



# Purchasing Power Expansion and Food Consumption Behavior: Empirical evidence from Thai households

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## Abstract

This study investigates to what extent an increase in purchasing power affects low-income households' food consumption behavior, using Thailand's State Welfare Card program as a quasi-experimental setting. We apply a Regression Discontinuity (RD) design on the 2023 Thai Household Socio-Economic Survey to identify the impact of a regular increase in the ability to spend at the eligibility threshold. The findings demonstrate a strategic reallocation of food expenditures toward fresh and raw food categories. Beneficiaries prioritize at-home meal preparation by significantly expanding expenditures on raw ingredients, specifically meat and seafood, core carbohydrates, and fresh vegetables. In contrast, there is no significant increase in spending on prepared foods, dining out, or discretionary goods such as alcohol and sweets. These results offer critical implications for retail marketing strategies targeting low-to-middle-income segments and provide empirical feedback for policymakers regarding the food expenditure patterns of targeted social assistance. Although our empirical evidence is derived from a cash transfer setting, these behavioral insights may provide useful insights into broader contexts of purchasing power expansion such as standard salary increases or minimum wage adjustments.

**Keywords:** Purchasing power, Consumer behavior, Food consumption, Cash transfer

## Introduction

How do low-income consumers spend when their purchasing power increases? In our context, an increase in purchasing power refers specifically to the regular receipt of additional cash. While literature consistently demonstrates that when more money is on the table, households increase food spending, it leaves a fundamental consumer behavior question unanswered: how does this increased ability to pay alter food consumption modes and food category selection? Using a targeted cash transfer program as an empirical setting to observe expanded purchasing power, this study moves beyond top-line food spending to examine granular consumer choice by addressing two core questions. First, to what extent does an expansion in purchasing power alter household food consumption modes? Second, how do consumers reallocate this incremental ability to purchase across fundamental food categories?

We investigate the impact of purchasing power expansion for low-income households using Thailand's flagship social protection initiative: the State Welfare Card program, as a case. Rather than distributing pure unconstrained cash, the program regularly provides a structured bundle of consumption subsidies earmarked for non-discretionary expenses, including utilities and public transit, as well as a traditional unconditional cash transfer. Because these targeted allocations absorb a baseline share of essential living costs, they effectively free up fluid resources elsewhere in the household budget. We select

Thailand as our empirical case not only for this institutional framework but because the country provides an optimal laboratory for examining food-specific retail dynamics. As a robust agricultural economy, baseline food access is highly convenient, characterized by ubiquitous traditional wet markets, modern retail channels, and the viability of home-grown consumption. The market offers a vast array of dietary choices with clearly demarcated price tiers. Because fundamental food security is broadly attainable, the food consumption shifts observed when purchasing power expands are not merely survival-driven, but rather strategic consumer choices.

Understanding the impact of purchasing power on food consumption patterns and category selection is critical for two main audiences. For businesses and marketers, it illuminates how an expansion in purchasing power affects consumer preferences across food product categories and meal-preparation habits. Equipped with these insights, retailers can proactively optimize product assortments and tailor marketing strategies to capture activated consumer demand. Importantly, although our empirical evidence is derived from a cash transfer setting, these findings may provide useful insights into how financially constrained households respond to broader contexts of purchasing power expansion, such as standard salary increases or minimum wage adjustments. For policymakers, it provides the empirical foundation needed to optimize program design, particularly regarding how structured financial assistance translates into actual retail

spending and meal habits. Also, it helps reveal potential unintended consequences in food expenditure allocation.

Our study leverages cross-sectional microdata from the 2023 Thai Household Socio-Economic Survey, obtained from the National Statistical Office of Thailand. To isolate the impact of expanded purchasing power on consumer choices, we employ a Regression Discontinuity (RD) design. This quasi-experimental approach is ideally suited to our empirical setting because program eligibility is determined by an exogenous threshold—an annual per capita income of 100,000 Baht. Our key outcome variables capture both meal-preparation habits (raw ingredients, semi-processed items, and dining out) and granular retail spending across the five fundamental dietary groups: meat and seafood, rice and grains, vegetables, fruits, and milk products.

Our findings reveal a distinct shift in household food consumption behavior at the eligibility threshold, demonstrating that consumers use expanded purchasing power to reallocate their food expenditures. First, regarding eating habits, households direct their newly freed cash toward raw ingredients for home cooking. They significantly expand their baseline grocery baskets rather than disproportionately shifting to dining out, thereby avoiding built-in service premiums. Second, unpacking their category selection reveals a clear hierarchy of prioritization: consumers allocate the largest share of their incremental spending to core structural categories, driving substantial and statistically significant increases in meat and seafood, alongside staple carbohydrates and vegetables. Finally, this rise proves to be highly functional; despite unconstrained budgets, households do not divert incremental funds toward discretionary categories like alcohol or sweets, indicating a deliberate consumer choice to shift their food expenditure allocation toward fresh meal inputs.

Recent literature examining consumer behavior presents a nuanced view of how purchasing power increments affect retail spending and category-level food consumption, using cash transfer programs as cases. Baker et al. (2023) document rapid consumption increases following an increase in purchasing power, with households directing a substantial portion of these new funds toward food spending. Furthermore, cash injections can drive significant retail shifts; for example, Woo et al. (2022) demonstrate that a shopping coupon program increased expenditures on food and beverages by 50% without impacting entertainment and leisure. Examining dietary quality, Hoddinott and Skoufias (2004) provide evidence that conditional financial assistance in Mexico enabled beneficiaries to acquire more calories from vegetable and animal products. Similarly, a comprehensive review by Bastagli et al. (2019) highlights that increases in purchasing power consistently improve dietary diversity, even when evidence of changes in physical health outcomes remains limited. Habimana et al. (2021) show that unconditional financial assistance in Rwanda boosts recipients' ability to spend, resulting in a marginal increase in total and food consumption while having a null effect on non-food spending. However, consumption impacts are not universally expansive;

for instance, Vannavanit and Takahashi (2025) found no statistically significant evidence of a rise in food spending with a regular increase in purchasing power during the COVID-19 pandemic.

Our study contributes to this strand of literature by demonstrating that an expansion in purchasing power fundamentally affects consumer choice across two distinct dimensions: where they eat and what they consume. Specifically, we provide empirical evidence on how an increased ability to spend drives a strategic shift toward home-preparation modes, while simultaneously enabling households to shift their expenditures toward fresh and raw food categories.

