



How household consumption responds to credit card refunds

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ABSTRACT

With the widespread growth of online commerce, we observe an increasing amount of refunds on purchases. Do these refunds affect consumption differently than regular income such as salaries? This paper uses transaction-level data from a bank to examine the marginal propensity to consume (MPC) of credit card refunds. We find that the MPC of credit card refunds is approximately 0.7 for the following week, while the MPC of salaries is only 0.021. We also find that the MPC increases with the refund size while decreases with salary amount. These findings add novel evidence to the mental accounting theory from refunds on purchases.

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1. Introduction

Online shopping has grown tremendously over past decades and is becoming more popular with the spread of the coronavirus disease worldwide. In European countries, the refund rate of online shopping (25%–40%) is higher than that of offline shopping (8%).² During the Alibaba Double-Eleven shopping festival in China, consumers refunded 6% of purchased goods, totaling 2.4 billion dollars. These refunds have become an increasingly important part of consumers' cash flows. An interesting question is, do refunds on purchases affect consumption differently than regular income?

Using a transactional dataset from a large bank, we analyze this question for the first time in the literature. We find that the marginal propensity to consume (MPC) out of credit card refunds is approximately 0.7 in the week following the refund, even after excluding spending in the same refund category. This value is strikingly large and much higher than the 0.021 estimate for the MPC out of salary payments. The MPC increases with the size of refunds but decreases with the salary amount. These results suggest that refunds on purchases and salaries are non-fungible and that mental accounting theory may explain our findings.

Our study is related to the literature on the estimation of MPC and mental accounting. Although the life-cycle hypothesis suggests that consumers smooth consumption throughout a lifetime, empirical studies estimating the MPC of income (such as tax rebates or regular income) have not reached an agreement. Carroll et al. (2014) calculate the MPC of regular income in 15 European countries, and their estimates of the MPC range between 0.1 and 0.2. Meanwhile, Hastings and Shapiro (2018) find that the MPC of cash income is insignificant from 0 and that the MPC of tax rebates varies greatly, from 0 to 0.9 (Agarwal et al., 2007; Da et al., 2015).

Thaler (1990) proposes the mental accounting theory to explain the different MPCs of different levels of income. Researchers find that households treat types of income differently—depending on the amount and category (Abeler and Marklein, 2017). Empirical evidence also shows that people treat money differently if it is assigned a unique “name” (Grinblatt and Han, 2005; Hastings and Shapiro, 2018).

Though economists have not proved that credit card refunds are coded as a special category of income, we propose that households will spend these refunds differently from the salaries they receive; that is, they belong to different mental accounts.

2. Empirical analysis

2.1. Data and summary statistics

We use a propriety dataset from a large bank (the “Bank” from here on) from 2013 to 2015. The dataset consists of

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² <https://www.paazl.com/blog/e-commerce-returns-in-europe/>.

Table 1
Summary statistics.

	Count	Mean	SD
Refund (\$)	63,816	223.19	316.53
Consumption (Refund Event) (\$)	63,816	274.61	445.61
Salary (\$)	352,481	2395.55	1613.87
Consumption (Salary Event) (\$)	352,481	162.77	344.22
Wealth (\$1,000)	416,297	16.79	103.46
Age	16,095	41.59	13.63
Female	16,095	54.80%	0.55
Married	16,095	25.77%	0.26
College-educated	16,095	40.60%	0.41

comprehensive transaction records for credit cards, checking, savings accounts, and demographic information on the account holders.

Our analysis focuses on 16,095 consumers with monthly salary direct deposits, at least one credit card refund record, and who use the Bank's card as their primary credit card.³ Our analysis is at the consumer-event level, with the event being either receiving a credit card refund or a salary payment. We study discretionary consumption (excluding non-discretionary expenses such as electricity and water fees) one week following the event as the outcome variable. We make sure that no other events are occurring within seven days following every event. To avoid the possibility that consumers apply for a refund for buying a better item of the same category, hence mechanically generating a high MPC, we further exclude consumption in the refund category.⁴ Because the average time for households to receive the refund is five to seven days according to the Bank, we also exclude the possibility that consumers apply for a refund and receive it for preplanned shopping.

