The marginal propensity to consume out of a tax rebate: the case of Italy

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Fifty Years of The SHIW
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Motivation

- Governments on both sides of the Atlantic have enacted large fiscal stimulus packages to counteract the Great Recession.
- Putting additional cash in the pockets of householders could be an effective way of stimulating expenditures and thus the entire economy.
- However, the effectiveness of these interventions is debated (both empirically and theoretically) and depends on the way Governments have financed the stimulus packages (Ricardian equivalence hypothesis) and consumers have responded to them.

Aim of the paper

We estimate households' consumption responses to the income tax credit recently introduced in Italy

1. using specific questions included in the 2014 wave of the Survey of Household Income and Wealth (SHIW).

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Since the final sample size of the tax credit recipients is quite small, it may be difficult to obtain efficient estimators:

2. we therefore simulate an overlapping generation model in which households consume two goods, non-housing and expensive housing services to support the empirical findings.

Related literature 1

Empirical estimates:

1) Shapiro and Slemrod (2003 and 2009) and Sahm, Shapiro and Slemrod (2010) in analyzing United States' fiscal stimulus packages for 2001 and 2008, respectively; Leigh (2012) for the 2009 Australian fiscal stimulus;
   - we use the panel component of the Survey instead of self-reported answers

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2) Johnson, Parker and Souleles (2006) and Parker, Souleles, Johnson, McClelland (2013) in analyzing United States' fiscal stimulus packages for 2001 and 2008, respectively;
   - we use a difference in difference methodology
   - we look at different aggregated measure of consumption
   - test the liquidity constrain assumption

Related literature 2

More than 60 years after the life-cycle model of Modigliani, we are still looking for the drivers of households MPCs out of an income shock:

3) Kaplan and Violante (2010, 2014); Violante, Kaplan and Weidner (2014); Huntley and Michelangeli (2014); Cerletti and Pijoan-Mas (2012) show how heterogeneous agents models can replicate the nondurable consumption responses upon receiving earnings shocks
   - like in Kaplan and Violante (*Econometrica*, 2014) our empirical analysis is supported by a theoretical model, but we justify the empirical estimates leaving a positive real return on liquid saving.

Preview of the results

- Households receiving the bonus increased their food and durable consumption by less than 20 and 30 euros, respectively (aggregate MPC in the range of 0.5-0.6).
- Responses are larger for households with low liquid wealth (MPC is in between 0.6 and 0.8).
- Theoretically, low-income households, especially when young, compress their non-housing consumption and use most of their liquid saving to achieve their desired level of housing.
- Given the lumpiness in house sizes, the tax credit is too small to allow an increase in housing consumption. Households rebalance their consumption basket by allocating a considerable fraction of their positive earnings shock to the composite non-housing good.

Outline

Introduction

Outline

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Features of the tax credit:

- Starting in May 2014, employees with gross annual income between 8,145 and 26,000 euro began to benefit from the tax credit introduced by Decree Law 66/2014.
- The employer reduces the withholding tax to the employee in order to increase its salary by 80 per month, i.e. (640 euro for 8 months).
- The eligibility condition is defined on individual income.

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SHIW questions on the income tax credit

Did anyone in your household benefit from this bonus in 2014 [BONUS]?

- Yes: How many of you?
- No

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How much did your household receive overall each month [AMOUNT]? How was the bonus used by your household? Giving a value of 100 to the bonus, how was it divided up in percentage terms between [USE]:

- consumption
- savings
- repayment of debt

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In your opinion, for how many more years do you expect the bonus to be paid? [PERMANENT]

- n. of years
- for ever

Distribution of beneficiary households

Characteristics	Beneficiary households	Average monthly amount (euro)
34 and under	37.5	89
35 - 44	37.5	85
45 - 54	30.6	85
55 - 64	25.1	87
over 65	2.4	82
Educational qualification		
none	2.2	69
primary school certificate	4.6	89
lower secondary school certificate	28.1	85
upper secondary school diploma	28.7	87
university degree	20.8	84
Work status		
Employee	42.2	87
Self-employed	10.8	77
Not employed	3.2	81
Number of income recipients		
1	14.8	76
2	28.2	90
3	35.6	89
4 or more	43.7	120
Geographical area		
North	25.4	86
Centre	19	89
South and Islands	18.5	83
Total	**21.9**	**86**

Distribution of tax credit

Percentile of equivalent income	Share of tax credit received	Share of recipient households
1st fifth	9.0	13.3
2nd fifth	20.5	24.2
3rd fifth	25.4	25.6
4th fifth	28.2	28
5th fifth	16.9	16.7

About 21 percent of households reported to have received the bonus, of which almost 90 percent was spent for consumption.

