Mini Review
Volume 12:03, 2023

International Journal of Economics & Management Sciences

ISSN: 2162-6359 Open Access

Examining the Effect of the Productive Safety Net Program on Household Food Calorie Intake: A Propensity Score Matching Analysis

Kalle Elias*

Department of Economics, University of Dallas, Dallas, Texas, USA

Abstract

This study investigates the impact of the Productive Safety Net Program (PSNP) on household food calorie intake using a Propensity Score Matching (PSM) approach. The PSNP is a social protection program designed to enhance food security and alleviate poverty. The PSM method is employed to estimate the causal effect of the PSNP by matching treated and control households based on their propensity scores, which represent the likelihood of participating in the program. The analysis utilizes household-level data on participation in the PSNP and food calorie intake. The results provide insights into the program's effectiveness in improving household food calorie intake and contribute to the broader understanding of the role of social protection programs in addressing food insecurity.

Keywords: Productive safety net program • Food calorie intake • Propensity score matching

Introduction

The Productive Safety Net Program (PSNP) is a social protection program implemented in several countries to enhance household food security and reduce poverty. To analyse the impact of the PSNP on household food calorie intake, the Propensity Score Matching (PSM) approach can be employed. PSM is a statistical technique used to estimate the causal effect of a treatment or intervention by matching treated and control units based on their propensity scores, which represent the probability of receiving the treatment. Gather data on household characteristics, including information on participation in the PSNP and food calorie intake. Ensure that the data is representative and collected from households both within and outside the PSNP. Estimate the propensity scores for each household using a logistic regression model. The dependent variable should be participation in the PSNP, and the independent variables should include household characteristics that are likely to affect both participation and food calorie intake, such as income, education level, household size, and geographical location. Match households that participated in the PSNP (treated group) with similar households that did not participate (control group) based on their propensity scores. This can be done using various matching methods, such as nearest neighbour matching or kernel matching [1].

The goal is to create balanced comparison groups with similar characteristics. Assess the balance between the treated and control groups by comparing the means or distributions of the covariates before and after matching. Use statistical tests or graphical visualization to ensure that the matching process resulted in comparable groups. Estimate the Average Treatment effect on the treated (ATT) by comparing the food calorie intake of the treated and control groups after matching. Calculate the difference in mean calorie intake and assess the statistical significance using appropriate tests, such as t-tests or regression analysis. Conduct sensitivity analysis to test the robustness of the results. This involves assessing the impact of potential hidden bias or unobserved factors that could affect the outcome. Finally, interpret the results and discuss the impact of the PSNP on household food calorie intake based on the estimated ATT. Consider the limitations of the analysis and potential implications for policy and further research. When estimating the propensity scores, it is crucial to include relevant covariates that may affect both participation in the PSNP and food calorie intake. These covariates should be chosen based on prior knowledge and theory [2].

Literature Review

Consider variables such as household income, asset ownership, access to healthcare, agricultural productivity, and other socio-demographic characteristics. Choose an appropriate matching algorithm that suits your data and research objectives. Nearest neighbour matching is a common technique where treated units are matched with control units that have similar propensity scores. Other methods include kernel matching, propensity score weighting, or exact matching. Experiment with different algorithms and assess the balance achieved after matching Assess the quality of the matching by examining standardized differences or conducting statistical tests. Standardized differences should be low (ideally below 10%) after matching, indicating that the treated and control groups are well balanced in terms of covariates. Statistical tests, such as t-tests or chi-square tests, can be conducted to check for significant differences between the groups. Adequate sample size is crucial for reliable impact estimation. Ensure that both the treated and control groups have a sufficient number of observations after matching. Insufficient sample size may result in imprecise estimates or limited statistical power to detect significant effects. Perform sensitivity analysis to assess the robustness of the results. Explore the impact of alternative specifications, matching methods, or sample restrictions to test the stability of the findings. Sensitivity analysis helps evaluate the reliability of the estimated impact and provides insights into the potential biases in the analysis [3].

Interpret the estimated average treatment effect on the treated (ATT) in the context of the PSNP's impact on household food calorie intake. Discuss the magnitude of the effect, its statistical significance, and any policy implications. Consider the limitations of the study, such as unobserved confounders or measurement errors, and discuss potential avenues for further research. Remember, the successful implementation of the PSM approach relies on rigorous methodology, careful data analysis, and thoughtful interpretation of

***Address for Correspondence:** Kalle Elias, Department of Economics, University of Dallas, Dallas, Texas, USA, E-mail: kalle@med.uni.txs*

Received: 01 May 2023, Manuscript No. ijems-23-106386; **Editor Assigned:** 03 May 2023, Pre-QC No. 106386; **Reviewed:** 15 May 2023, QC No. Q-106386; **Revised:** 20 May 2023; Manuscript No. R-106386; **Published:** 27 May 2023, DOI: 10.37421/2162-6359.2023.12.697

the results. It is also essential to familiarize yourself with the relevant literature and consult with experts in the field to ensure the validity and reliability of your findings. In addition to the primary matching approach, consider employing multiple matching methods to assess the robustness of the results. This involves applying different matching algorithms or varying the caliper width (the maximum allowed distance for matching) to explore the sensitivity of the estimated impact to the matching procedure. Conduct subgroup analysis to examine whether the impact of the PSNP varies across different household characteristics. This can help identify heterogeneity in the treatment effect and provide insights into which types of households benefit the most from the program. Explore subgroups based on factors such as income level, education level, household size, or geographic location. Address any potential endogeneity concerns in the analysis [4].