The remainder of this paper proceeds as follows. Section 2 provides the institutional background. Section 3 details the data sources and defines the key variables used in our analysis. Section 4 outlines our empirical strategy, specifically the Regression Discontinuity design. Section 5 presents the estimation. Section 6 provides robustness checks to validate our main findings, and Section 7 concludes.

## Literature Review

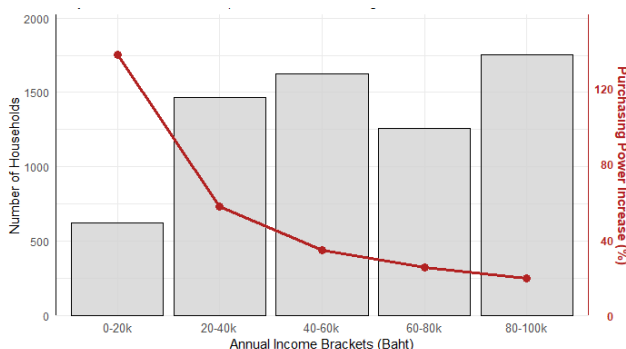
To provide empirical context for our analysis, this study uses Thailand's flagship social protection initiative—the State Welfare Card Scheme (commonly referred to as the Bat Khon Jon program)—as our case study for observing an increase in purchasing power. Initially launched in 2017 to alleviate poverty through direct targeted assistance, the Thai government initiated a comprehensive restructuring and a second major round of national registration in 2022. Registration was formalized through both online portals managed by the Ministry of Finance and physical government channels, including provincial treasury offices, district administrative offices, and branches of the specialized financial institutions. Following this restructuring, the program achieved massive scale; in 2023, approximately 14.6 million individuals received the welfare card, a figure that is six times larger than the 2.39 million Thais officially classified as living below the consumption-based poverty line in the same year (Poonpolkul et al., 2024).

The current eligibility criteria span demographic, institutional, and financial dimensions to rigorously identify vulnerable populations. Demographically, an applicant must hold Thai nationality, be at least 18 years of age, and not belong to explicitly excluded institutional groups, such as Buddhist monks, incarcerated individuals, active civil servants, or government pensioners. Most critically for our empirical strategy, the program imposes strict income and asset-based thresholds. Applicants must be unemployed or have an annual income not exceeding 100,000 Baht, with total liquid financial assets (such as bank deposits or bonds) similarly capped at 100,000 Baht. Crucially, these income threshold are evaluated based on the average per capita levels within the applicant's family unit, providing the exogenous cutoff utilized in our regression discontinuity design.

In addition to income and liquid asset constraints, the state places strict limitations on physical wealth and

debt profiles. Applicants must not own real estate or land, though exceptions are granted if the property falls strictly below legally defined thresholds for residential or agricultural use. Finally, to ensure the program targets individuals without significant financial leverage, applicants are barred from holding any active credit cards and cannot possess outstanding formal loans that exceed established institutional limits.

Approved applicants receive comprehensive benefits, including monthly cash transfers and consumption subsidies. First, beneficiaries receive a monthly allowance of 300 Baht designated for purchasing essential consumer goods, educational materials, and agricultural inputs at designated local shops (Thong Fah shops). Second, the scheme provides an 80 Baht subsidy per person every three months to offset cooking gas expenses. Third, transport mobility is supported through a consolidated public transportation allowance of 750 Baht per person per month, applicable across multiple public transit systems. Fourth, the program includes utility relief consisting of a monthly subsidy of up to 315 Baht per household for electricity and 100 Baht per household for water consumption. Finally, the initiative integrates an additional disability stipend of 200 Baht per month for qualifying individuals. Cumulatively, for a household operating near the 100,000 Baht eligibility threshold, this bundle of full benefits constitutes a substantial and regular increase in their overall purchasing power. By covering these baseline, essential expenses, the program's structured delivery mechanically frees up cash elsewhere in the budget, driving the strategic reallocation of food spending observed in our analysis.

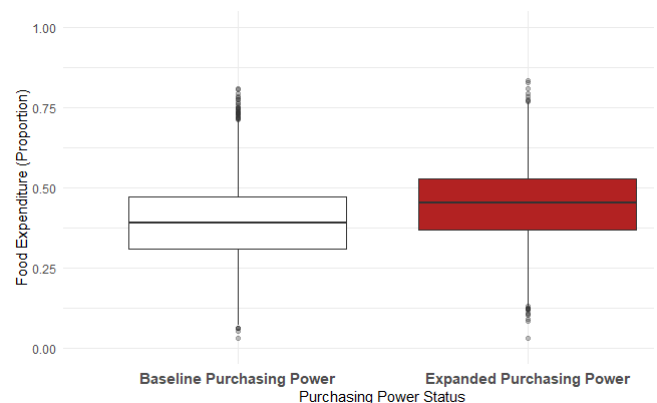


**Figure 1** Distribution of Eligible Households and Relative Purchasing Power Expansion.

Figure 1 illustrates the distribution of eligible households across baseline income brackets alongside the relative magnitude of the purchasing power increase. The bars reveal that beneficiaries are distributed across all lower-income tiers. For households operating near the upper eligibility cutoff (80,000–100,000 Baht), the maximum monetary benefits constitute a highly salient 18% to 20% expansion in purchasing power. For those in the lowest income brackets, the change in purchasing power is profoundly transformative, effectively doubling their baseline financial resources. It is important to note that this figure represents the maximum potential purchasing power expansion rather than unconditional cash-in-hand. Because the program utilizes

earmarked, “use-it-or-lose-it” subsidies (e.g., public transit allowances and utility relief), the actual purchasing power freed up depends on a household’s baseline consumption of these specific services; unutilized balances cannot be converted to cash or rolled over to subsequent months. Across the entire distribution, this structured financial assistance represents an injection of cash, providing low-income consumers with the necessary purchasing power to strategically restructure their grocery baskets and meal-preparation habits.

Having established the substantial magnitude of the purchasing power expansion, it is crucial to justify our empirical focus on retail food behavior. As a fundamental human necessity, food constitutes the absolute base of the hierarchy of human needs, acting as the primary driver of consumer behavior when resources are constrained (Maslow, 1943). For Thailand in particular, food constitutes the largest component of a low-income household’s budget (National Statistical Office, 2023).