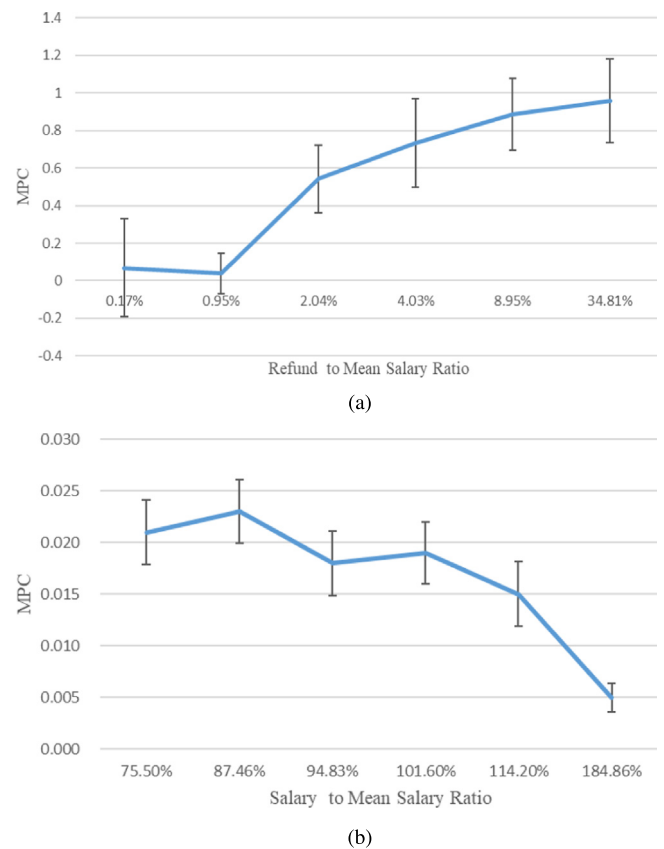
Table 1 reports the summary statistics. We analyze 63,816 credit card refund events and 352,481 salary payment events. The average consumption one week after the refund and salary events are \$274.61 and \$162.77, respectively. The average financial wealth (from savings, stocks, funds, and insurance) is \$16,781. Individuals are, on average, 42 years old, with 54% being female, 26% being married, and 41% being college-educated.

2.2. The empirical results

We separately estimate the MPC of credit card refunds versus salaries using the regression in Eq. (1). The observation level is consumer i during event t . The dependent variable is discretionary consumption for the week after the event. The main independent variable is the amount of purchase refund or salary payment. Control variables include the logarithm of financial wealth, marriage status, age, and education. We also control for year, month, day of the week dummies, and individual fixed effects. Hence, the MPC is identified from within-individual variations across multiple events:

$$\text{con}_{i,t} = \beta_1 \text{event_amt}_{i,t} + \beta_2 Z_{i,t} + \text{time}_t + u_i + \varepsilon_{i,t} \quad (1)$$

Table 2 shows the regression results. Columns (1) and (2) report the MPC of credit card refunds, while Columns (3) and (4) report the MPC of salaries as a comparison. As shown in Column (2), in which we have all our control variables, the MPC of refunds is 0.726, indicating that when consumers receive one extra dollar of refunds, they spend on average \$0.726 outside the

**Fig. 1.** Effects of the payment size on the MPC of credit card refund and salary.

refund category. This is much higher than the MPC of salary estimated in Column (4) – 0.021. Considering our sample individuals are paid monthly, the monthly MPC of salary is approximately 0.09, assuming that these people consume similarly in the next 30 days; and such an estimate is consistent with the literature (Carroll et al., 2014).⁵ We also include consumption in the refund category in a robustness test (Appendix Table A4), and find an increased MPC of refunds, as expected.

