

Bulk Buying and Inequality

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Motivation

For household necessities like toilet paper, consumption is relatively fixed and predictable. However, smooth consumption does not require smooth expenditures. Using expenditure data, I find that low-income households (making less than \$25k) are more likely to smooth their expenditures by purchasing smaller sizes more frequently while high-income households (making more than \$100k) exhibit “lumpier” expenditures by purchasing larger sizes less frequently.¹ Figure 1 illustrates that low-income households have lower, narrower per-trip expenditures compared to high-income households. Over a year, while high- and low-income households purchase the same quantity of toilet paper, high-income households make 33% fewer trips than average, which is offset by increased per-trip quantities.

Question

What factors are generating these systematic differences in spending for high- and low-income households? In particular, why do low-income households buy small sizes? How important are transportation costs, storage costs, and liquidity constraints to preventing bulk purchasing?

Why Is This Important?

Bulk buying is a commonly accepted way of saving money. Because the marginal dollar is more valuable to a low-income household than a high-income household, it is puzzling that high-income households take advantage of this money-saving technology at higher rates than low-income households. Quantifying these expenditure differences will highlight less visible areas of inequality. Furthermore, quantifying the relative contribution of transportation,

¹The vast majority of households only purchase one package per trip. Households seldom purchase multiple packages of any given size. Households likely realize the value of bulk, so they will purchase one 8-pack instead of two 4-packs.

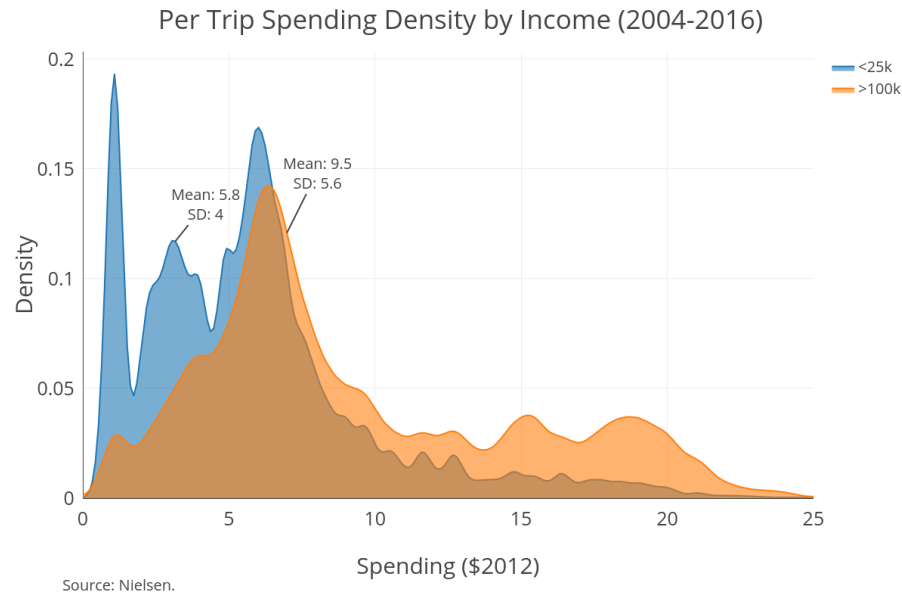


Figure 1

storage, and liquidity constraints will help guide policy solutions to address this inequality. If liquidity constraints are a driving factor, this study will identify and quantify the associated “poverty penalty”.

How to Answer

To estimate transportation and storage costs, I can compare the purchasing of toilet paper with another storable, non-perishable household necessity that does not have substantial transportation and storage costs, such as toothpaste. This will provide some suggestion of how large this effect might be. However, pinning down each of these factors will take more work and I have not yet identified the best way of doing this.

Why Toilet Paper?

Toilet paper is a storable, non-perishable item for which consumption is relatively predictable. Furthermore, it is unlikely that larger purchase quantities imply increased consumption, especially compared to other consumables like soft drinks, chips, or candy. It is offered in a variety of sizes, is available at a range of locations, and has limited dimensions of differentiation (mainly ply, sheet count, and softness).

Follow-Up Question

Does improved access to bulk sizes increase bulk purchasing?

Why Is This Important?

Warehouse club stores like Costco and Sam’s Club have increased their footprint over the past decade. Their bulk sizes provide hefty discounts on a per-unit basis for common household items. High-income households are substantially more likely to shop at a warehouse club compared to low-income households (in a given year, about 70% of high-income households visit a warehouse club compared to about 30% of low-income households). If access is an important factor preventing low-income households from purchasing in bulk, tracking spending before and after a club opening will provide an estimate of how sensitive household spending is when access to this new “technology” becomes available.

How to Answer

Using data on the location and opening dates of warehouse club stores, I can use a linear probability model to estimate how distance (d) affects a household’s likelihood of shopping at a warehouse club (Y) after controlling for household (i), market (m), and time (t) fixed effects.

$$Y_{imt} = \beta_0 + \beta_1 d_{imt} + \lambda_i + \lambda_m + \lambda_t + \epsilon_{imt}$$

Furthermore, since Nielsen records all spending on household nondurables, I would be able to estimate the elasticity of substitution between warehouse clubs and other shopping channels such as grocery stores, discount retailers (like Walmart and Target), and dollar stores.