**Figure 2** Proportion of Food Expenditure in Total Household Spending

Figure 2 demonstrates this economic reality, revealing that food expenditure was a massive proportion of total household spending—frequently hovering around 40% to 45% of the entire budget for both baseline and expanded purchasing power groups. Therefore, examining food expenditure provides the most salient, highly responsive window into understanding how low-income consumers alter their behavior and dietary choices when budget constraints are relaxed.

## Methodology

### Data and key variables

This study utilizes cross-sectional microdata from the 2023 Thai Household Socio-Economic Survey (SES), a nationally representative dataset administered by the National Statistical Office (NSO) of Thailand. The full survey employs a comprehensive sampling framework covering 49,664 households nationwide. The SES provides highly disaggregated data on household income, revenues, and consumption expenditures across diverse product and service categories.

In addition to granular consumption metrics, the survey captures detailed information on household demographic

characteristics, socio-economic backgrounds, and financial conditions. To ensure data quality and minimize measurement error, the NSO collects these data through structured, face-to-face interviews. Given its extensive coverage and granular expenditure variables, this dataset provides an ideal empirical setting to analyze the impacts of expanded purchasing power on disaggregated consumer behavior.

To ensure empirical comparability between households with baseline and expanded purchasing power, we apply two targeted sample restrictions. First, we restrict our analytical sample to households with an annual per capita income of no more than 200,000 Baht. This restriction focuses our sample on a relatively homogeneous sub-population surrounding the eligibility threshold of 100,000 Baht, maximizing local comparability. Second, we systematically exclude households whose primary income sources are derived from self-employment. Because per capita income determines program eligibility, and informal or entrepreneurial revenues are notoriously difficult to verify accurately due to high volatility and reporting friction, excluding these households minimizes potential measurement error and ensures the precision of our threshold estimations.

To evaluate how increased purchasing power affects consumer spending patterns and category-level demand, we construct our dependent variables using two complementary functional forms: monetary expenditure levels and natural logarithmic transformations. When targeted subsidies enhance consumer purchasing power, analyzing expenditure levels in Thai Baht allows us to quantify the absolute scale and monetary magnitude of category change. Concurrently, applying a natural logarithmic transformation accounts for right-skewness in transaction data and captures proportional demand responsiveness, reflecting the relative spending adjustments across distinct retail categories.

Table 1 reports baseline descriptive statistics for household food consumption and covariates across 19,759 observations. All figures are expressed in Thai Baht equivalents to comprehensively capture both monthly purchased goods and non-paid consumption, such as home-grown produce and in-kind transfers. As shown in Panel A, typical household spending is heavily anchored in fresh proteins and core carbohydrates. Meat and seafood command the largest allocation at a median of 3,936 Baht per month, followed by rice and staple grains at a median of 1,776 Baht and fresh vegetables at a median of 1,428 Baht. Because Thailand features extensive coastlines along both the Andaman Sea and the Gulf of Thailand, marine

resources are abundant, consequently, seafood functions as a ubiquitous dietary staple rather than a luxury commodity. Fresh fruits and milk products form a secondary tier of monthly outlays, with median expenditures of 840 Baht and 600 Baht, respectively, while cooking fats and oils register a median of 192 Baht. In contrast, discretionary consumables exhibit lower typical outlays: desserts and sweets account for a median of 240 Baht, whereas both alcoholic and non-alcoholic beverages record medians of 0 Baht, indicating that the majority of sample households report zero purchases in these categories. This pattern reflects consumer habits, where the vast majority of households rely on domestic, non-packaged water sources for daily hydration—costs that are captured under general utility expenditures rather than retail grocery outlays—while largely abstaining from regular alcohol purchases.

Regarding program eligibility and program participation in Panel B, the summary statistics highlight a critical distinction between meeting the administrative criteria and actively utilizing the benefit. Within our restricted analytical sample, 51.1% of households qualify for the State Welfare Card based on observed survey income, yet actual program participation stands at 40.1%. This imperfect compliance stems from two primary mechanisms. First, eligible households may fail to enroll (“no-shows”) due to well-documented welfare frictions (Banerjee & Duflo, 2019), including the social stigma of poverty labels, information gaps, and the transaction costs of registration. Second, apparent “crossovers” arise from data limitations, as our eligibility variable relies on self-reported survey income rather than the government’s verified administrative records. Given these behavioral frictions and data discrepancies, we employ a reduced-form (Intent-to-Treat) specification in the main analysis. This approach directly estimate the effect of expanding the policy threshold regardless of actual take-up and will be discussed more in the next section.

In terms of predetermined demographic and socio-economic characteristics in Panel C, the sample reflects a mature, low-to-middle-income household profile. The average age of the household head is 54.3 years with a median family size of 2 members. Half of the household heads are married, while binary baseline coverage checks indicate that 64.3% already hold some form of health welfare benefits and 3.0% receive an elderly allowance. The close alignment between the mean and median values across the primary consumption categories underscores the distributional stability of the sample, validating the use of this data for our localized threshold estimations.

**Table 1** Descriptive statistic.

| Variable                | Mean | Median | SD   | N     |
|-------------------------|------|--------|------|-------|
| <i>Panel A: Outcome</i> |      |        |      |       |
| Meat & Sea food         | 4563 | 3936   | 4061 | 19759 |
| Milk products           | 1160 | 600    | 1742 | 19759 |
| Rice & Grains           | 2197 | 1776   | 1778 | 19759 |

| Variable                                                                    | Mean   | Median | SD     | N     |
|-----------------------------------------------------------------------------|--------|--------|--------|-------|
| Vegetables                                                                  | 1665   | 1428   | 1466   | 19759 |
| Fruits                                                                      | 1175   | 840    | 1398   | 19759 |
| Fat and oils                                                                | 282    | 192    | 284    | 19759 |
| Non-alcoholic beverage                                                      | 235    | 0      | 355    | 19759 |
| Alcoholic beverage                                                          | 429    | 0      | 1448   | 19759 |
| Dessert & sweets                                                            | 486    | 240    | 699    | 19759 |
| <i>Panel B: Treatment</i>                                                   |        |        |        |       |
| Purchasing power expansion<br>(1 = Participate in the program, 0 otherwise) | 0.401  | 0      | 0.490  | 19759 |
| Purchasing power eligibility<br>(1 = Eligible for the program, 0 otherwise) | 0.511  | 1      | 0.499  | 19759 |
| <i>Panel C: Covariate (control)</i>                                         |        |        |        |       |
| Age                                                                         | 54.297 | 55     | 15.746 | 19759 |
| Religion (1 = Buddhist, 0 otherwise)                                        | 0.916  | 1      | 0.278  | 19759 |
| Language (1= Thai, 0 otherwise)                                             | 0.906  | 1      | 0.292  | 19759 |
| Disability (1 = Disable, 0 otherwise)                                       | 0.007  | 0      | 0.086  | 19759 |
| Marriage (1 = Married, 0 otherwise)                                         | 0.500  | 1      | 0.500  | 19759 |
| Household Member (s)                                                        | 1.967  | 2      | 0.960  | 19759 |
| Health Welfare (1 = Had welfare, 0 otherwise)                               | 0.643  | 1      | 0.479  | 19759 |
| Elderly Allowance (1 = Had allowance, 0 otherwise)                          | 0.030  | 0      | 0.170  | 19759 |

