# CONSUMPTION CONTAGION:
## DOES THE CONSUMPTION OF THE RICH DRIVE THE CONSUMPTION OF THE LESS RICH?

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**Overview**

While real incomes in the lower and middle portions of the U.S. income distribution have only risen slightly over the last three decades, incomes in the upper part of the income distribution have risen much more dramatically. At the same time, the saving rate in the U.S. has been in constant decline since the early 1980s. Are these two trends related? We study a consumption mechanism, asking whether rising consumption among the increasingly better off households induces the relatively worse off to spend a higher share of their disposable income.

Our empirical strategy exploits variation across geographic markets and over time to identify the effect of expenditures by the rich on that of the non-rich. We ask whether, everything else held constant, higher levels of consumption by the rich living in a household's relevant market (which we define to be either a state or an MSA in a given year) predicts a higher propensity to consume out of disposable income for the non-rich household.

After establishing that such vertical consumption correlations occur, we then explore possible mechanisms. Our results are most consistent with the view that visible increased consumption by the rich induces status-seeking or status-maintaining consumption by the less rich.

A counterfactual exercise suggests that, had real income at the top of the income distribution grown at the same rate as real income in the middle of the income distribution, the saving rate of the middle class would have been about 1 to 2 percentage points higher by the end of the 2000s.

**The Basic Fact**

We use the CPS MORG to construct percentiles of the household real income distribution by state and year. In each state-year cell, we define the upper income group as the set of households whose income is above the 80$^{th}$ percentile. We then define the rich's consumption in each state-year cell as average total expenditures in the CEX among those households whose real income is above the 80$^{th}$ percentile in that state-year-cell. In computing consumption, we include all items in the CEX except for housing. We then compute total consumption (again except for housing) and consumption to income ratios for all households in the CEX. We exclude housing from our analysis because of obvious concerns regarding the endogeneity of local prices to local income distribution.

Our main empirical specification considers the sample of all households in the CEX whose real income in below the 80$^{th}$ percentile in their state-year cell. We then regress log(consumption) for each household on the logarithm of average consumption among the households whose income is above the 80$^{th}$ percentile in that state-year cell. We absorb the effect of current individual income by including indicator variables for income levels at $2000 increments. Additional control variables include indicator variables absorbing each level of race, education, urban, number of adults, and number of children in the household. We then include state and year fixed effects.

The regression results are presented in Table 1. Holding everything else constant, we find that a 1 percent increase in consumption among the rich translates into about .07 percent increase in consumption among the less rich. The correlation is most pronounced (.09) for middle income households (which we define as households whose real income is between one half the median

income and the 80$^{th}$ percentile). We find no evidence of such consumption spillovers for households whose income become fall poverty line.

--INCLUDE TABLE 1 HERE—

In additional analysis, we established the robustness of these basic results to controlling for average consumption levels among other income groups in the state-year cell. Furthermore, we confirmed that our basic results are robust to redefining the rich as those households whose income is above the 90$^{th}$ percentile in their state-year cell.

We also performed some complementary analysis in the Census, where we can define smaller geographic markets (MSAs) in each Census year. Using an otherwise similar empirical strategy, we found car consumption (measured in terms of number of cars) by the less rich to be very strongly related to car consumption by the local rich (above 80$^{th}$ percentile in the Census year*MSA cell). The census also allows us to look at physical characteristics of housing consumption. Interestingly, we found housing size (measured by number of rooms in a given household's dwelling) by the less rich to be very strongly related to average housing size among the local rich.

**Possible Mechanisms**

We then explored possible mechanism for the vertical consumption externalities documented above. First, we considered the possibility that rising consumption (and income) at the top of the income distribution a given state*year cell is predictive of faster future income growth lower down in the income distribution in the same state. Hence, maybe the less rich are consuming more out of disposable income today in those states where the rich are richer because they rationally expect their future income to rise. We test this possibility in a panel of households in the PSID. Focusing on households whose income is below the 80$^{th}$ percentile, we regress

future income (one year out, two years out, three years out) on current income as well as average income above the 80th percentile. We found no evidence for such a permanent income explanation: holding one's current income constant, the income of the rich is not predictive of future income.

Second, we considered the possibility that low and middle income households in states with higher levels of top incomes have unduly optimistic expectations about their own future income growth. To test for this, we used micro data from the Consumer Sentiment Survey that has been carried out at the University of Michigan since the late 1970s. This survey contains questions on expectations about percent change in family income, as well questions about expectations about future financial well-being. We regress answers to those subjective questions on the logarithm of average income above the 80th percentile in the household's state*year cell, controlling the household own current income and other household characteristics, as well as state and year fixed effects. We failed to find any evidence that lower and middle income households' expectation about future income and financial well-being was positively affected by the income level of the rich in their state.

Interestingly though, and in confirmation of our basic results in the CEX, we found a systematic relationship between lower and middle income households current reported financial well-being and the income of the richer households in their state. Specifically, a higher share of low and middle income households report being financially worse off this year compared to last year when the income of the rich is higher, holding own income constant.

Our preferred explanation for the vertical consumption spillovers we observed in our basic results is that low and middle income households witness the higher consumption levels by the rich and are tempted to also consume more. We developed two empirical approaches to test

for this explanation. First, we replicated our analysis in the CEX by goods category, breaking goods based on how visible consumption of these goods is. We used Ori Heffetz (2011) index and rank goods into 7 categories of increasing visibility. The most visible goods (category 7) according to Heffetz's study, are cars, clothing and shoes (and cigarettes). In contrast, expenditures on, for example, health or legal accounting services are categorized as not very visible.