The identification strategy 1

- Given the eligibility conditions for the bonus, ideally, we would use a **regression discontinuity** approach; however, we cannot exactly identify the recipients as households report their net income instead of the annual gross income.
- We have thus resorted to a **difference in difference** approach comparing expenditure for households that received the payment with expenditure for those that did not receive the payments but were otherwise similar in some key respects.

The identification strategy 2

The diff-in-diff approach:

- Of the 1,514 households receiving the bonus, 862 were also surveyed in the previous wave (2012).
- The control group is selected by Propensity Score Matching (PSM); matches are selected by the method of the nearest neighbor, on the common support of fitted probabilities.
- We compare treated (D=1) and non-treated (D=0) households that display strong similarities before the start of the program (in 2012).

We include a set of variables to control for the propensity of receiving the bonus.

balancing

Baseline results

We look at different measures of consumption expenditure as in Jonson et al. (2006) and Parker et al. (2013).

		Dep. Variable			
	Obs.	Food	Cars	Other durables	Implied MPC
Model 1	3,140	14.5	27.2	-0.1	0.48
		21.2	283.2	147.5	
Model 2	3,180	18.0	23.0	12.5	0.62
		20.3	287.6	118.4	
Model 3	3,440	13.6	19.1	12.3	0.52
		19.6	280.2	112.2	
Model 4	2,668	17.9	21.7	16.4	0.65
		21.6	272.8	111.2	

Slightly more than half of the rebate was spent in 2014. The expenditure was higher for transportation compared to the purchase of other durable goods, which, in turn, was lower than the one allocated to food.

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The liquidity constrain assumption

		Dep. Variable			
	Obs.	Food	Transportation	Other durables	Implied MPC
Low cash-on-hand	1,172	34.5	47.6	-14.6	0.79
		31.4	350.9	164.3	
Low cash-on-hand (cars)	1,172	34.5	31.2	-14.6	0.59
		31.4	270.6	164.3	
Condgen=1	480	47.8	19.4	5.4	0.84
		35.0	282.0	104.5	

Liquidity constrained households tend to spend more of their extra income compared to the average population.

Extension and robustness

1. We include the delta in income (after the bonus) as a matching variable $\longrightarrow$ MPCs are in the range of 0.4 and 0.6.
2. Higher MPCs for younger households.
3. Slightly higher MPCs for homeowners
4. For high cash-on-hand households, MPCs are close to 0.5.

delta income

Are these estimates reliables?

- Since the final sample size of the tax credit recipients is quite small, it may be difficult to obtain efficient estimators.
- We therefore simulate an overlapping generation model in which households consume two goods, non-housing and expensive housing services to support the empirical findings.

The Structural Model

The structural model

Model Characteristics

We simulate an overlapping generation model with two consumption goods: a non-housing composite good (C) and housing services (H), that can be rented or bought.

- There is a risk-free liquid asset with positive return (1.5% a year)
- Housing is illiquid (transaction costs), expensive and come in lumpy sizes:
  (1) House sizes come in predetermined and quite large sizes.
  (2) Houses cost twice as much the non-housing good.
- Long-term mortgage contracts: households can finance up to 80 per cent of the value of their house through a long-term mortgage contract. Mortgage debt has to be repaid by retirement.
- Earnings and the bonus:
  (1) There is a deterministic earnings profile (5 different levels).
  (2) Stochastic innovations are very persistent or transitory (up to 5 years).
  (3) The size of the innovations is equal to the Italian tax bonus.

Intuition from the model

The driving force behind our simulated MPCs out of a positive earnings shock is a **rebalancing of households consumption basket away from housing, that is quite expensive and lumpy**

Intuition: expensiveness and rebalancing

The more expensive is the housing good, the higher are simulated MPCs out of the tax credit.

