Making TUPAD Happen: An Impact Evaluation Study on Tulong Pangkabuhayan sa Ating Disadvantaged Workers Program

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Abstract: In 2009, the Department of Labor and Employment (DOLE) introduced TUPAD or Tulong Panghanapbuhay sa Ating Disadvantaged Workers, an emergency employment program under DOLE's main livelihood and welfare program. TUPAD seeks to provide assistance to displaced workers, underemployed, and unemployed poor through a cash-for-work scheme. This study assessed and evaluated the impact of TUPAD to its beneficiaries by utilizing the DLSU-AKI Community-Based Monitoring (CBMS) data from 2016-2017. This impact evaluation aimed to reinforce and solidify the TUPAD program in order to bring forth welfare-based strategic directions that will make decent living standards happen. Thereby, econometric methods such as probit regression and propensity score matching (PSM) were performed to determine objectives of interest. Probit regression showed that TUPAD has significant optimistic effects on education and labor force by establishing positive statistical relationships. For every increase in the non-continuance of education, there is a 0.820 increase in TUPAD program participation. Similarly, labor force has the same variable situation with education. Thus, for every unit increase in the non-participation on labor, there is 0.032 unit increase in the program participation. Correspondingly, PSM proved that TUPAD can increase its annual average income by about 18%. The impact evaluation of TUPAD program proved the gradual improvement of the living standards of a household through the additional interim income stream from the provided or available work set by program administrators. Still, it is important to acknowledge that education plays a vital role in somehow avoiding the effects brought about by any adverse economic circumstances.

Key Words: impact evaluation; probit regression; propensity score matching; TUPAD

1. INTRODUCTION

The Philippines, as an emerging economy, has always been striving for stability and sustainability especially in the human capital and employment sector. However, the Philippines has always been a vulnerable country to both socio-economic crises and natural disasters, affecting the livelihood conditions of millions of Filipinos. In 2009,

DOLE concluded that four out of every 10 workers in the Philippines were deemed vulnerable as supported by their statistical result regarding employment rate amounting to 42.6 percent. Accordingly, during the downswing years of 2000-2009, the conjointly declining GDP growth rate and the rising unemployment rate and population. Henceforth, due to the repercussions of economic crises and the rapid growth in population, job generation slowed down significantly (Urrutia et al., 2017). Moreover, almost

every year, natural disasters are the major contributors to regional economic decline leading to the displacement of workers. In light of the country's economic behavior towards the employment growth, the Philippine government started zeroing in on the provision of social protection, and inequality and poverty reduction through Department of Labor and Employment (DOLE). The government's initiative on alleviating the risks of the ramifications has resulted into commencing DOLE Integrated Livelihood and Emergency Employment Program (DILEEP) in 2009—a program with a principal objective of livelihood restoration through immediate assistance to unemployed, underemployed, disadvantaged, and displaced workers.

Tulong Panghanapbuhay sa Ating Disadvantaged Workers or TUPAD is a program initiated and implemented by DOLE. TUPAD is a community-based program that provides assistance package for displaced workers, underemployed, and unemployed poor through a cash-for-work scheme. Initially, program offers emergency employment from various projects for a period of 10-30 days. However, due to the reformation of special provisions under the 2019 General Appropriations Act, the program period was changed to 10-90 days. Projects include social, economic, and agro-forestry projects. In addition, DOLE provides TUPAD enrollees of the following benefits: basic orientation regarding health and safety, personal protective equipment, micro-insurance enrolment, and TUPAD ID. Beneficiaries would be paid 100% of the current minimum wage in the private sector as per time records. Ultimately, TESDA provides free accessibility to the agency's trainings in order to gear up the beneficiaries towards self- and wage employment. (DOLE, 2014)

