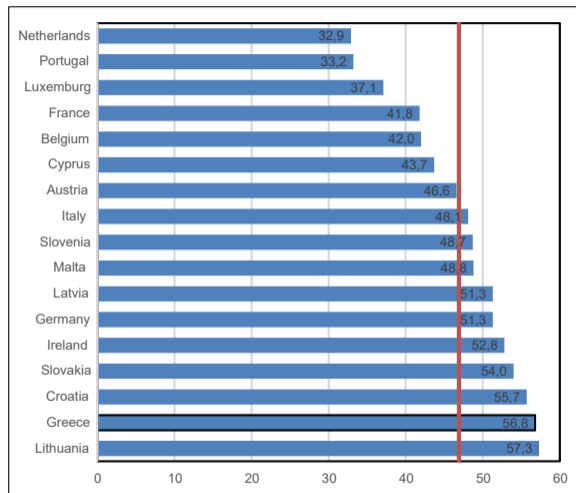
Figure: Average MPC by cash-on-hand percentiles



- The sample mean of the MPC is 57.08 percent (56.8 percent the population mean), the second higher among the 17 countries which participated in the harmonized HFCS and substantially higher than the predictions of standard consumption models on the impact of a transitory shock.
- We explore the relationship between MPC and cash-on-hand, defined as the sum of household disposable income and financial wealth, net of consumer debt. Figure 1 shows that average MPC declines with cash-on-hand, from around 70 percent in the lowest cash-on-hand percentile to some 50 percent for the richest households ¹.

¹For the evaluation of MPC determinants and fiscal policy experiments we follow the methodology of Jappelli and Pistaferri 2014

Descriptive Evidence-Average marginal propensity to consume in %



Source: HFCS 2017, Drescher, Fessler and Lindner (2020)

Regression Evidence

Table: Baseline Estimates

	(1)	(2)	(3)
Age 18-30	0.033 (0.029)	-0.006 (0.029)	-0.010 (0.029)
Age 31-45	0.030 (0.021)	-0.003 (0.022)	-0.006 (0.022)
Age 46-60	0.025 (0.019)	0.005 (0.019)	0.001 (0.020)
Male	0.025 (0.014)*	0.028 (0.014)**	0.028 (0.014)**
Married	-0.035 (0.018)**	-0.032 (0.018)*	-0.028 (0.018)*
Years of Education	-0.007 (0.002)***	-0.003 (0.002)	-0.003 (0.002)
Family Size	0.001 (0.007)	-0.015 (0.008)**	-0.014 (0.008)**
Resident poor areas	0.065 (0.017)***	0.058 (0.017)***	0.059 (0.017)***
Rural area population less than 2.000	-0.100 (0.021)***	-0.093 (0.020)***	-0.092 (0.020)***
Semi-urban area population 2.000-10.000	-0.073 (0.022)***	-0.067 (0.022)***	-0.068 (0.022)***
Urban area population 2.000-10.000	-0.075 (0.019)***	-0.069 (0.018)***	-0.071 (0.018)***
I cash-on-hand quintile		0.159 (0.026)***	0.144 (0.027)***
II cash-on-hand quintile		0.077 (0.025)***	0.070 (0.025)***
III cash-on-hand quintile		0.064 (0.025)***	0.061 (0.025)***
IV cash-on-hand quintile		0.044 (0.023)**	0.044 (0.023)**
Unemployed			0.053 (0.023)**
Observations	2.945	2.945	2.945

- The first specification in column 1 of Table 1 includes only demographic variables: age dummies, gender, marital status, education, family size, dummies for city size, and residence in the poorest areas. Except for age and family size, all coefficients are statistically different from zero. In particular, the MPC is roughly constant throughout the working life. This pattern contrasts with the predictions of standard consumption models that MPC, with respect to transitory shocks, increases with age. One possible explanation is that bequest motives, survival risk or risk of large medical expenses lead elderly households to save a larger fraction of their windfall income than younger households. Both married couples and more educated households display slightly lower MPC. Regional and city size dummies signal that the reported MPC tends to be higher for households in the poor areas and in larger cities.

- In column 2, we add cash-on-hand quintile dummies to the list of regressors. The results confirm a strong negative correlation between MPC and cash-on-hand. The coefficients are precisely estimated and decline monotonically with the quintile dummies. In particular, going from the first to the fifth cash-on-hand quintile is associated with a 20 percentage point decline in the MPC. Interestingly, the strongest decline occurs at low levels of wealth (a 9 percentage point decline between the first and second quintiles). Adding household resources changes the impact of family size and also changes the size and significance of other coefficients. In particular, the male coefficient is increased and married dummy is smaller.
- The third specification, in column 3, adds a dummy for unemployed household heads. While all other coefficients are unaffected, we find that the MPC is 5 percentage points higher for the unemployed, perhaps an indication of binding borrowing constraints or higher incidence of debt.