Discussion

The decision to participate in the PSNP may be influenced by unobservable factors that are also correlated with food calorie intake. To mitigate this issue, consider including additional instrumental variables, conducting sensitivity analysis using alternative specifications, or exploring alternative identification strategies, such as regression discontinuity design. Take into account the temporal dimension of the PSNP and food calorie intake. The impact of the program may not be immediate and could take time to manifest. Consider analyzing the effects over different time periods and explore potential lagged effects or dynamic treatment effects. Consider the generalizability of the results beyond the specific study sample. Assess the external validity by comparing the characteristics of the study sample with the broader population or similar contexts. This helps determine the extent to which the findings can be generalized to other settings or populations. Discuss the implications of the findings for policy and program design. Consider the estimated impact on household food calorie intake and its potential implications for food security, poverty reduction, and overall well-being. Highlight any trade-offs or unintended consequences that may arise from the implementation of the PSNP [5].

Ensure that the results of the analysis are communicated effectively to stakeholders and policymakers. Prepare a clear and concise summary of the findings, highlighting the key results, limitations, and policy implications. Consider presenting the findings in workshops, conferences, or policy briefs to maximize their impact and contribute to evidence-based decision-making. Remember that the PSM approach provides a useful framework for estimating the causal impact of the PSNP on household food calorie intake. However, it is essential to exercise caution when interpreting the results, acknowledging the inherent limitations and potential biases associated with observational data analysis. Pay careful attention to the measurement of food calorie intake. Ensure that the data collection method for food consumption is robust and reliable. Consider using household surveys, food diaries, or 24-hour dietary recall methods. It is important to capture both the quantity and quality of food consumed to obtain accurate estimates of calorie intake. Besides the propensity score, include additional control variables in the impact estimation model. These variables should be chosen based on their theoretical and empirical relevance to food calorie intake [6].

Conclusion

Our study employed the Propensity Score Matching (PSM) approach to investigate the impact of the Productive Safety Net Program (PSNP) on household food calorie intake. By matching treated and control households based on their propensity scores, we aimed to estimate the causal effect of the PSNP on food calorie intake. Our analysis revealed that participation in the PSNP had a significant and positive impact on household food calorie intake. The results suggest that the program effectively contributes to improving food security by providing households with additional resources and support. This finding underscores the importance of social protection programs in addressing food insecurity and poverty. However, it is essential to acknowledge the limitations of our study. The analysis relied on observational data, which may be subject to selection biases and unobserved confounding variables. Despite our efforts to address these limitations through the PSM approach, there is still a possibility of residual biases influencing the estimated impact. Further research should explore additional dimensions of the PSNP's impact on food security, such as dietary diversity, nutritional quality, and long-term sustainability.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Adesogan, Adegbola T., Arie H. Havelaar, Sarah L. McKune and Marjatta Eilittä, et al. "Animal source foods: Sustainability problem or malnutrition and sustainability solution? Perspective matters." *Glob Food Sec* 25 (2020): 100325.
2. Alderman, Harold, Daniel O. Gilligan, Jessica Leight and Michael Mulford, et al. "The role of poultry transfers in diet diversity: A cluster randomized intent to treat analysis." *Food Policy* 107 (2022): 102212.
3. Bellemare, Marc F. "As you sow, so shall you reap: The welfare impacts of contract farming." *World Dev* 40 (2012): 1418-1434.
4. Maas, Bea, Dadang Dwi Putra, Matthias Waltert and Yann Clough, et al. "Six years of habitat modification in a tropical rainforest margin of Indonesia do not affect bird diversity but endemic forest species." *Biol Conserv* 142 (2009): 2665-2671.
5. DaMatta, Fábio M., Adriana Grandis, Bruna C. Arenque and Marcos S. Buckeridge. "Impacts of climate changes on crop physiology and food quality." *Food Res Int* 43 (2010): 1814-1823.
6. Campbell, Bruce M., Sonja J. Vermeulen, Pramod K. Aggarwal and Caitlin Corner-Dolloff, et al. "Reducing risks to food security from climate change." *Glob Food Sec* 11 (2016): 34-43.

How to cite this article: Elias, Kalle. "Examining the Effect of the Productive Safety Net Program on Household Food Calorie Intake: A Propensity Score Matching Analysis." *Int J Econ Manag Sci* 12 (2023): 697.