Food Policy 41 (2013) 18–27

Contents lists available at SciVerse ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

First of the month effect: Does it apply across food retail channels?

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ARTICLE INFO

Article history:
Received 7 May 2012
Received in revised form 31 March 2013
Accepted 9 April 2013
Available online 7 May 2013

Keywords:
Household consumption patterns
Food retail
Low-income food consumption
SNAP payments

ABSTRACT

In this study we use detailed daily scanner data on household food purchases to examine monthly food expenditure patterns across food retail channels. We compare food expenditure patterns in high and low-income households comparing those where Supplementary Nutrition Assistance (SNAP) is received in the first 10 days of the month versus households which receive SNAP over the first 15 days of the month. We find that food expenditure patterns vary systematically across the month within different retail channels by income and SNAP payment schedules. Low-income households in early SNAP distribution areas decrease their grocery and mass/club/superstore expenditures at the end of the calendar month and supplement this decrease with increased food expenditures in convenience stores and food away from home. Households in staggered SNAP payment areas show far fewer systematic patterns given the more distributed payment system.

Introduction

Mounting evidence suggests that individuals and households change their consumption and expenditure behavior based on the timing of income payments or government assistance distributions. This gives rise to the so-called "first of the month effect". The timing of government assistance payments received by poorer households varies by state. The timing of these payments can have significant implications for the distribution of food expenditures throughout the month for recipient households. Food expenditures, given their frequency relative to other purchases, may be especially vulnerable to cyclical fluctuations in purchasing patterns. For example, the *New York Times* (Associated Press, 2006, p. 25) reported that the food expenditure cycle in Michigan was so pronounced in poorer neighborhoods that food retailers were lobbying for a change in the way federal assistance benefits were distributed in order to even out swings in customer traffic, which retailers claimed made it difficult to provide consistent food stocks and staff. Anecdotal evidence further suggests that households may employ different food retail channels depending on the time of the month and the food retail landscape in their community. This study makes three contributions toward a better understanding of food expenditure cycles using detailed household food expenditure data for 1601 households in urban areas throughout the United States. We examine (i) whether household expenditures exhibit cyclical patterns for low- and high-income groups in two sub-samples where Supplementary Nutrition Assistance (SNAP) payments are distributed in different intervals, (ii) if food expenditure patterns vary systematically among food retail channels throughout the month between sub-samples, and (iii) if food expenditures on food-away-from-home vary throughout the month for low- versus high-income households according to SNAP payment schedules.

We estimate household food expenditure patterns in order to derive implications for both private sector retail interests, as well as policymakers concerned with the nutrition and food expenditure patterns in low-income households. Food retailers are interested in within-month expenditure patterns since fluctuations in food expenditures – especially for perishable items such as dairy, meat, and eggs – affect inventory management at the retail level. From a public policy perspective, cyclical purchasing patterns for perishables in low-income households may imply that these households experience monthly disruptions in their nutritional balance or are consuming less healthy foods toward the end of the month.

Our study lies at the intersection of an extensive literature documenting consumers' monthly expenditure patterns and a related group of studies that examine food access and prices depending on a consumer's location. Several studies examining expenditure patterns test the theoretical implications of the permanent income hypothesis which implies that consumption should be unaffected by known changes in income (Stephens, 2003). Hall (1978) and Browning and Collado (2001) report evidence supporting the permanent income hypothesis in the United States and Spain, respectively. These studies suggest that people smooth their consumption and do not concentrate their purchases around income

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http://dx.doi.org/10.1016/j.foodpol.2013.04.005

payments. Other studies suggest that liquidity or credit constraints affect low-income households' consumption behavior (Zeldes, 1989; Jappelli et al., 1998) and that expenditures and consumption decline after the receipt of an income payment (Stephens, 2003; Huffman and Barenstein, 2004).

Several studies have examined expenditure patterns specifically for food. Evidence suggests that low-income households employ cyclical food consumption and expenditure strategies that are dependent on the timing of their paycheck or government transfers (Wilde and Ranney, 2000; Stephens, 2003, 2006; Hastings and Washington, 2010). Wilde and Ranney (2000) find that food stamp recipients cluster their expenditures and typically have one large grocery shopping trip each month as a result of transportation constraints. On the other hand, as Kunreuther (1973) suggests, households with a lack of storage capacity may need to make frequent, small-expenditure trips to nearby stores. Social security checks have also been shown to induce similar food expenditure patterns (Stephens, 2003). More concerning is the finding that this cyclical food shopping pattern results in a drop in food energy intake at the end of the month (Wilde and Ranney, 2000; Shapiro, 2005).

