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# Food store access, shopping behavior, and SNAP benefit changes

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## 1 Introduction

Recent policy discussion and research has focused on the role that access to healthy foods plays in the obesity epidemic. A widely reported stylized fact is that low-income neighborhoods have less access to grocery and super stores, and that small format convenience stores to which they do have access are less likely to carry healthy foods (Walker et al., 2010). Neighborhoods that are overly-reliant on convenience stores relative to grocery or super stores are often termed “food deserts”. Policy proposals to address the existence of food deserts have focused on improving the supply of healthy food, either through encouraging grocery stores to open in food deserts, or by encouraging existing stores to stock healthier food options. Another policy to potentially allow households to access a wider variety of food options would be to provide them with more money (Andrews et al., 2013).

This paper uses unprecedented access to administrative data to study the shopping behaviors of SNAP participants in a large Midwestern city to ask whether observed shopping behaviors of SNAP participants are consistent with the conventional food desert wisdom. Specifically, we ask 1) how a benefit increase changes the amount and number of transactions at convenience stores relative to others, and 2) how a benefit increase changes the distance a household travels to purchase food. Households trade off time costs and food costs when choosing where to buy their foods. A benefit increase might lead to households shopping closer to home or further from home depending on whether the time budget or money budget constraint was binding. To answer this question, we leverage the large increase in SNAP benefits that was a part of the 2009 American Reinvestment and Recovery Act (ARRA). The ARRA increased the maximum benefit level by 13.6 percent starting in April, 2009 (U.S. Department of Agriculture, 2011). Studies measuring the impact of the ARRA benefit increase have found conflicting results regarding its impact on shopping behavior. The benefit increase has been found to either slightly increase redemption at convenience stores relative to supermarkets (U.S. Department of Agriculture, 2011), or increase redemption at supermarkets relative to convenience or combination stores (Andrews et al., 2012). Our data allow us to resolve these differences, as well as directly observe how the benefit increase affected households’ choice of

where to shop.

## 2 Data

We utilize an administrative dataset of households participating in the SNAP program in a large Midwestern city, and their electronic benefit transfer (EBT) card transactions and benefit issuances over the period April, 2008-April, 2010. The dataset was provided under a data sharing agreement with the State, and includes basic demographic data for each household and information on each households EBT transactions at the transaction level. Importantly, our data also include the households home address and the name and address of the store. The home address is the address that the household reports to the State, and which the State uses to correspond with the household. Each store reports an address to the State, and the address is included in the administrative EBT data for each transaction. These data allow us to directly observe how far from home a household shops for food using their SNAP benefits, and the type of store the household uses to purchase food.

We are able to geocode 97 percent of the individual household addresses, and 96 percent of the store addresses in our sample. The geocoded addresses allow us to calculate the distance traveled for each transaction. For the purposes of this paper, we compute the Euclidean distance, which has been shown to be highly correlated with network distance and travel time in metropolitan contexts (Apparicio et. al, 2008). The store name data allow us to categorize stores into six types: supercenters, supermarket grocery stores, discount grocery stores (e.g. Aldi), ethnic stores, convenience stores, and other stores. This paper will primarily focus on transactions in convenience stores vs the other stores.

In order to isolate the impact of the ARRA benefit increase from any changes in caseloads, we restrict our analytic sample to the 12,954 households that received and spent SNAP benefits in each month of the entire 2-year time period. Households can receive benefits at any time during the month, so we assign transactions to a household’s “benefit month” rather than the calendar month in which the transaction occurred. The “April” benefit month, for example, would start at

the household's first benefit issuance in April, and extend to the household's first benefit issuance in May. Most months have only one benefit issuance, but for administrative reasons a significant number of months have multiple issuances - the household received benefits on their EBT card twice or more during April, for example. While in any given month most households only have one benefit issuance, about two-thirds of the households in our sample have multiple issuances in at least one month. The amount of benefits given to each household in a month is thus the sum from all benefit issuances in that month.

### 3 Descriptive summary

As shown in Figure 1, the average benefit due to the ARRA increased from about \$180 in the months October-March to about \$215 in April and after. The two red lines in the figure, and all subsequent figures, indicate March and April, 2009. Note that the smaller jump in October coincides with annual cost-of-living adjustments, which take effect every October. Unsurprisingly, as shown in Figure 2 the jump in benefits due to the ARRA translates directly to an increase in the total amount spent each month.

The spending increase can have resulted in more trips to the store, more being spent per store trip, or a combination. Figure 3 shows the average number of household transactions, and Figure 4 shows the average transaction amount. The ARRA benefit change noticeably increased the number of transactions, but the ARRA had little impact on the average transaction amount. Thus, households went to buy food more often, but did not spend more per trip.

If households made more trips to buy food as a result of the ARRA, they could have increased the times they went to the same stores, or they could have spent their money at different stores. Figure 5 displays the average number of unique stores households visited in each month. The number of unique stores visited per household jumps from about 3 to 3.4 due to the ARRA.