Bank of Greece got access to the administrative data from the Ministry of Finance. The data come from tax returns that were submitted in 2016 and consist mainly of various definitions for mean and median household income and mean and median taxable value of household property. In order to construct household variables, we need first to create households. The methodology we followed is:

We created a "household id" (HID) that identifies "hosting" tax units together with their "guest" units" (including dependent children and upward relatives). We assign the row number of host family (main taxpayer) to the HID variable in all guest families, dependent children and upward relatives that may file tax separately. For a total number of 6.103.365 tax returns that were submitted in 2016, 4,147,301 households were created. This number is comparable to the 4,162,442 households reported in the European Statistics on Income and Living Conditions (EU-SILC) and the 4,134.540 households in the 2011 Population-Housing census.

Table: Comparison with administrative data

% of households in the most affluent zip codes population	% of households in the most affluent zip codes sample	Disposable Income Tax Returns	Disposable Income HFCS
30%	30.70%	16,120.96	15,864.37
10%	9.58%	18,877.17	18,740.62
5%	4.45%	20,406.09	20,993.34
1%	0.48%	25,984.75	22,938.12
All population (Median)		15,250.80	14,977.67

Table: Effect of Transfer Policy Financed by Debt

Policy: Transfer equivalent to 1 percent of national disposable income	$MPC = C/Y$ (1)	Aggregate consumption growth (2)
Homogeneous MPC		
(a) Transfer to bottom income decile	0.57	0.67%
Heterogeneous MPC		
(b) Transfer to bottom income decile	0.68	0.80%
(c) Transfer to top income decile	0.53	0.62%
(d) Transfer to unemployed	0.61	0.72%

Fiscal Policy with Heterogeneous MPC

How important is MPC heterogeneity for assessing the effect of transitory income changes (such as tax rebates or stimulus packages) on the aggregate economy?

- In the first experiment, we assume that government enacts a transfer policy financed by issuing debt (no taxes are levied). In particular, we study a policy in which government transfers 1 percent of national disposable income equally among all individuals in the bottom 10 percent of the income distribution. This policy is equivalent to a transfer of €1,661, or 120 percent of average monthly income (€1,384).

We next consider two scenarios: in one $MPC = 0.57$ for all individuals (the sample average); and in the other, the MPC is heterogeneous across the sample distribution.

- In the homogeneous case (a), the aggregate MPC is obviously equal to 0.57, and aggregate consumption increases by 0.67 percent.
- If the MPC is heterogeneous, targeting transfers at the bottom 10 percent of the population results in a higher aggregate MPC (0.68) and higher aggregate consumption growth (0.80 percent).

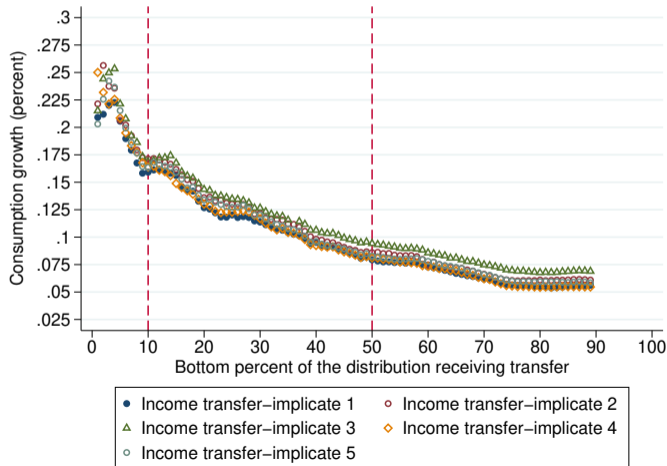
Fiscal Policy with Heterogeneous MPC

- Note that if the government were to implement a pro-rich transfer to the top 10 percent of the income distribution (case (c) in Table), the aggregate MPC and consumption growth would be significantly lower (0.53 and 0.62 percent, respectively).
- Another experiment we consider is to transfer 1 percent of national disposable income equally among all households with at least 1 unemployed member (22.3 percent of the sample), see case (d) in Table. This is equivalent to an unemployment bonus of €742 (about 54 percent of average monthly income), roughly equal to 2 months of the unemployment insurance received by unskilled workers. The quantitative impact of this policy will be to boost aggregate consumption by 0.72 percent, with an estimated aggregate MPC of 0.61. The reason for the similar effect relative to a transfer to the bottom 10 percent of the income distribution is that households with unemployed members are mostly concentrated among the poor.