TUPAD primarily aims to improve the current situation of the disadvantaged workers through cash-for-work which consequently translates to an improvement in the essential expenditures of the beneficiaries. As such, this study assessed one of the main objectives of TUPAD which is the additional interim income stream. Correspondingly, it answered the question "What positive impact does TUPAD have on the annual income of its beneficiaries?" Its evaluation was obtained by utilizing secondary data from the DLSU-AKI Community-Based Monitoring System (CBMS) data. However, due to the paucity of the available data, evaluation is limited to a 1-year period from 2017-2018 and variables such as total expenditure will be regarded as whole all throughout due to the lack of component breakdown in the dataset. The impact evaluation of this study applies theory of change backed with hypothesis towards outcome of interest. Moreover, this study then extends policy recommendations upon the evaluation results to strengthen and expand the program. Correspondingly, this study offers persistent perspective on government's social protection programs to Economics students and researchers, and this study can be valuable to DOLE as the results and policy recommendations may be a tool into reforming a more effective, equitable social protection policy strategy.

2. METHODOLOGY

2.1 Results Chain

Over the years of strengthening social protection, governments of developing countries had veered away from commodity-based assistance and replaced it with cash-based assistance through several transfer modalities. Theoretically, cash-based assistance is preferable to commodity-based as it is deemed to be more economically efficient (Tabor, 2002). Moreover, considering that certain assumptions hold, cash-based assistance gives the beneficiaries the freedom of choice to manage their household expenditures covering all necessities, especially human capital investments. Thus, the beneficiaries acquire a higher level of satisfaction with cash-based assistance than the case with commodity-based (Hanlon et al., 2010). In response, the Philippine government appointed DOLE for the implementation of DILEEP in order to alleviate poverty caused by environmental, socioeconomic shocks through cash transfers and cash-for-work schemes.

TUPAD operates on cash-for-work scheme that enables disadvantaged workers to continue investing in human capital development pursuits for the stability of their household. Further, the emergency employment by TUPAD helps the beneficiaries in terms of labor force by filling in the gaps caused by unavailability and loss of work. TUPAD hypothesizes that the emergency employment capacitates the beneficiaries to increase and improve their household expenditures for the meantime. Correspondingly, Figure 1 shows the results chain in which TUPAD has the following theory of change:
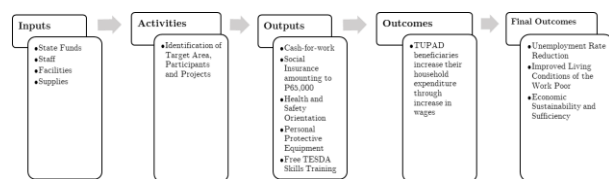
Fig. 1. Results Chain

2.2 Evaluation Design

This study utilizes a matching design, particularly propensity score matching (PSM), to determine the impact of the TUPAD intervention to the income of the participants. Generally, PSM is a suitable method to compare the income of the TUPAD participants with their counterfactual group that did not avail the program. Moreover, this method is considered to be the most pragmatic strategy in identifying the impacts of the program of interest given the circumstances of data availability. The evaluation design will be dependent of the secondary data available. Hence, no firsthand tasks or activities were conducted in order to gather data for the intervention. The evaluation process design in determining the impacts of TUPAD are as follows: (1) identifying the source data, (2) estimation procedure or empirical approach, (3) defining the variables, and (4) running the program that would cater the PSM.

2.3 Data Source

In this study, the data utilized was obtained from DLSU-AKI which dated in 2016-2017. The data is gathered through Community-Based Monitoring System (CBMS), a diagnostic tool for assessment of the poverty in various levels such as barangay, municipal, city, and provincial. The data includes demographics of the community, programs they enrolled into, or they are aware of, and all of the necessary information that may be used for planning, program implementation, and impact monitoring to whichever level it is needed.

The CBMS survey was conducted in 2016-2017 among poor and non-poor in selected barangays in the following municipalities: City of Manila, City of Marikina, Lipa Batangas, Dasmarinas Cavite, Ozamiz Misamis Occidental, and Bago Negros Occidental. The study focused on the poor both

beneficiaries and non-beneficiaries of the TUPAD program.