- When housing is expensive and has a minimum size, households consumption basket is skewed towards housing services.
- Given a degree of substitutability between H and C (Cobb-Douglas utility function), households compress C to get as much real H as possible, given that a house can be resold at the same price later on.
- Moreover, households do not need to increase that much their level of liquid saving upon a shock, since housing already represents a considerable store of wealth.

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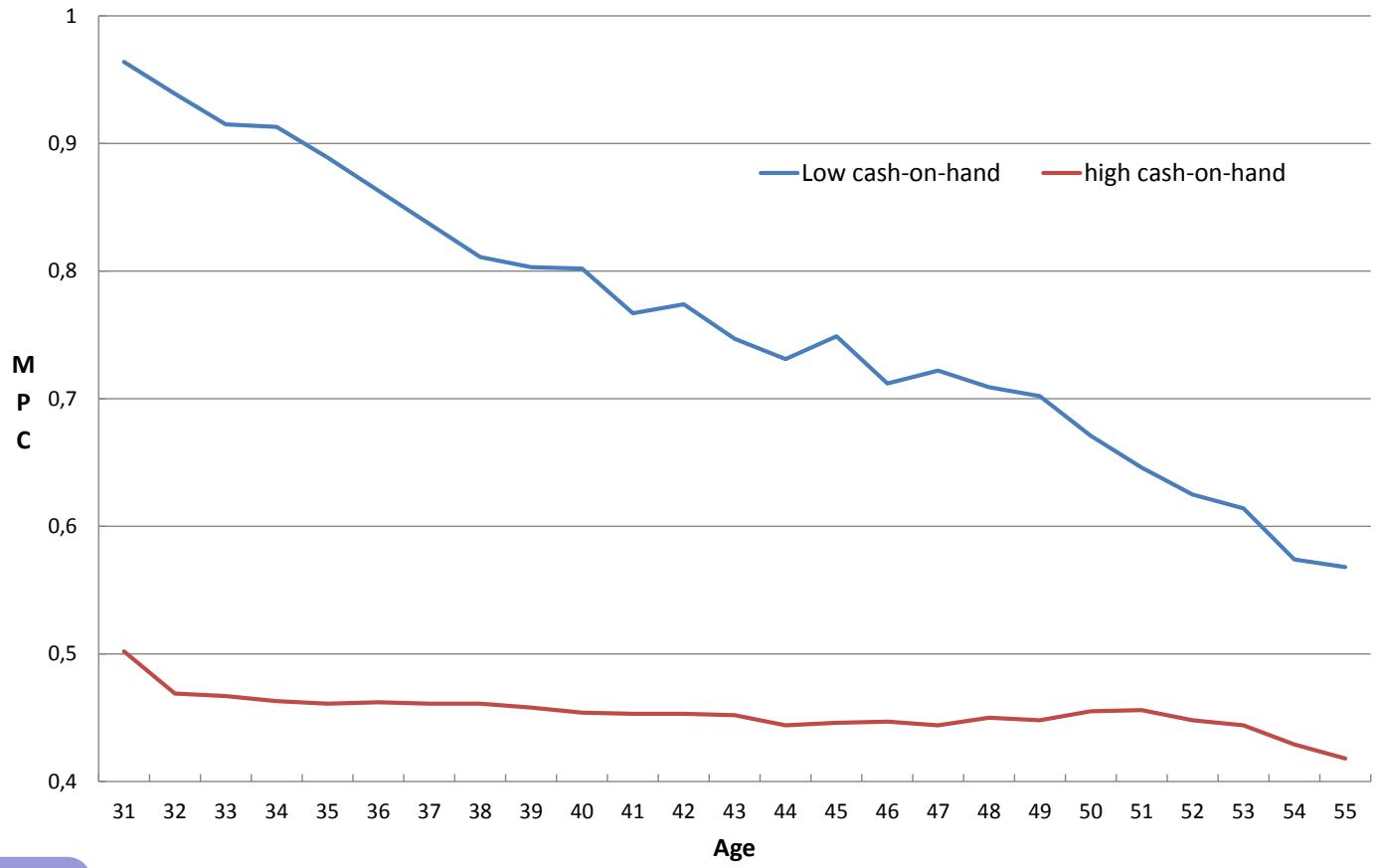
Then, upon receiving a positive shock households rebalance their consumption basket towards C (nondurables + durables), even if the shock is transitory.