Income and community characteristics influence how much households pay for food as well as where and how they shop. Urban consumers are more likely to shop at smaller grocery stores rather than larger or discount club grocery stores (Chung and Myers, 1999) and pay more for salty snacks, fresh fruits, and vegetables (Steward and Dong, 2011). So-called food deserts, where consumers lack adequate access to healthy food choices, are an increasingly important concern among policymakers.[1] Differences in food environments across communities affect health outcomes of community members (Powell et al., 2007) and result in higher food prices for people in communities where large grocery chains are absent (Steward and Dong, 2011). However, the causal effect between food-deserts and other adverse outcomes has not been conclusively established in the literature.

If low-income urban households are more likely to buy food from smaller, higher-priced retail outlets, especially toward the end of the month, this could imply that the poor are facing higher prices at the same time they are facing binding liquidity constraints. Constraints on low-income households caused by small cash reserves, lack of access to private transportation, and limited home food storage space may make it less attractive to shop in club stores that cater to "stock-up" shoppers. If poor shoppers supplement a monthly grocery store trip with purchases at neighborhood convenience stores and small grocery stores, this implies that low-income households' locations influence their optimal consumption bundles given the higher prices often paid at these smaller stores (Chung and Myers, 1999) and the limited assortment of products they offer. However, exploration of price effects are beyond the scope of this study, which focuses only on cyclical patterns in food expenditure levels across retail channels.

Previous studies establish that low-income shoppers employ cyclical monthly aggregate food (and general) expenditure patterns. This study makes a contribution to this literature by estimating monthly household food expenditures patterns in four different retail channels (grocery, drug, convenience, and mass/club/super stores) as well as aggregate food, and food-away-from-home expenditure patterns. In particular, we are interested in how low-income consumers in two different SNAP distribution regimes allocate their food expenditures among different types of food retail channels. We present findings from an empirical analysis using the 2003 Nielsen Homescan scanner data that documents all household food expenditures for each day in 2003 and the 2003 Consumer Expenditure Survey (CES) that provides a weekly food diary for food-away-from-home expenditures.[2,3] We examine whether households with different income, and SNAP distribution schedules systematically vary food expenditure over the course of a month and whether expenditure patterns change across food retail channels.

In the sections that follow, we discuss a theory of retail choice, describe the data sources and the empirical estimation strategy for this study, present our results, and conclude with a summary discussion.

Theoretical discussion of food purchasing patterns

Kunreuther (1973) provides a formal model of retail choice to predict how households allocate expenditures across different food retail channels. Households maximize their individual utility subject to a fixed food budget that is a function of food prices, quantities, and the cost of transportation from the household to different retail outlets. Further, Kunreuther presents an implicit supply schedule for each good in order to examine the package size effect on consumer purchasing decisions. Kunreuther's model helps frame key factors in a consumer's retail outlet choice such as preferences, retail price, transportation costs, and storage costs.

As Steward and Dong (2011) show, retail price can vary for identical products across retail outlets and food environments. They suggest that price differences are in part due to differences in costs faced by retailers. Price is an important determinant in consumption behavior, however other factors also affect consumers' retail choice, namely cost of transportation, cost of storing the product, and liquidity constraints. If transportation costs between a household and retail outlet are sufficiently high, even though a product may be cheaper in a more distant retail outlet, the consumer may still be willing to pay a higher price at a closer retail outlet, since transportation to the more distant retail outlet would eliminate the price advantage of that store. As Kunreuther points out, the time cost of waiting in line at a large retail outlet can also induce changes in retail preferences.

Inventory or storage costs also differ across households. For households where storage is limited, inventory cost may prevent them from buying in bulk, which may mean paying a higher per unit price for some food products. An important implication of Kunreuther's model is that low-income families who face storage and liquidity constraints will purchase either the same or a smaller optimal package size than higher income households. Another consideration is that household preferences are undoubtedly heterogeneous and their retail choice may be a reflection of these differing preferences interacting with different locations, prices, costs, etc.

Lastly, liquidity constraints cause food purchases by low-income consumers to be concentrated around the time when they receive an income payment or government transfer. In contrast, expenditures by higher income consumer are less sensitive to fluctuations in income. Some authors attribute this pattern to a violation of the permanent income hypothesis (Stephens, 2006), to evidence of differing time preferences, or to quasi-hyperbolic discounting (Huffman and Barenstein, 2004). If households face a liquidity constraint and face different storage and transportation costs, we expect to see differing expenditure patterns across retail

[1] For a review of the literature on food deserts see Beaulac, Kristjansson, & Cummins (2009).

[2] We use a 1601 household subsample of these data to contrast households in two different SNAP distribution areas. Excluded households were either not allocated to a specific market area (primarily rural households), are in market areas where the SNAP disbursement fell outside of our two SNAP schedules of interest, or are not included in our definitions of high or low-income.

[3] We use 2003 data in order to match these data with the comprehensive review of SNAP payment schedules provided by Cole and Lee (2005).