To see what potential impact the benefit increase had on convenience stores use, Figure 6 shows the average proportion of a household's monthly expenditure that went to convenience stores. The ARRA had no significant impact overall, though interestingly the amount spent at convenience

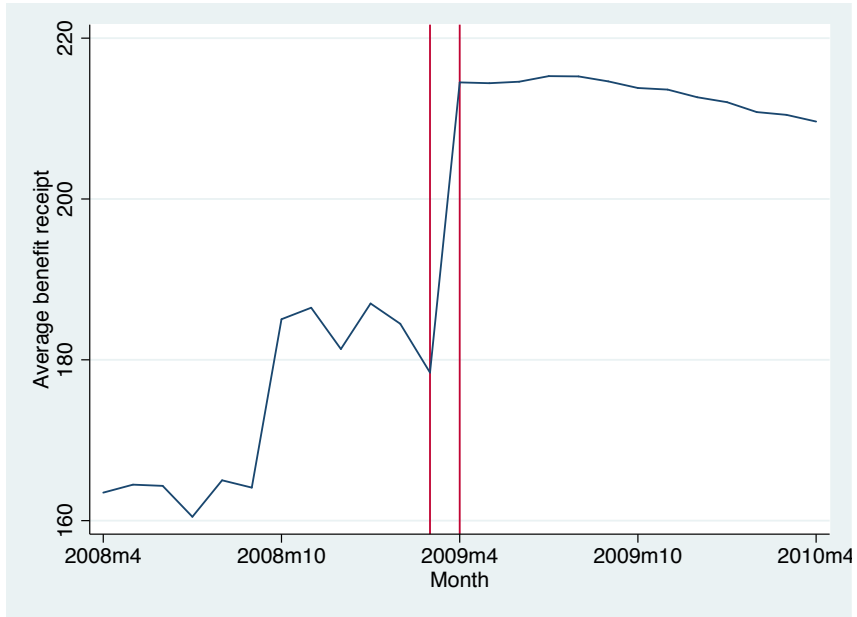


Figure 1: Average total benefit amount per month

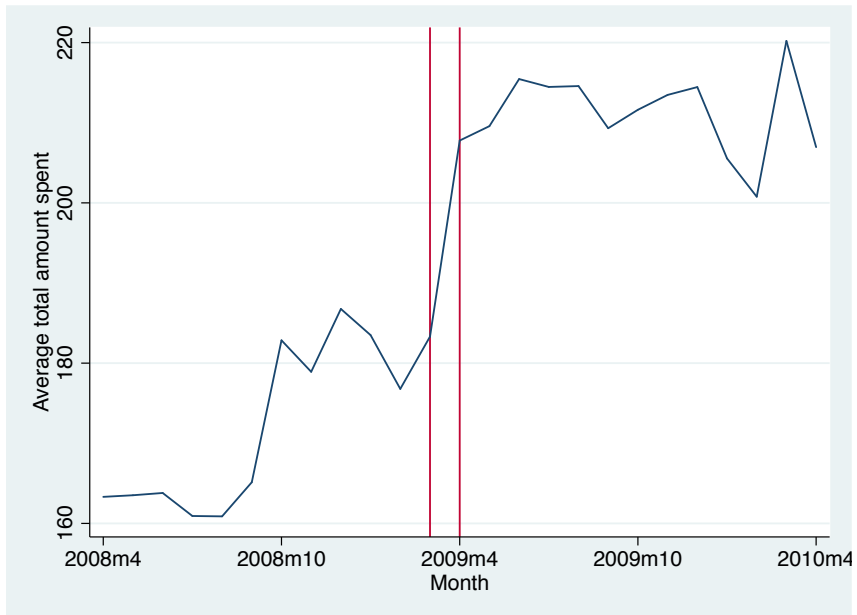


Figure 2: Average total SNAP benefits spent per month



Figure 3: Average number of transactions by household, per month

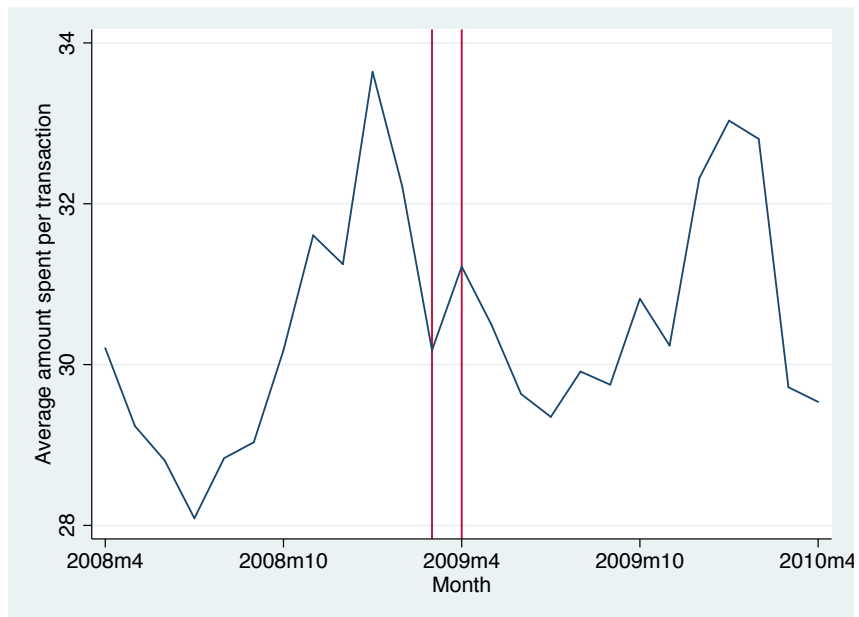


Figure 4: Average transaction amount per month

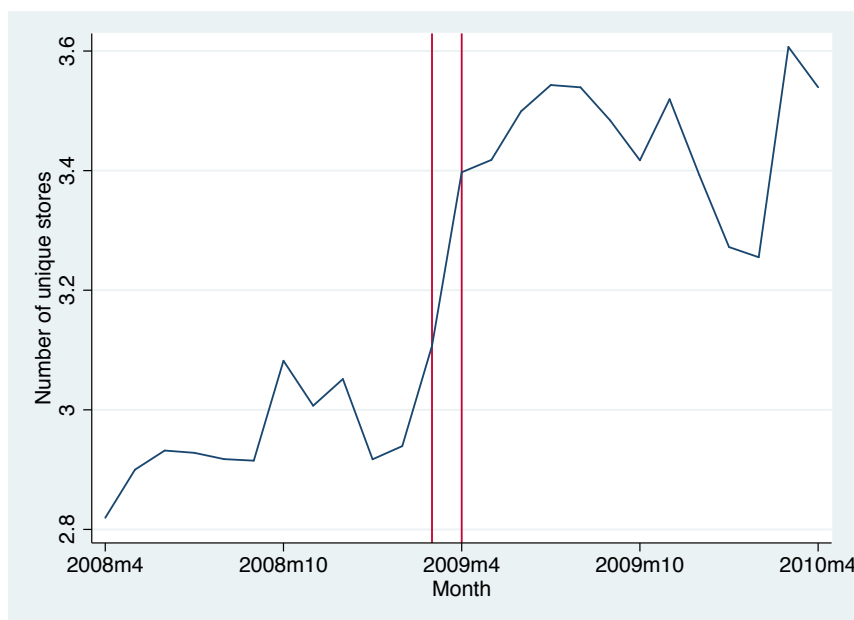


Figure 5: Average unique stores visited per month

stores had decreased by over 1

Finally, we can see whether the benefit increase allowed households to travel further distances. Figure 8 displays the average distance traveled per transaction. While the distance post-ARRA is slightly higher than pre-ARRA, it is not uniformly the case and it is unclear the extent to which this is the result of the ARRA.