Fiscal Policy with Heterogeneous MPC

- A different (and perhaps more compelling) type of experiment is a balanced-budget redistributive policy whereby the government finances a transfer to the bottom x percent of the income distribution (where 1×89) by taxing the top 10 percent of the income distribution. In all experiments, as before, tax revenues equal 1 percent of national disposable income. We assume that this amount is obtained by imposing a lump sum equal-sized tax on the top income decile, and that the government transfers this amount equally among targeted households.
- For example, for the first implicate there are 298 households in the top 10 percent of the income distribution. These households pay a tax of €1,639.38 which remains constant during the whole exercise. If the targeted households are the bottom 10 percent of the income distribution, then 292 households receive a net transfer of €1,673.07. If the targeted households are the bottom 20 percent of the income distribution, then 596 households receive a net transfer of €819.69.

Figure: The effect of a redistributive transfer program - Income based transfer



Fiscal Policy with Heterogeneous MPC

- Figure 2 plots the aggregate consumption growth generated by the policy per implicate. Of course, with a homogeneous MPC, a pure redistributive policy has no effect on aggregate consumption.
- However, with a heterogeneous MPC, the effect is positive and highest if the program targets the very poor. For instance, a transfer to the bottom 10 percent of the income distribution would raise aggregate consumption by 0.16 percent.
- A transfer to the bottom 20 percent of the income distribution would raise aggregate consumption by 0.13 percent.
- If the same program targets people with below-median income, the boost in consumption would be around 0.08 percent.

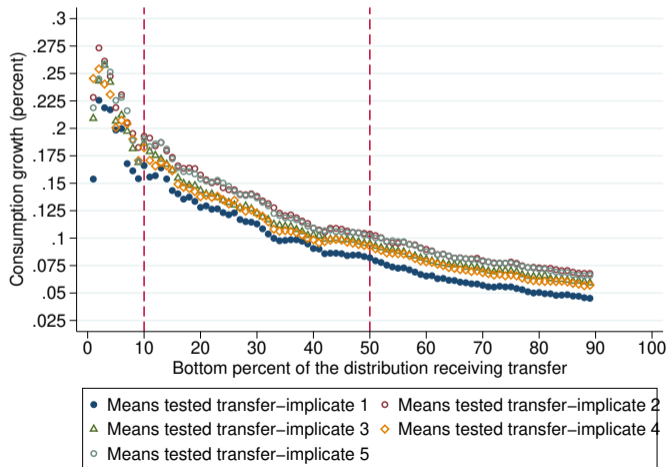
Fiscal Policy with Heterogeneous MPC

- We also consider a case where transfers are “means-tested” rather than being income-based. This case captures an income support program for the lowest x percent of the cash-on-hand distribution. The shape of the curve in Figure 3 is similar to the income-based case, but the overall consumption effect is stronger. The larger effect for programs based on cash-on-hand transfers depends on the stronger negative correlation of MPC with financial assets (which of course are part of cash-on-hand) rather than income.
- The government finances a transfer to the bottom x percent of cash-on-hand distribution (where 1×89) by taxing the top 10 percent of the cash-on-hand distribution. In all experiments, as before, tax revenues equal 1 percent of national disposable income. We assume that this amount is obtained by imposing a lump sum equal-sized tax on the top income decile, and that the government transfers this amount equally among targeted households.

Fiscal Policy with Heterogeneous MPC

- For example, for the first implicate there are 297 households in the top 10 percent of the cash-on-hand distribution. These households pay a tax of €1,644.90 which remains constant during the whole exercise. If the targeted households are the bottom 10 percent of the income distribution, then 292 households receive a net transfer of €1,673.07. If the targeted households are the bottom 20 percent of the income distribution, then 591 households receive a net transfer of €826.63.
- Figure 3 plots the aggregate consumption growth generated by the policy per implicate. Of course, with a homogeneous MPC, a pure redistributive policy has no effect on aggregate consumption. However, with a heterogeneous MPC, the effect is positive and highest if the program targets the very poor. For instance, a transfer to the bottom 10 percent of the cash-on-hand distribution for implicate 1, would raise aggregate consumption by 0.166 percent. A transfer to the bottom 20 percent of the cash-on-hand distribution for implicate 1, would raise aggregate consumption by 0.128 percent. If the same program targets people with below-median income, the boost in consumption would be around 0.082 percent.