**Table 2** Falsification test on null treatment effects of pre-determined covariate.

| Variable          | RD Estimate | Std. Error | Bandwidth | Effective Obs. |
|-------------------|-------------|------------|-----------|----------------|
| Age               | 7.018***    | 1.198      | 34143     | 9608           |
| Religion          | -0.019      | 0.02       | 44947     | 12177          |
| Disability        | 0.002       | 0.004      | 50232     | 13239          |
| Marriage          | 0.039       | 0.038      | 34969     | 9693           |
| Member            | 0.011       | 0.067      | 26461     | 7938           |
| Health welfare    | 0.015       | -0.039     | 29000     | 8530           |
| Elderly allowance | 0.013       | -0.011     | 47499     | 12645          |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### Empirical strategy

The eligibility criteria, particularly the distinct income, create discontinuities in eligibility. Consequently, it offers a highly robust setting for implementing quasi-experimental methods to isolate the causal impacts of purchasing power expansion on subsequent consumer choices at the threshold. To identify the causal effects of the additional purchasing power on consumer behavior, this study employs a Regression Discontinuity (RD) design. This non-experimental approach is uniquely suited to our setting because eligibility is determined, pre-specified institutional cutoffs. Following Lee and Lemieux (2010), the internal validity of our RD estimates rests on the fulfillment of three core assumptions: (1) continuity of unobservable, (2) discontinuity in first-stage relationship, and (3) the exclusion restriction.

The continuity assumption requires that all unobserved factors affecting consumer choices vary continuously across the eligibility threshold. Intuitively,

this assumption is satisfied if individuals have “imprecise control” over their running variable near the cutoff, rendering treatment assignment as good as random within a local neighborhood. Here, we selected per capita annual income as our running variable because it is relatively better at quantitatively capturing treatment status than other continuous profile such as saving which could be subject to household risk appetite and investment preference.

To formally validate this assumption, we perform a robust density test on the running variable to ensure individuals cannot precisely manipulate their eligibility status. Consistent with the continuity assumption, we find no statistical evidence of discontinuous sorting at the 100,000 Baht threshold (see Appendix, Table A1). Furthermore, sorting around the cutoff is structurally difficult in this setting; eligibility is tied to pre-determined administrative benchmarks—such as property ownership, active credit cards, and bank deposit volumes—verified through rigorous

cross-agency digital audits rather than easily manipulated self-reports.

We further validate the assumption by performing a falsification test on a comprehensive vector of predetermined household characteristics. Table 2 presents the estimation results across fundamental socio-economic and demographic baseline dimensions. The point estimates reveal that crossing the eligibility threshold has no statistically significant effect on all dimensions with the exception of age, which is included as a covariate in the formal analysis. The coefficients remain statistically indistinguishable from zero, and the optimal localized bandwidth choice behaves stably across the independent metrics. This systemic absence of discontinuous shifts at the threshold provides strong empirical evidence that households do not strategically manipulate their standing around the cutoff.

The age difference observed in Table 2 reflects a life-cycle dynamic within the Thai labor market, specifically given our sample restrictions. Because our analysis systematically excludes households whose primary income sources are derived from self-employment, the households remaining in our sample consist of workers who frequently exit the formal labor force via retirement as they reach their mid-to-late 50s. This transition causes a systemic drop in their reported per-capita income. Consequently, the population falling just below the eligibility threshold is structurally older compared to those just above the threshold who are still actively earning in the formal workforce. Therefore, this discontinuity does not indicate manipulative sorting around the cutoff, but rather an accurate reflection of the formal labor force life-cycle. Nevertheless, to ensure that this demographic variation does not confound our estimates, we incorporate age—alongside all other observed household characteristics—as control covariates in all of our model specifications.

The second foundational assumption requires a discontinuity in the probability of receiving the welfare card at the eligibility cutoff. In field settings, a common empirical challenge stems from measurement friction: self-reported income captured in household surveys can deviate from the official administrative records used by the state to determine eligibility.

As documented in Table 3 and illustrated in Figure 3, crossing the eligibility threshold induces a highly significant, immediate jump of 57.2 percentage points in the probability of program take-up at the cutoff. This robust first-stage discontinuity confirms that the threshold holds substantial operational bite in practice, validating the plausibility and strength of our empirical framework.

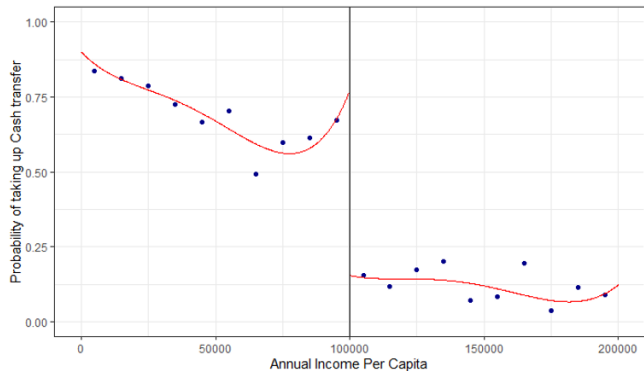
**Table 3** First stage Program Take Up.

|                 | (1)<br>Taking up |
|-----------------|------------------|
| RD_Estimate     | 0.572*** (0.000) |
| Bandwidth       | 16841            |
| Order Loc. Poly | 2                |

|                |            |
|----------------|------------|
| Kernel         | Triangular |
| Effective obs. | 5669       |
| Total obs.     | 19759      |

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Figure 3** First stage Program Take Up.