## 4 Discussion

In this paper, we have utilized a unique dataset to provide a preliminary analysis of food access and shopping patterns in the context of a SNAP benefit increase. We provided a descriptive summary of the possible impact of the ARRA on shopping patterns related to use of convenience stores as well as the distance traveled to purchase food. Initial observations are that households used the extra SNAP benefits to make more trips to stores, not necessarily to spend more per store. The ARRA did not appear to substantially change spending at convenience stores relative to other stores, but did increase the number of different stores households visited. Whether the ARRA





Figure 6: Average proportion of expenditures spent at convenience stores per month



Figure 7: Average proportion of transactions at convenience stores per month

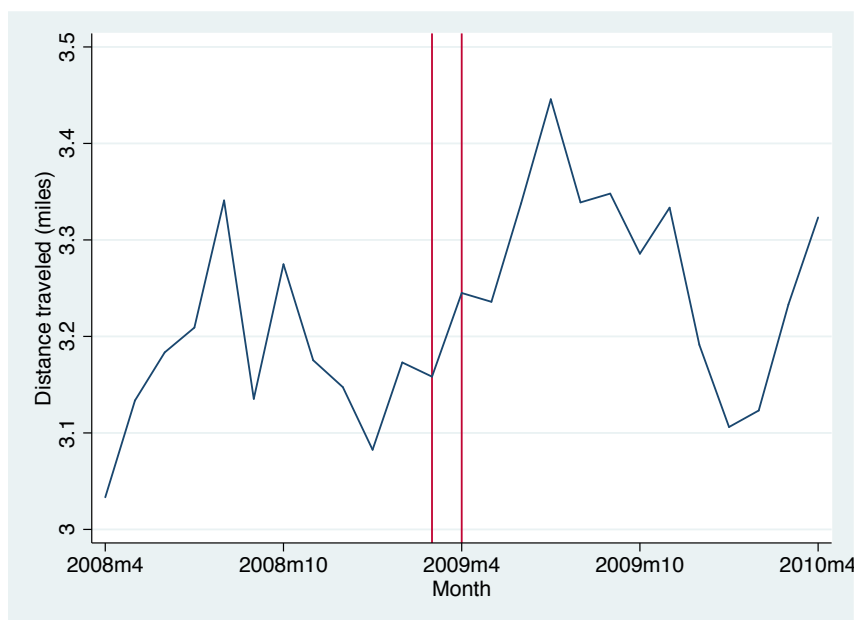


Figure 8: Average distance per transaction

increased distances traveled is a question for further investigation.

## 5 References

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