Figure: The effect of a redistributive transfer program - Means tested transfer



Fiscal Policy with Heterogeneous MPC

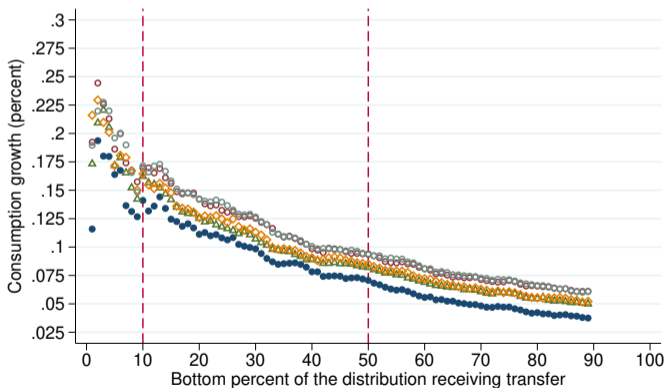
- One might wonder how much of these aggregate consumption effects are due to a correlation between the MPC and the income (or cash-on-hand) distributions as opposed to a correlation with other characteristics that vary across the income distribution, such as age, education, family size, etc. To control for these confounding factors, we expand the baseline regression in column 3 of Table 2, replacing the cash-on-hand quintiles with a set of percentile dummies (D_k). Thus, we run the regression

$$MPC_i = X_i\beta + \sum_{k=1}^{100} \gamma_k D_{ik} + \varepsilon_i \quad (1)$$

- We then use the predicted value $\widehat{MPC}_i = \sum_{k=1}^{100} \hat{\gamma}_k D_{ik}$ to compute the consumption effect of the means-tested program that can be attributed solely to the MPC heterogeneity across the cash-on-hand distribution, controlling for demographic characteristics. The results for all implicates are depicted in Figure 4.

Fiscal Policy with Heterogeneous MPC

Figure: The effect of a redistributive transfer program - Means tested transfer, cond. MPC



- We find that the marginal propensity to consume (MPC) is 56,8 percent, on average, substantially higher than predicted by the standard intertemporal consumption choice model
- This average masks very substantial MPC heterogeneity across households. Indeed, regression analysis uncovers four main facts: (i) a strong negative correlation between MPC and cash-on-hand, (ii) a relatively flat age profile of MPC until retirement (and not statistically different from zero), (iii) a positive correlation with unemployment, and (iv) a negative association between overdraft facility and the MPC.
- The results have important implications for evaluations of fiscal policy, and, in particular, predicting responses to tax reforms and redistributive policies. A debt-financed increase in transfers of 1 percent of national disposable income targeted to the bottom decile of the cash-on-hand distribution would increase aggregate consumption by 0.80 percent.
- Furthermore, redistributing income from the top decile to the bottom decile of the income distribution would boost aggregate consumption by about 0.16 percent.

Appendix: Construction of net disposable household income

1 Payroll income

- a pg0110 Gross cash employee income

2 Pensions and net transfers

- a pg0310 Gross income from public pensions
- b pg0410 Gross income from occupational and private pension plans

3 Other transfers

- a pg0510 Gross income from unemployment benefits
- b hg0110 Gross income from regular social transfers
- c hg0210 Income from regular private transfers
- d hg0260 Financial assistance received from relatives and friends
- e hi0310 amount given as alimony etc per month (-)

4 Self-employment income

- a pg0210 Gross self-employment income
- b hg0510 Gross income from private business other than self-employment
- c hg0610 Gross income from other income sources

5 Property income

- a hg0310 Gross rental income from real estate property
- b hnb0920 Imputed rent

5 Income from financial assets

- a hg0410 gross income from financial investments (dividends, interest on deposits, bonds)
- b di1412 Interest payments (-)
 - a $\sum (hb170_x * hb190_x)$:
HMR mortgage \$x: current amount outstanding *
HMR mortgage \$x: current interest loan of the HMR mortgage
 - b $\sum (hb370_{xy} * hb390_{xy})$:
other property \$x mortgage \$y: current amount outstanding*
other property \$x mortgage \$y: current interest loan
 - c $\sum (hc080_x * hc090_x)$:
non-collateralized loan \$x: outstanding balance of loan *
non-collateralized loan \$x: current interest rate of loan
 - d hc0220 amount: of outstanding credit line/overdraft balance * interest rate
 - e hc0320 amount: of outstanding credit cards balance * interest rate