The final assumption, exclusion restriction, dictates that crossing the eligibility threshold affects consumer behavior only through an increase in purchasing power or the eligibility and receipt of the state welfare card. The primary threat to this exclusion restriction would be a confounding policy that utilizes the exact same financial cutoffs. However, a comprehensive review of Thai social policy that could impact consumer purchasing power confirms that this specific threshold is unique to the State Welfare Card Scheme. Because other public safety nets in Thailand target distinct demographic groups using independent criteria tailored to specific social needs, the exclusion restriction holds robustly in our empirical setting.

When implementing the RD framework, empirical estimation introduces an operational tradeoff between localized bias and statistical precision. Restricting the analytical sample to observations in ultra-proximity to the institutional threshold minimizes structural bias by comparing highly identical households; however, this strategy dramatically inflates variance if the localized sample size is constrained. To systematically optimize this tradeoff, we adopt a data-driven bandwidth selection procedure following Calonico et al. (2014), which minimizes the Mean Squared Error (MSE) criterion to establish optimal bandwidths above and below the cutoff. Across all specification, the set of predetermined covariate in Table 1 is included in the regression.

Our primary analysis strategically prioritizes the reduced-form (Intent-to-Treat, or ITT) estimations. We lean on the reduced-form specifications for three reasons: First, as documented in our first-stage analysis, the observed threshold features imperfect compliance, with a take-up jump of 57.2 percentage points. Running a full instrumental variable specification divides the reduced-form impact by this first-stage compliance rate, which mechanically scaling up the point estimates and can inflate standard errors. Interpreting the reduced form avoids this artificial inflation, offering a more conservative and grounded estimate.

Second, from an institutional design and policymaking perspective, the reduced-form coefficient captures the net impact of making the program available to the population. Because policy executives can control program rules but cannot enforce perfect compliance, the ITT effect represents the realistic, operationally relevant metric for purchasing power increase evaluation.

Third, the reduced form relies strictly on the random assignment mechanism of the threshold itself. It strictly does not require the stringent assumption that the threshold only impacts household behavior through actual card utilization, providing a robust causal benchmark.

### Results and Discussion

#### 1. Effect on Disaggregated Food Consumption and Channels

To examine how expanded consumer purchasing power affects consumer food choice and grocery spending dynamics, we segment total food expenditures into two distinct retail and consumption channels: at-home meal preparation and food away from home (food service and commercial dining). Within the at-home domain, we differentiate between raw ingredients (requiring domestic

**Table 4** Effect on Disaggregated Food Consumption and Channels.

|                 | Food at home              |                           |                                        |                                     | Food away from home |                   |
|-----------------|---------------------------|---------------------------|----------------------------------------|-------------------------------------|---------------------|-------------------|
|                 | (1)<br>Raw<br>Ingredients | (2)<br>Raw<br>Ingredients | (3)<br>Prepared &<br>Processed<br>Food | (4)<br>Prepared &<br>Processed Food | (5)<br>Dining out   | (6)<br>Dining out |
| RD_Estimate     | 0.182***<br>(0.069)       | 796**<br>(368)            | -0.019<br>(0.065)                      | -178<br>(271)                       | -0.197<br>(0.166)   | -101<br>(251)     |
| Bandwidth (L/R) | 23007 /<br>22758          | 21804 /<br>27307          | 31502 /<br>34666                       | 28798 / 17737                       | 30231 /<br>26511    | 22417 / 22238     |
| Functional Form | Log                       | Level                     | Log                                    | Level                               | Log                 | Level             |
| Order Loc. Poly | 2                         | 2                         | 2                                      | 2                                   | 2                   | 2                 |
| Kernel          | Triangular                | Triangular                | Triangular                             | Triangular                          | Triangular          | Triangular        |
| Effective obs.  | 7209                      | 7547                      | 9248                                   | 7194                                | 8203                | 7142              |
| Total obs.      | 19759                     | 19759                     | 19759                                  | 19759                               | 19759               | 19759             |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Across these consumption channels, the empirical findings demonstrate that consumer basket expansion is concentrated exclusively in primary, home-cooked grocery inputs. In the logarithmic specification (Column 1), program eligibility yields a statistically significant increase of approximately 18.2 percent in raw ingredient spending ( $p < 0.01$ ), corresponding to an average absolute increase of approximately 796 Baht per household (Column 2,  $p < 0.05$ ). Conversely, estimated coefficients for prepared and processed convenience items (Columns 3 and 4) and commercial dining out (Columns 5 and 6) are negative and statistically indistinguishable from zero across both specifications. These results indicate that when low-income consumers experience an expansion in purchasing power, they adjust their food expenditure allocation to prioritize core grocery staples and raw cooking

food preparation labor) and prepared and processed foods (ready-to-eat takeout items, instant noodles, and shelf-stable packaged goods). This classification allows us to observe whether expanded consumer purchasing power stimulates scratch cooking, convenience-driven packaged goods demand, or out-of-home food service consumption. Table 4 presents the reduced-form Regression Discontinuity estimates for each food consumption channel.

For each category, we report results under two complementary functional forms: an odd-numbered column presenting the natural logarithmic specification to capture proportional demand shifts and relative elasticities, followed by an even-numbered column presenting the level specification in Baht to quantify absolute monetary basket expansion. All models are estimated using local quadratic polynomials (order 2) with a triangular kernel and data-driven Mean Squared Error optimal bandwidths selected separately above and below the cutoff. Robust standard errors are reported in parentheses directly below each point estimate. To maintain methodological consistency, this empirical specification is applied uniformly throughout the remainder of the estimation results section to evaluate all subsequent outcome variables.

ingredients over processed convenience goods or outsourced dining options.

#### 2. Effect on Carbohydrate and Protein Expenditures

To examine how increasing purchasing power affects consumer grocery baskets, we evaluate expenditures across five fundamental categories based on main nutrient groups: proteins, carbohydrates, vegetables, fruits, and cooking fats and oils. In this section, we begin by analyzing the core macronutrients—proteins (disaggregated into meat and seafood versus dairy products) and carbohydrates (rice and staple grains)—before evaluating other groups in the subsequent table. This decomposition enables us to test whether low-income consumers merely scale up expenditures or actively reallocate their grocery budgets toward fresh meat and seafood upon receiving a regular purchasing power

increment. Importantly, while we classify these expenditures by their primary nutrient profiles to observe consumer prioritization, our data strictly measures the retail allocation of expanded purchasing power rather than direct dietary or physiological outcomes. Table 5 presents the reduced-form Regression Discontinuity estimates focusing exclusively on these two nutrient groups.