We then regress, in the sample of households whose real income is below the 80th percentile in their state*year cell, log(consumption) of all goods in a given visibility category on the logarithm of average consumption of the same visibility category goods among the households whose income is above the 80th percentile in that state-year cell. Again, we include indicator variables for income levels, race, education, urban, number of adults, and number of children in the household, as well as state and year fixed effects. Consistent with a consumption contagion explanation, we find the largest vertical consumption spillover among the goods classified as most visible (categories 6 and 7), with estimated elasticities around .145. The only exception to the pattern was with regard to category 1 (the least visible), where we also observed a very large elasticity. However, because category 1 mainly consists of underwear, it is possible that it is often bought in a bundle with other clothing items (most visible category 7).

--INCLUDE FIGURE 1 HERE--

Our second approach to test for contagion effects is to categorize geographic markets based on their level of income segregation. For this analysis, we need a finer geographic market than the state, and thus we limit our analysis to MSA level in the Census data. We hypothesize that, under the consumption contagion explanation, one should observe larger vertical consumption spillovers in those MSAs where the middle and lower income groups live closer to

the rich. Using spatial data on income level by tracts from the Census, we categorize MSAs into bottom, middle and top level of segregation of the rich form the non-rich (using both Echenique and Fryer's (2007) measure of community segregation and a spatial distance measure). We find strong support for our hypothesis when looking at housing size and mild support when looking at car consumption.

We conclude our investigation with a counterfactual exercise. Given the estimated vertical spillovers documented above, what would be consumption expenditures among median income households today had income at the right tail of the income distribution grown at the same rate as income at the median of the income distribution? We estimate that a median income household today would have spent between 1 and 2 percentage points less out of disposable income in 2008 in this counterfactual. While this is only a small share of overall expenditures, this is nevertheless a non-trivial effect which we believe warrants for future research into these top-down consumption spillover effects.

References

Echenique, Frederico and Roland Fryer. 2007. "A Measure of Segregation Based on Social Interactions." Quarterly Journal of Economics, Vol. 122 (2).

Heffertz, Ori. 2011. "A Test of Conspicuous Consumption: Visibility and Income Elasticities." Review of Economics and Statistics, Forthcoming.
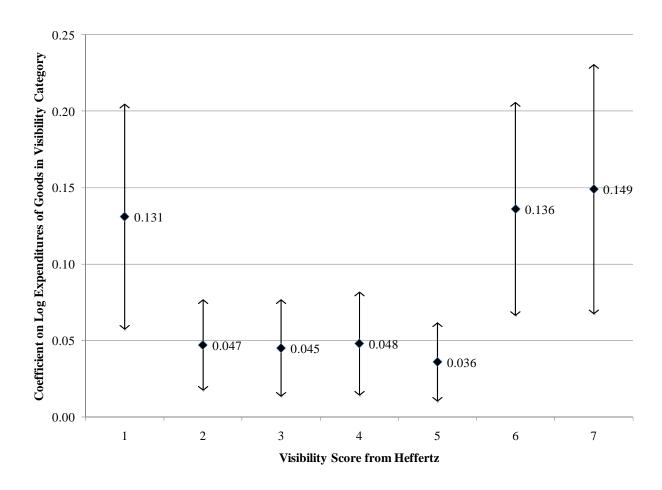
Figure 1: Effect of Rich Expenditures on Non-Rich Expenditures for Each Category of Goods by Visibility

The visibility score (the X-axis) of each good category is that of Heffertz (2011), who combines each UCC good category code in the Consumer Expenditure Survey (CEX) and applies a method to calculate visibility. We take his raw score and bulk items into seven categories (rounding down to the first digit of his score). We throw out all insurance items since they may be intrinsically related to other purchase decisions (auto insurance, home insurance) or the level of income (life insurance). We then run estimations, identical to specification of column 1 in Table 1, except that we limit expenditures to being the sum of expenditures within the visibility category. We run this separately for each visibility score. The Y-axis is the coefficient on the independent variable of the log expenditures of the rich (the 80th percentile and above average) in the state-year. The vertical lines represent the two standard error range.

## Table 1: Effect of Spending by the Rich on Spending of Non-Rich

The dependent variable is the log of total expenditures, excluding housing, of each household in the CEX since 1980 whose income is less than the 80th percentile in the CPS income distribution for that state year. The explanatory variable shown is the state-year average log of expenditures of the rich of all households above the 80th percentile in income for the state-year. Both variables are weighted to the population representation for that portion of the population using CEX weights. Column 1 includes all households below the 80th percentile of income in the state-year, and the remaining three columns break households into poverty, lower and middle classes. Poverty class follows federal guidelines for the year 2000 (we report real income as of 1999), which identifies households in poverty by an income-number of individuals criteria. Lower class ranges from poverty level to individuals making less than half of the median income for the state-year, following a Brookings definition. Middle class ranges from half median income to the 80th percentile. Included are state and year fixed effect. The term absorbing income means that we include dummy variables for the household current income at $2000 increments. Demographic controls include a quadratic of age and dummies for race, education levels, number of children and adults in the household, marital status, and urban location. Robust standard errors, clustered at the state level, are presented. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels respectively.

| Dependent Variable: Log Expenditures of a Non-Rich Individual | | | | |
|---|---|---|---|---|
| Sample Limited to: | All < 80th%ile | Poverty Class | Lower Class | Middle Class |
| Ln Expenditures of Rich | 0.068 [0.017]*** | 0.016 [0.031] | 0.048 [0.024]* | 0.086 [0.021]*** |
| State F.E. | Y | Y | Y | Y |
| Year F.E. | Y | Y | Y | Y |
| Absorbing Income | Y | Y | Y | Y |
| Demographic Controls | Y | Y | Y | Y |
| Clustered at State | Y | Y | Y | Y |
| Observations | 121,818 | 17,132 | 31,100 | 73,586 |
| R-squared | 0.63 | 0.56 | 0.33 | 0.38 |