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The impact of the Hope Growing Account Program on participants' household earned income in Korea

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INTRODUCTION

This longitudinal panel study aims to estimate the impact of the Hope Growing Account (Hope) program on program participants' household earned income in South Korea ('Korea'). Briefly, the Hope program is a nationwide matched savings program introduced in 2010 by the Korean government to assist working poor households to exit poverty through accumulating assets (Choi, Han, & Choi, 2012). In essence, the Hope program is aimed at the working poor whose household income is below the absolute poverty line (i.e., national minimum living expense) in Korea. The participants in the Hope program identify a savings goal, such as education expenses, housing fees, or opening a small business, and make regular deposits into a designated account. Individuals' contributions to the account are matched at 1:1 rates by public resources. In addition, a monthly earned income grant is offered from public resources. Three years after commencing the program, participants are allowed to withdraw the accumulated assets from their bank accounts in order to use them for the intended savings goal.

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Although the matched savings program primarily aims to promote saving and asset accumulation for low-income households, many stakeholders are also interested in the impact of the Hope program on the participants' household earned income. Empirical study suggests that most Hope program participants significantly increased their earned income in order to save regularly (Choi, Han, & Choi, 2012). However, this empirical finding is likely to be biased in the absence of a control group. This study addresses the limitations of previous research by testing how household monthly earned income varies between Hope program participants and non-participants. We posit the following research question to guide the study: To what extent is the Hope Growing Account program increasing participants' household monthly earned income? We hypothesize that Hope program participants, compared to non-participants, had significantly higher household earned income two years after beginning the program.

🔍 METHODS

Data resources

In this study, longitudinal data on the Hope program participants came from the Hope Growing Account panel study by Choi, Han, and Choi. (2011). We used 1,308 households commencing the Hope program in May and June of 2010. Moreover, we gathered information about participants' household monthly earned income from the monthly reports issued by the bank managing Hope program savings account in May and June of 2010 and June of 2012. To compare the change in household monthly earned income between participants and non-participants, we created the non-participants group using the Korean Welfare Panel Study (KOWEPS) in 2010 and 2012. We restricted the sample to 185 households who had the same income level as Hope program participants, but did not participate in the Hope program. To remove the imbalance of observed covariates between the treatment and non-treatment groups drawn from two different data resources, we used Propensity Score Matching (PSM).

Variables

We assigned household monthly earned income variation between 2010 (i.e., baseline) and 2012 (i.e., two years later) as the dependent variable. For calculating the propensity score, we chose 10 socio-demographic characteristics of household and household heads as conditioning variables: family composition (the number of members and the number of workers), region, baseline earned income, gender, marital status, age, education, health status, and employment.

Analysis plan

First, we used descriptive statistics to examine the key socio-economic characteristics of the Hope program participants. Then, we implemented PSM and difference-in-differences (DID) analysis to estimate the variation between treatment and non-treatment group household monthly earned income between 2010 and 2012. Due to the small sample size of the non-treatment group, we employed the local linear matching algorithm which enables one-to-many matching by calculating the weighted average of the outcome variable for all non-treated cases. The difference between the outcome of the treated case and the weighted average of the outcomes for all non-treated cases yields an estimate of the treatment effects for the treated group (Guo, Barth, & Gibbons, 2006). Bootstrapping was used to determine statistical significance of the outcome. Finally, we tested the sensitivity of findings (i.e., changes in earned income) to different specifications of bandwidth (i.e., determining the number of observations falling into the span) and trimming (i.e., discarding nonparametric regression results in regions where the propensity scores for the non-treated cases were sparse). All statistical analyses were conducted using Stata version 13.

🔍 RESULTS

Comparison between treatment and non-treatment groups

Table 1 presents sample descriptive statistics and logistic regression models for estimating the propensity score. Here, the propensity score is defined as the conditional probability of participating in the Hope program given conditioning variables. In this analysis, only the 1,066 households who had stayed in the Hope program for two years were considered, and after excluding the cases missing the propensity score, 1,045 households were analysed. Thus, we analysed 1,230 total households: 1,045 Hope program participants in 2010 and 185 non-participants.

Table 1. Sample description and logistic regression model predicting propensity scores

Variable	N	% Non treated	% Treated	Bivariate test (T-test, χ^2 test)	Logistic
The number of family members M (SD)	1230	2.08 (.071)	3.23 (.034)	-14.564***	1.222
The number of workers M (SD)	1230	1.07 (.051)	1.3 (.020)	- 4.265***	1.852**
Monthly earned income_2010 M (SD)	1230	75.45 (1.87)	102.19 (.81)	- 13.106***	1.017
Age M (SD)	1230	64.38 (.93)	45.29 (.207)	20.034***	.843***
Gender					
Female	753	9.8	90.2	41.298***	
Male	477	23.3	76.7		
Education					
Less than high school	456	29.6	70.4	115.545***	
High school or equivalent	584	6.3	93.7		.8057
B.A. or higher	168	7.7	92.3		1.379
Marital status					
Married	398	23.9	76.1	37.912***	
Divorced/separated/widowed	738	10.3	89.7		3.389***
Never married	70	20.0	80.0		.391*
Self-rated physical health					
Poor	368	15.0	85.0	15.3325	
Fair	320	21.6	78.4		.351***
Good	526	11.6	88.4		.330***
Job					
Employer	143	46.9	53.1		1.262
Temporary worker	654	8.3	91.7		6.171***
Regular worker	309	1.6	98.4		17.095***
Region					
Seoul	122	13.9	86.1	.370	
Incheon/Gyonggi	295	12.5	87.5		1.558
Busan/Gyeongnam	203	12.8	87.2		1.418
Daegu/Gyeongbuk	173	16.8	83.2		1.014
Daejun/Chungnam	97	18.6	81.4		1.620
Kangwon/Chungbuk	73	21.9	78.1		2.005
Gwangju/Jeolla/Jeju	267	15.7	84.3		1.097

  *$p<.01$
 **$p<.05$
***$p<.001$

Findings from bivariate tests (chi-square for the categorical variables and t-tests for the continuous variables) show that most covariates except the region were significantly different under $p<.001$ before matching. This indicates that the covariate distributions for the treated and non-treated subjects did not overlap sufficiently in the two samples.