**Table 5** Effect on Protein and Carbohydrate Expenditures.

|                 | Protein             |                  |                  |                  | Carbohydrates      |                  |
|-----------------|---------------------|------------------|------------------|------------------|--------------------|------------------|
|                 | (1)                 | (2)              | (3)              | (4)              | (5)                | (6)              |
|                 | Meat & Sea food     | Meat & Sea food  | Milk products    | Milk products    | Rice & Grains      | Rice & Grains    |
| RD_Estimate     | 0.626***<br>(0.174) | 499***<br>(191)  | 0.176<br>(0.156) | -17.0<br>(96.9)  | 0.198**<br>(0.086) | 235***<br>(84)   |
| Bandwidth (L/R) | 17076 /<br>28079    | 27376 /<br>24132 | 19803 /<br>28153 | 21241 /<br>22763 | 21736 /<br>27950   | 22501 /<br>26536 |
| Functional Form | Log                 | Level            | Log              | Level            | Log                | Level            |
| Order Loc. Poly | 2                   | 2                | 2                | 2                | 2                  | 2                |
| Kernel          | Triangular          | Triangular       | Triangular       | Triangular       | Triangular         | Triangular       |
| Effective obs.  | 7024                | 7804             | 7178             | 7565             | 7565               | 7533             |
| Total obs.      | 19759               | 19759            | 19759            | 19759            | 19759              | 19759            |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Following the previous empirical setup, across these two categories, the empirical findings demonstrate that consumer spending expansion is driven jointly by animal proteins and core carbohydrates. In the logarithmic specification, program eligibility yields a statistically significant increase of approximately 62.6 percent in meat and seafood expenditures ( $p < 0.01$ , Column 1), corresponding to an average absolute increase of approximately 499 Baht per household ( $p < 0.01$ , Column 2). In contrast, while spending on milk and dairy products remains statistically indistinguishable from zero across both specifications (Columns 3 and 4), spending on core carbohydrates—rice and grains—exhibits a smaller but statistically significant expansion of approximately 19.8 percent in logs ( $p < 0.05$ , Column 5) and 235 Baht in levels ( $p < 0.01$ , Column 6).

These results reveal that while eligible consumers expand their core grain expenditures, they channel their incremental budget toward fresh meat and seafood, reflecting a deliberate shift in the allocation of purchasing power toward protein-dense inputs once budget constraints are relaxed.

### 3 Effect on Vegetables, Fruits, and Culinary Fats Expenditures

To complete the evaluation across the five fundamental food groups, we examine household expenditure on vegetables, fruits, and fats and oils. This analysis reveals whether the surge in home cooking and protein acquisition is complemented by essential culinary inputs and fresh produce, or whether consumers treat certain produce categories as discretionary.

**Table 6** Effect on Vegetables, Fruits, and Culinary Fats Expenditures

|                 | (1)                 | (2)              | (3)              | (4)              | (5)              | (6)              |
|-----------------|---------------------|------------------|------------------|------------------|------------------|------------------|
|                 | Vegetables          | Vegetables       | Fruits           | Fruits           | Fats & oils      | Fats & oils      |
| RD_Estimate     | 0.401***<br>(0.133) | 118*<br>(67)     | 0.058<br>(0.162) | -76.2<br>(73.3)  | 0.17*<br>(0.088) | 20.0<br>(14.5)   |
| Bandwidth (L/R) | 20926 /<br>36771    | 29540 /<br>29321 | 32051 /<br>23255 | 21308 /<br>23519 | 23422 /<br>36442 | 25380 /<br>29155 |
| Functional Form | Log                 | Level            | Log              | Level            | Log              | Level            |
| Order Loc. Poly | 2                   | 2                | 2                | 2                | 2                | 2                |
| Kernel          | Triangular          | Triangular       | Triangular       | Triangular       | Triangular       | Triangular       |
| Effective obs.  | 8624                | 8566             | 8269             | 7177             | 8778             | 8248             |
| Total obs.      | 19759               | 19759            | 19759            | 19759            | 19759            | 19759            |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6 presents the reduced-form Regression Discontinuity estimates for the remaining categories. The empirical findings demonstrate that spending expansion is primarily concentrated on fresh vegetables. In the logarithmic specification, program eligibility drives a statistically

significant increase of approximately 40.1 percent in vegetable spending ( $p < 0.01$ , Column 1), corresponding to an absolute increase of approximately 118 Baht per household ( $p < 0.1$ , Column 2). In contrast, spending adjustments across the other two categories are substantially

more muted: cooking fats and oils exhibit only a marginally significant proportional shift of approximately 17.0 percent in logs ( $p < 0.1$ , Column 5) with no statistically distinguishable change in level terms in Column 6, while fruit expenditures show no meaningful response across either specification (Columns 3 and 4). These patterns suggest that when recipient households expand their home meal preparation, their produce expenditures are directed toward essential culinary vegetables that complement core meat and grain dishes, rather than standalone fruit consumption.

4. Effect on Beverages and Desserts

Beyond the five core nutrient groups, we examine household expenditures across discretionary and non-essential consumables: non-alcoholic beverages, alcoholic beverages, and sweets and desserts. Evaluating these categories allows us to test whether expanded purchasing power spills over into temptation goods or indulgent consumption, addressing a central question in consumer behavior and public policy regarding whether purchasing power injections distort household spending toward discretionary items.

Table 7 presents the reduced-form Regression Discontinuity estimates for each discretionary category. The empirical findings reveal that consumer basket expansion

in discretionary goods is confined to non-alcoholic beverages. In the logarithmic specification, program eligibility yields a statistically significant increase of approximately 39.6 percent in non-alcoholic beverage expenditures ( $p < 0.05$ , Column 1), though the corresponding absolute monetary increase of approximately 22 Baht is not statistically distinguishable from zero (Column 2).

Consequently, this proportional effect in Column 1 should be interpreted with caution, as a relatively low baseline expenditure allows small monetary fluctuations to produce mathematically massive percentage shifts that are not consistent with true economic magnitude. In contrast, point estimates for alcoholic beverages (Columns 3 and 4) and sweets (Columns 5 and 6) remain statistically indistinguishable from zero across both log and level formulations. Furthermore, re-estimating the model restricted strictly to the subsample of households with alcohol consumption yields identical null results, confirming that expanded purchasing power does not induce greater spending even along the intensive margin. These results indicate that low-income consumers do not divert an increased ability to spend toward temptation goods, reinforcing the finding that purchasing power expansions are primarily channeled into core household meal inputs rather than indulgent snacking or alcohol consumption.