Intuition: lumpiness

In order to justify high MPCs out of a shock, households do not have to allocate its majority to housing consumption.

- A persistent life-time shock in the order of 3-4 per cent of earnings is big enough to warrant a change in housing. Unless housing is very lumpy.
- Lumpiness is necessary, since otherwise households could adjust continuously their housing consumption, even by an infinitesimal bit and even if the good is quite expensive.
- Lumpiness is better than imposing super-high transaction costs (like in Kaplan and Violante, 2014), since the latter are a pure dead-weight loss to households, depress the implicit return on housing and force the modeler to impose a negative return on liquid saving to preserve the existence of homeownership in equilibrium.

Results: MPCs by age and liquidity levels



permanent

MPCs by age and liquidity levels

1. We get MPCs that are close to the empirical estimates: around 0.5 on average.
2. Average MPCs are driven by high cash-on-hand households, that account for most of the empirical sample.
3. Low cash-on-hand households have a higher MPC: marginal utility of increasing consumption is higher when liquidity is low.
4. Young households are cash poor $\rightarrow$they have higher MPCs out of the bonus.

Conclusions 1

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Conclusions 2

We therefore also simulate an overlapping generation model in which households consume two goods, non-housing and expensive housing services to support the empirical findings.

- We show that low-income households, especially when young, compress their non-housing consumption and use most of their liquid saving to achieve their desired level of housing.

Conclusions 2

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- Given the lumpiness in house sizes, the tax credit is too small to allow an increase in housing consumption.
- Households have few incentives to increase their liquid saving since housing already guarantees an important storage of wealth.
- As a result, households rebalance their consumption basket by allocating a considerable fraction of their positive earnings shock to the composite non-housing good.

Thanks for your attention!

Balancing properties

	Control		Treated		Mean differences	
	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev
No. of components (equiv.)	1.991	0.575	1.943	0.546	0.048	0.028
Income (bracket)	3.538	1.382	3.497	1.282	0.041	0.067
Geographical area (bracket)	1.924	0.902	1.876	0.883	0.047	0.045
Age (bracket)	3.255	0.999	3.266	0.984	-0.011	0.050
Education (bracket)	3.460	0.946	3.471	0.846	-0.011	0.045
Work status (bracket)	1.638	0.851	1.608	0.886	0.031	0.044
Make ends meet	2.907	1.313	2.890	1.158	0.017	0.062
Δ(No. of employee) 2014-2012	-0.017	0.575	-0.017	0.485	0.000	0.027
Δ(No. of older people) 2014-2012	0.051	0.307	0.028	0.246	0.023	0.014
Sample weight	1.070	1.032	1.025	0.983	0.044	0.051
Quality of income responses	8.332	1.524	8.330	1.535	0.003	0.077

identification

Features of the tax credit:

Starting in May 2014, employees with gross annual income between 8,145 and 26,000 euro began to benefit from the tax credit introduced by Decree Law 66/2014.
The tax credit of 80 euro per month (640 euro for 8 months) was given to 10 million employees with annual salary ranging between 8,145 and 24,000. For earning in between 24,000 and 26,000 euro, the bonus is 80 X (26,000 - income).

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- Those who earn less than 8,145 or more than 26,000 euro and those who are not employed (retired, self-employed, unemployed etc.) are not entitled to the tax credit.
- The eligibility condition is defined on individual income.
- Workers in very similar conditions are being treated differently.

back

MPCs by shock durability: households with high liquidity

back

Household expenditure

Why it is better to look at disaggregated measure of consumption?

- Battistin, Miniaci and Weber (JHR, 2003), *What do we learn from recall consumption data?*
- Experiment in SHIW 2012
- It is in line with the relevant literature, as in Johnson et al. (2006) and Parker et al. (2013)

The goods included in our sample represent about 60% of total consumption according to the National Accounts definitions

back

Further results: delta income (after bonus)

		Dep. Variable			
	Obs.	Food	Cars	Other durables	Implied MPC
Model 1	3,144	21.2	13.6	-0.8	0.40
		20.4	270.2	121.3	
Model 2	3,160	14.0	28.8	3.4	0.54
		19.2	262.1	131.7	
Model 3	3,436	19.0	28.6	1.4	0.57
		18.4	253.3	123.0	

back