2.4 Estimation Procedure and Model Specification

The comparison of the outcomes in households with one TUPAD participant and households with matched characteristics and presumed outcomes but not a TUPAD participant is a valid measurement of the impact of TUPAD. With this, the assessment of the impact can be governed by the concept that any intervention that requires assessing shall be inferred through outcomes of both participants and non-participants. Accordingly, this concept can be translated into an empirical form as various studies such as Heckman et. al (1997) and Smith & Todd (2001) asserted that in this conversion Y_1 is the mean of conditional outcome regarding participation, which is on the treatment group, while is the mean of conditional outcome regarding non-participation which brought about by the control group. Thus, accounting for both aforementioned parameters shall present a change in the mean outcome that concludes the impact of participation in the program.

In this study, the change in the mean outcome of both participants and non-participants shall conclude the impacts of the TUPAD intervention in income. The empirical form is given by:

$$\Delta Y = Y_1 - Y_0 \qquad (1)$$

Propensity score matching (PSM) as the main econometric method further examines the abovementioned change in the mean outcome and this method has the prediction of its propensity scores is dependent on either a probit or logit model. In this study, it is based on a multivariate regression approach in terms of probit. The model is shown below:

$$eeptupadind = \beta_0 + \beta_1 age_{yr} + \beta_2 emplyd_{yrs} \\ + \beta_3 educind + \beta_4 labfor + \beta_5 rhsize + \varepsilon \qquad (2)$$

Correspondingly, the predicted scores of the propensity matching are utilized for the measurement of the treatment effect. Comprehensively, the treatment effect in this study is the average treatment effect on the treated (ATT) as it is a widely known parameter of interest when an analysis regarding

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PSM is conducted (Becker & Ichino, 2002). The ATT in this study shall be used to assess the effects of participation on the TUPAD intervention. ATT is calculated through matching participants and non-participants with the closest propensity scores. Moreover, radius matching technique, as embedded in the statistical software package, shall be employed for the advantage of comparing the available units within the radius that allows the usage of extra units when there is no availability of good matches. Ultimately, the verification of the robustness of the PSM is realized using Stata's *sensatt* program, a sensitivity analysis specializing on PSM variables.

2.5 Data Specification

Data used in this study is gathered from DLSU-AKI CBMS 2016-2017. The variables utilized are as follows: (1) participation in TUPAD, (2) age, (3) years of employment, (4) labor force, and (5) household size. In order to identify the impact of the TUPAD program, enrollees of the program should be determined as well as the non-enrollees. Hence, the program participation variable.

Age defines the range of required age for the TUPAD program. Age is an important variable because it determines the viability of a worker to legally participate in the workforce. Years of Employment denotes the years rendered by an employee from its starting period until 2018. This variable is necessary to determine the impact of TUPAD because it provides the level of expertise of a worker so as to land an appropriate job in the emergency employment program. Education defines the worker's educational level so as if they continued into college or not. This variable is as important as years of employment as well because it provides the educational attainment of a worker so as to land an appropriate job in the emergency employment program. Labor force categorizes the worker into two sections such as when (1) worker is actively looking for a job or currently working, or (2) no work at all. Lastly, household size denotes the number of family members included in the worker's current household.

Table 1. Data Specification

Variable	Type/ Designation	Measurement
Availed TUPAD	Dependent / *eetupadind*	1 if Yes-participants of TUPAD, 0 otherwise

Age	Independent / *age_yr*	Age of the worker in years
Years of Employment	Independent / *emplyd_yrs*	Years of employment in numbers
Education	Independent / *educind*	1 if education was continued to college, 0 otherwise
Labor Force	Independent / *labfor*	1 if actively looking for a job/currently employed, 0 otherwise
Household Size	Independent / *rhsize*	Size of the household in numbers