Table 7 Effect on Beverages and Desserts.

|                 | (1)<br>Non-alcoholic<br>beverage | (2)<br>Non-alcoholic<br>beverage | (3)<br>Alcoholic<br>beverage | (4)<br>Alcoholic<br>beverage | (5)<br>Dessert &<br>sweets | (6)<br>Dessert &<br>sweets |
|-----------------|----------------------------------|----------------------------------|------------------------------|------------------------------|----------------------------|----------------------------|
| RD_Estimate     | 0.396**<br>(0.171)               | 21.50<br>(17.57)                 | -0.035<br>(0.158)            | -68.3<br>(67.9)              | 0.104<br>(0.129)           | -21.2<br>(34.0)            |
| Bandwidth (L/R) | 21439 /<br>26196                 | 21916 /<br>36522                 | 22662 /<br>22986             | 27773 /<br>28100             | 18492 /<br>36555           | 29192 /<br>29055           |
| Functional Form | Log                              | Level                            | Log                          | Level                        | Log                        | Level                      |
| Order Loc. Poly | 2                                | 2                                | 2                            | 2                            | 2                          | 2                          |
| Kernel          | Triangular                       | Triangular                       | Triangular                   | Triangular                   | Triangular                 | Triangular                 |
| Effective obs.  | 7411                             | 8686                             | 7179                         | 8377                         | 7962                       | 8532                       |
| Total obs.      | 19759                            | 19759                            | 19759                        | 19759                        | 19759                      | 19759                      |

Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

5. Robustness check

To ensure the validity of our main findings and rule out the presence of false positives, we subject the observed shifts in consumer behavior to a series of rigorous sensitivity tests. Importantly, to isolate coefficient sensitivity without the confounding effect of fluctuating sample sizes, the “Baseline Model” utilized throughout this robustness matrix employs an optimal bandwidth constrained to maintain a fixed and symmetric number of observations on both sides of the threshold. This methodological choice differs deliberately from the unconstrained, asymmetric MSE-optimal bandwidths reported in the main estimation results.

Against this fixed baseline, we implement three core robustness checks. First, we test for potential non-linear distortions or overfitting by evaluating our models under progressively higher polynomial orders, running estimations up to a third-order specification (Cattaneo et al., 2019).

This ensures that the documented shifts in consumption reflect robust behavioral adjustments around the threshold rather than being disproportionately skewed by extreme or outlying household observations. Second, we vary the underlying statistical weighting scheme. We replace our primary triangular data-weighting approach with two alternative standard weighting profiles: the Epanechnikov and Uniform distribution models. This variation ensures that our results do not depend on an isolated mathematical assumption regarding how close or far a household sits from the eligibility cutoff.

First, we test for potential non-linear distortions or overfitting by evaluating our models under progressively higher polynomial orders, running estimations up to a third-order specification (Cattaneo et al., 2019). This ensures that our documented shifts in consumption are driven by real behavioral adjustments around the threshold rather than being disproportionately skewed by extreme or outlying

household observations. Second, we vary the underlying statistical weighting scheme. We replace our baseline data-weighting approach with two alternative standard weighting profiles: the Epanechnikov and Uniform distribution models. This variations test ensures that our results do not depend on an isolated mathematical assumption regarding how close or far a household sits from the eligibility cutoff. Finally, because measured behavioral responses can fluctuate depending on the strictness of the sample boundaries, we run a localized bandwidth sensitivity test (Cattaneo et al., 2024). We systematically restrict the observation windows to 50% of the symmetric baseline bandwidth established in this appendix.

As demonstrated in the Appendix (Tables A2 to A9), the direction, magnitude, and statistical significance of our main results remain highly stable across all alternative specifications. These sensitivity tests confirm that the observed consumption pivots are not random variations in the sample data.

### Conclusions

This study provides empirical evidence on how an expansion in purchasing power affects the food consumption modes and category selections of low-income households. By exploiting the eligibility threshold of Thailand's State Welfare Card program through an RD design, we demonstrate that when budget constraints are relaxed, households increase their spending on at-home food preparation. Rather than expanding expenditures on convenience foods or dining out, beneficiaries direct their newly freed purchasing power toward raw ingredient expenditures for home cooking, most notably meat and seafood, alongside essential carbohydrates and vegetables. Crucially, we find no evidence of budget diversion into discretionary or temptation categories, such as alcohol or sweets.

These findings have significant implications for both business and public policy. For food retailers and marketers, the increased purchasing power allocation toward home preparation and fresh proteins signals a valuable opportunity to optimize assortment and promotional strategies in lower-income catchment areas. For policymakers, the results provide evidence that structured cash flow injections can yield positive changes in food spending patterns, enabling financially constrained populations to independently increase their purchases of fresh grocery inputs without the need for strict paternalistic consumption controls.

While this study utilizes robust cross-sectional data, future research could explore long term tracking to determine if these spending shifts persist over time or normalize as the novelty of expanded purchasing power diminishes. Furthermore, because our methodology captures retail grocery expenditures rather than actual physiological consumption, subsequent studies employing direct nutritional assessments or precise caloric intake tracking are needed to definitively evaluate the dietary health impacts of such financial interventions. Additionally, expanding this framework to investigate non-

food categories would provide a more holistic understanding of consumer behavior under relaxed financial constraints.