Overall, these results suggest that first, credit card refunds and salaries are non-fungible and may belong to two different mental accounts. Second, the MPC in the refund account is higher than that of the salary account.⁶ Two possible explanations for the MPC difference arise from the theory of mental accounting, which suggests that (1) smaller and (2) windfall income has higher MPCs (Thaler, 1990). Credit card refunds are often smaller than salary payments. Moreover, consumers may treat refunds as windfall income or view them as part of the income already “spent”.

The first explanation from mental accounting theory suggests that the MPC will decrease as the size of income increases (Thaler, 1990). We explore how the MPC varies with the size of refunds and salaries by splitting the sample into six groups based on the refund/salary to mean salary ratio and estimating the MPC using interaction terms. The estimated MPCs in Fig. 1a (refunds) and 1b (salary) show an interesting contrast: Consistent with the mental accounting theory, the MPC of salary payments generally decreases with size, while the MPC of refunds steadily increases

³ We exclude any observation with a positive credit balance (2% of our sample) to make sure that our results are not driven by people spending down positive credit balances.

⁴ Appendix Table A1 provides definitions for the consumption categories.

⁵ As additional tests, we also scale consumption by average income or consumption, and we restrict our sample to high-cash-holding consumers (Appendix Tables A2 and A3), and find robust results.

⁶ Appendix Table A5 reports tests that show this difference is statistically significant.

Table 2
MPC of credit card refund and salary.

	Consumption			
	(1)	(2)	(3)	(4)
	Credit card refund		Salary	
Event amount	0.750*** (0.122)	0.727*** (0.138)	0.021*** (0.003)	0.021*** (0.003)
Control (4)	Y	Y	Y	Y
Time (3)		Y		Y
Individual F.E.		Y		Y
Observations	63,816	63,816	352,481	352,481
Adj. R-squared	0.326	0.519	0.016	0.058

Standard errors clustered at the individual level. ** $p < 0.05$, *** $p < 0.01$.**Table 3**
Heterogeneity analysis.

	Consumption		
	(1)	(2)	(3)
Refund	0.624*** (0.204)	0.388*** (0.061)	0.526*** (0.057)
Refund * Female	0.128** (0.056)		
Refund * Below bachelor		0.436*** (0.069)	
Refund * Low wealth			0.232*** (0.046)
Control (4)	Y	Y	Y
Time (3)	Y	Y	Y
Individual F.E.	Y	Y	Y
Observations	63,816	63,816	63,816
Adj. R-squared	0.517	0.518	0.518

Standard errors clustered at the individual level. ** $p < 0.05$, *** $p < 0.01$.

with size. As far as we know, this is the first finding of the MPC increasing with the payment size in the literature. Considering that a refund is generally smaller than a salary payment, the opposite slopes in MPCs could be due to nonmonotonicity across payment sizes, or that larger refunds are more salient for consumption purposes. This result also suggests that the windfall image of refunds would better explain the high MPC we find.

Lastly, we analyze the heterogeneity in the MPC of refunds (Table 3). We look at how the MPC varies with gender, education, and wealth. The MPC of refunds is significantly higher when consumers are female, less educated, and have lower wealth.

As robustness, we estimate Eq. (1) on consumers who only use the Bank's card, to exclude the possibility that households aim for equal balances between different credit card accounts, and find the same results (Appendix Table A6). We also re-estimate Eq. (1) but change the dependent variable to the discretionary consumption between initiating a refund and receiving the refund, and find no evidence of anticipatory consumption cut downs. Thus, our result is not due to households delaying other expenditures that they now "catch up" on when they potentially have already made a repurchase (Appendix Table A7).

3. Conclusion

This paper explores for the first time how refunds on purchases affect consumption compared to salary income. Using transactional data, we find that the MPC of refunds is approximately 0.7, much higher than that of salaries. The MPC increases with the refund size while decreases with the salary amount. These findings suggest that refunds and salaries are non-fungible, consistent with the mental accounting theory. More studies on why refunds are different from regular income for consumption are needed in the future.

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Appendix A. Additional results and robustness checks

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.econlet.2020.109683>.

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