3. RESULTS AND DISCUSSION

3.1 Summary Statistics

As shown in Table 2, there are 5,791 observations for the Availed TUPAD variable, and it has a mean of 0.0223 or 2.23% in terms of the participant's portion. It is defined by 1 and 0 which represents the people who are program participants and who are not, respectively. For age, there are 36,030 observations with an average age of ~37 years old. As such, the minimum and maximum age are 18 and 65, respectively. Years in employment has 26,016 observations which presented a minimum of 0 to a maximum of 45 years of work experience. The mean year of employment is 0.9486 or ~1 year. With 35,376 observations, education accounted for a mean value of 0.0706 or 7.06% in terms of the people who continued their education into college. Labor force and household size has the same size of observations with age—36,030. Labor force participation has an average value of 0.4874 or 48.47% of the population are actively seeking for a job or currently working. Lastly, for the household size, the mean value is 5.3037 or ~6 members of the household from the minimum number of 1 to a maximum of 19 members.

Table 2. Summary Statistics

Variable	Obs.	Mean	SD	Min.	Max.
eeptupadind	5,791	0.0222	0.1475	0	1
age_yr	36,030	37.2467	13.1081	18	65
emplyd_yrs	26,016	0.9486	4.1530	0	45
educind	35,376	0.0706	0.2561	0	1
labfor	36,030	0.4874	0.4998	0	1
rhsize	36,030	5.3037	2.1029	1	19

3.2 Probit Regression

Prior to executing PSM is the probit regression analysis. The variables of interest in this study undergone multivariate probit regression as depicted in Table 3.

First, the results of age have exhibited a significant positive relationship with the program participation. The coefficient of regression shows that for every unit increase in age, there is a 0.005 unit increase in the participation in TUPAD. These results indicate that age affects the TUPAD in a very minimal manner but in certain sense, increase in age indicates higher responsibility so with the consequences of socioeconomic crises or natural disasters, age can play a role, but again, in a very minimal manner. Years of employment's results depict that for every unit increase in work experience, participation in TUPAD decreases by 0.010. This means they have a statistically negative relationship. As such, for every worker who gains work experience by months, or by years, the less likely it is going to avail the program since it may secure them a job that may not be strongly affected by displacement or recession. As for education, it shows a statistically positive relationship with program participation. For every increase in the non-continuance of education, there is a 0.820 increase in the program participation. Moreover, it is important to note that in this variable, the non-continuance was accounted rather than otherwise. Hence, the result. This denotes that when participants refrain from pursuing college education, after the occurrence of natural disasters or socioeconomic crises, they are more likely to avail TUPAD program due to displacements or a possible recession. Labor force establishes a positive statistical relationship with program participation. Similarly, labor force has

the same variable situation with education. Thus, for every unit increase in the non-participation on labor, there is 0.032 unit increase in the program participation. This result is straightforward as it indicates that if the population is not working or not connected into any compensating work, they have a higher probability of availing TUPAD while seeking or waiting for job opportunities. Lastly, the household size exhibits a statistically positive relationship with the program participation. For every unit increase in the household size, there is a 0.033 unit increase in the program participation as well. This may describe that when the family or the members in the household is getting bigger, the more likely that one of them would avail the TUPAD program to suffice their needs.

Table 3. Multivariate Probit Regression

Variable	(1) Multivariate Probit Regression
Age	0.005**
	(0.003)
Years of Employment	-0.010***
	(0.003)
Education	0.820***
	(0.163)
Labor Force	0.032**
	(0.087)
Household Size	0.033***
	(0.017)
Observations	5690
Pseudo R-square	0.032**

Note: Standard errors in parantheses.
Statistical significance at 1%, 5%, and 10% are indicated by *** p<0.01, ** p<0.05, * p<0.1.