### References

- Baker, S. R., Farrokhnia, A., Meyer, S., Pagel, M., & Yannelis, C. (2023). Income, Liquidity, and the Consumption Response to the 2020 Economic Stimulus Payments. *Review of Finance*, 27(6), 2271–2304. <https://doi.org/10.1093/rof/rfad010>
- Banerjee, A. V., & Duflo, E. (2019). *Good economics for hard times*. Allen Lane.
- Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., & Schmidt, T. (2019). The impact of cash transfers: A review of the evidence from low- and middle-income countries. *Journal of Social Policy*, 48(3), 569–594. <https://doi.org/10.1017/S0047279418000715>
- Cattaneo, M. D., Idrobo, N., & Titiunik, R. (2019). *A practical introduction to regression discontinuity designs: Foundations*. Cambridge University Press. <https://doi.org/10.1017/9781108684606>
- Cattaneo, M. D., Idrobo, N., & Titiunik, R. (2024). *A practical introduction to regression discontinuity designs: Extensions*. Cambridge University Press. <https://doi.org/10.1017/9781009441896>
- Habimana, D., Houghton, J., Nkurunziza, J., & Houghton, D. M. (2021). Measuring the impact of unconditional cash transfers on consumption and poverty in Rwanda. *World Development Perspectives*, 23, 100341, 1–14. <https://doi.org/10.1016/j.wdp.2021.100341>
- Hoddinott, J., & Skufias, E. (2004). The impact of PROGRESA on food consumption. *Economic Development and Cultural Change*, 53(1), 37–61. <https://doi.org/10.1086/423252>
- Lee, D. S., & Lemieux, T. (2010). Regression discontinuity designs in Economics. *Journal of Economic Literature*, 48(2), 281–355. <https://doi.org/10.1257/jel.48.2.281>
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>
- National Statistical Office. (2023). *Executive summary of the 2023 household socio-economic survey*. Ministry of Digital Economy and Society.
- Poonpolkul, P., Kongphalee, T., & Tawichsri, T. (2024). บัตรคนจน ตอนที่ 1: บัตรคนจนคัดกรอง “คนจน” ได้แค่ไหน? (aBRIDGED No. 14/2024). Puey Ungphakorn Institute for Economic Research. <https://www.pier.or.th/abridged/2024/14/>
- Vannavanit, W., & Takahashi, K. (2025). Effects of an unconditional cash transfer program during the pandemic: Empirical evidence from Thailand. *International Journal of Disaster Risk Reduction*, 121, Article 105409. <https://doi.org/10.1016/j.ijdr.2025.105409>
- Woo, S., Moon, H., Aum, S., Soohyung, L., & Dohyung, K. (2022). Consumption Response to Seoul's COVID-19 Shopping Coupons: Evidence from Consumer Data. *The Korean Economic Review*, 38(2), 231–250.

Appendix

Table A1 Robust Density Test Results.  
Null Hypothesis: No density discontinuity at the 100,000 Baht threshold.

| Statistic                      | Value  |
|--------------------------------|--------|
| Robust Test Statistic (T)      | -1.631 |
| Robust P-value                 | 0.103  |
| Effective Observations (Left)  | 2,007  |
| Effective Observations (Right) | 2,564  |
| Bandwidth (Left)               | 14,328 |
| Bandwidth (Right)              | 10,981 |

Table A2 Robustness Checks for Raw Ingredients, Log Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 0.324***    | (0.075)    | 10,277         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 0.349***    | (0.050)    | 10,277         |
| Order = 3 (Cubic)                 | 0.386***    | (0.101)    | 10,277         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 0.312***    | (0.073)    | 10,277         |
| Uniform Kernel                    | 0.265***    | (0.070)    | 10,277         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 0.345***    | (0.108)    | 5,957          |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table A3 Robustness Checks for Raw Ingredients, Level Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 1640***     | (416)      | 11,292         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 2151***     | (283)      | 11,292         |
| Order = 3 (Cubic)                 | 1750***     | (539)      | 11,292         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 1618***     | (407)      | 11,292         |
| Uniform Kernel                    | 1720***     | (392)      | 11,292         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 1931***     | (563)      | 6,900          |

Table A4 Robustness Checks for Meat and Seafood, Log Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 0.88***     | (0.17)     | 10,858         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 0.91***     | (0.11)     | 10,858         |
| Order = 3 (Cubic)                 | 1.04***     | (0.22)     | 10,858         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 0.86***     | (0.17)     | 10,858         |
| Uniform Kernel                    | 0.83***     | (0.16)     | 10,858         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 0.99***     | (0.24)     | 6,697          |

**Table A5** Robustness Checks for Meat and Seafood, Level Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 918***      | (228)      | 9,884          |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 986***      | (154)      | 9,884          |
| Order = 3 (Cubic)                 | 965***      | (291)      | 9,884          |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 910***      | (222)      | 9,884          |
| Uniform Kernel                    | 893***      | (215)      | 9,884          |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 1097***     | (305)      | 5,832          |

**Table A6** Robustness Checks for Rice and Grains (Carbohydrates), Log Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 0.31***     | (0.09)     | 11,316         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 0.39***     | (0.06)     | 11,316         |
| Order = 3 (Cubic)                 | 0.36***     | (0.12)     | 11,316         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 0.30***     | (0.09)     | 11,316         |
| Uniform Kernel                    | 0.31***     | (0.08)     | 11,316         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 0.33***     | (0.12)     | 6,912          |

**Table A7** Robustness Checks for Rice and Grains (Carbohydrates), Level Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 351***      | (88.9)     | 12,111         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 399***      | (61.8)     | 12,111         |
| Order = 3 (Cubic)                 | 356***      | (113)      | 12,111         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 350***      | (87.3)     | 12,111         |
| Uniform Kernel                    | 494***      | (82.1)     | 12,111         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 376***      | (117)      | 7,106          |

**Table A8** Robustness Checks for Vegetables, Log Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 0.68***     | (0.15)     | 9,843          |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 0.72***     | (0.10)     | 9,843          |
| Order = 3 (Cubic)                 | 0.77***     | (0.20)     | 9,843          |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 0.66***     | (0.15)     | 9,843          |
| Uniform Kernel                    | 0.63***     | (0.14)     | 9,843          |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 0.79***     | (0.21)     | 5,817          |

**Table A9** Robustness Checks for Vegetables, Level Specification.

| Specification                     | RD Estimate | Std. Error | Effective Obs. |
|-----------------------------------|-------------|------------|----------------|
| Baseline Model                    |             |            |                |
| Local Poly = 2, Triangular Kernel | 259***      | (73.6)     | 12,291         |
| Alternative Polynomial Orders     |             |            |                |
| Order = 1 (Linear)                | 260***      | (50.1)     | 12,291         |
| Order = 3 (Cubic)                 | 228**       | (96.8)     | 12,291         |
| Alternative Kernels               |             |            |                |
| Epanechnikov Kernel               | 264***      | (71.7)     | 12,291         |
| Uniform Kernel                    | 355***      | (68.4)     | 12,291         |
| Alternative Bandwidth             |             |            |                |
| 50% of Optimal Bandwidth          | 294***      | (103)      | 7,18           |