Table 2. Estimated average treatment effects on income change: difference-in-differences estimation by local linear regression

Group and comparison	Outcome measures: Differences in monthly earned income between 2010 and 2012y (US$)
Mean difference between 2010y and 2012y	
Households who participated in Hope program (n=1,045)	54.08
Households who did not participated in Hope program (n=185)	-99.88
Unadjusted mean difference	153.96*
Adjusted mean difference	
DID point estimate (bias corrected 95% confidence interval)	167.75* (2.27, 52.42)
Sensitivity analyses	
DID point estimate (bias corrected 95% confidence interval)	
Changing bandwidth	
Small-bandwidth=0.01	154.99 (-2.16, 70.53)
Small-bandwidth=0.05	165.92 (-1.02, 52.38)
Large-bandwidth=0.8	55.48 (-8.19, 23.86)
Trimming	
2% (2 cases excluded)	166.26* (3.90, 52.18)
5% (5cases excluded)	167.31* (5.15, 52.34)
10% (11cases excluded)	166.35* (4.44, 52.30)

Note: [a] Difference-in-differences; * The 95% confidence interval does not include a zero, or $p<.05$ for a two-tailed test

Table 2 presents results from DID estimation by local linear regression for the estimated average treatment effect on income change. The mean household monthly income for the treatment group increased by $54.08, while that for the non-treatment group decreased by $99.86 between 2010 and 2012. The unadjusted mean difference between the two groups was $153.95, meaning that the average change in monthly earned income for the treatment group was $153.95 higher than that for the non-treatment group. DID estimation further adjusted for heterogeneity in program participation by taking into consideration the distance of propensity scores between a treated case and its non-treated matches in calculation of the treatment effect for the treated. The point estimate of the DID on the monthly earned income was $167.75. It was statistically significant with 95% confidence interval. This result shows that Hope program participation generated an increase in household monthly earned income for low-income households. Sensitivity analyses of different bandwidth specifications and different trimming strategies showed different results. While DID estimates were statistically significant with different bandwidths, they were not when applying the three different trimming schedules (2%, 5% and 10%) with the bandwidth fixed at the default level.

CONCLUSION

This study illustrates the augmentation of Hope program participants' household monthly earned income in Korea. We found that the average changes of the households' monthly household earned income for the Hope program participants was $167.75 higher (or better) than that for the non-participants. Although PSM and DID estimation offer a strong evidentiary base to correct for selection bias, the results from sensitivity analysis reveal that the average treatment effect estimates may still be prone to omission of important heterogeneity affecting treatment assignment. For interventions, we suggest complimentary case management to target other non-income aspects of social development. Further, there is an opportunity to combine elements of the Hope program with active labour market policies, such as the Employment Success Package program and the Korean equivalent of the Earned Income Tax Credit (EITC).

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🔍 RÉSUMÉ EXÉCUTIF

En Corée, le nombre de travailleurs pauvres a augmenté depuis la crise financière asiatique de 1997, et a continué d'augmenter depuis la crise financière mondiale de 2008 (Noh, 2013). Malgré une certaine fluctuation depuis la fin des années 1990, le taux de pauvreté relative des personnes actuellement employées (pourcentage de personnes qui gagnent moins de 50 % du revenu médian d'un ménage ordinaire après impôt et transferts) est passé de 9,5 % à 11,1 % entre 1999 et 2011. En outre, le nombre de personnes en âge de travailler (18-65 ans) qui se sont retrouvées dans la catégorie de la pauvreté relative a été estimé à 2,92 millions, soit 7,3 % de l'ensemble de la population coréenne (Noh, 2013).

En 2010, le gouvernement coréen a mis sur pied le programme Hope Growing Account (Hope), qui combine une allocation de revenu mensuel et une somme égale destinée à l'épargne afin d'encourager les travailleurs pauvres à constituer des actifs. Les participants au programme Hope déterminent un objectif d'épargne, comme les frais de scolarité, les frais de logement, ou la création d'une petite entreprise et font des dépôts réguliers dans un compte désigné. Les contributions des particuliers au compte sont égalées selon un ratio 1:1 par des ressources publiques. De plus, une allocation de revenu mensuel est offerte et provient de ressources publiques. Trois ans après le début du programme, les participants sont autorisés à retirer les actifs accumulés de leur compte bancaire afin de les utiliser pour l'objectif d'épargne déterminé.

La présente étude longitudinale a estimé l'augmentation des revenus gagnés par 1045 ménages à faible revenu. L'estimation effectuée en utilisant la méthode de la différence des différences montre que le changement moyen relatif au revenu mensuel des ménages participants était de 167,75 $ plus élevé que celui des non-participants entre 2010 et 2012. La différence était statistiquement significative avec un coefficient de confiance de 95 %. Nos résultats indiquent que le programme Hope peut favoriser l'augmentation du revenu gagné des ménages composés de travailleurs pauvres en Corée.