3.3 Propensity Score Matching

Succeeding the multivariate probit regression analysis, PSM was accomplished. In this method, total income of the households is the key outcome indicator. Moreover, there is a total of 126 in the treated group and 5,564 in the controls group. The two groups were determined by manual data analysis in which the common characteristics: (a) poor and (b) average annual income were factored in. Poor is classified within the range of minimum wage earners to unemployed while average annual income is based on the 2018 minimum wage which is Php475.00. Thus, accounting for the results of the prior regression analysis and incorporating the total income, ATT revealed that once a person participated in the TUPAD program, their mean outcome in terms of total

income is 25,942.9994. Correspondingly, with the T-stat of 3.16, a value higher than 2.0, this means that there is an actual impact from TUPAD to the participants' income. Therefore, this denotes that availing the TUPAD program can add Php 25,942.9994 to their annual average income of Php 140254.126. Comprehensively, the mean outcome from the ATT can be divided into the 30 to 60 day work program set by the TUPAD administrators while accounting for the current minimum wage. Additionally, the PSM results are visualized in Figure 2. The red-dashed curve represents the controls group, while the blue solid curve represents the treated group. The graphical representation illustrates the impact of TUPAD on the total income of the participants.

Table 4. PSM Results

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Total	Unmatched	140254.126	118478.305	21775.8211	5979.18247	3.64
Income	ATT	140254.126	114311.127	25942.9994	8217.4599	3.16

Note: S.E. does not take into account that the propensity score is estimated.
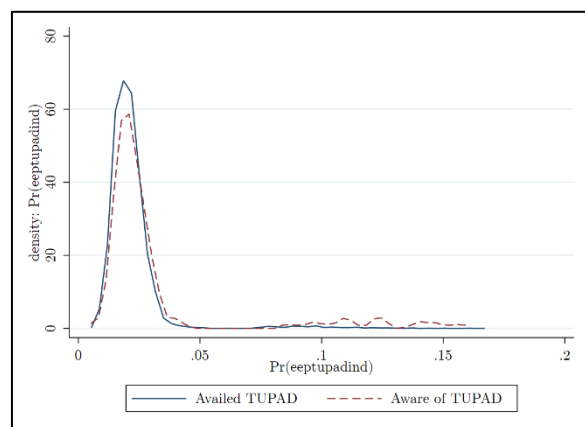

Fig. 2. K-density Graph of PSM

The sensitivity analysis—Stata's *sensatt*—conducted for PSM has resulted into a favorable outcome. *Sensatt* can prove the robustness of the PSM through t-value. T-value must be higher than 2 to support the claims of robustness of the study. As depicted in Table 5, the t-value is 2.852 under 5,690 observations. Only *educind* was examined against *eeptupadind* as *sensatt* can substantiate its results even when working only with one (1) independent variable and one (1) dependent variable. In

conclusion, the PSM—as supported by sensitivity analysis—is robust.

Table 5. Sensitivity Analysis (*sensatt*) Results

No. of Treatment	No. of Controlled	ATT	Standard Error	t-value
126	5,564	0.041	0.014	2.852

4. CONCLUSIONS

In a country where there is an apparent vulnerability on socioeconomic crises and natural disasters, it is imperative to implement emergency employment programs to keep the economy afloat. These kind of programs backs the interim financial needs of households while the job market is reviving. Correspondingly, this study evaluates the impact of TUPAD, an emergency employment program launched by the government with the goal of providing temporary jobs to people who are displaced, disadvantaged, or work poor. As to determining the impact of TUPAD, total income was established as its key outcome indicator. The impact of TUPAD on total income was analyzed through propensity score matching, a method that identifies the intervention's causal impact through matching characteristics of the participants and the population who are observed to be non-participants even when the program took place in apparent. With this, it is necessary to know that one of the caveats of the evaluation design is the inability to fully capture detailed explanations of the behavior and changes occurred during the program. However, the results were comprehensive and conclusive as to defining the impacts of TUPAD intervention.

TUPAD program significantly improves the living standards of a household through the additional interim income stream from the provided or available work set by program administrators. Nevertheless, it is important to recognize that education remains the solid contributor in somehow avoiding the effects brought about by any adverse circumstances. Had the government encourage—not just provide free schooling—the people to finish their degrees through effective policy on education, displacements and disadvantages on work can be minimized. Consequently, the size of household may be a factor as

to why one cannot fully satisfy its financial obligations. Economically, placing sex education and family planning into taboo still deters the household to set their mindset on examining their capabilities and opportunities against their responsibilities before resulting into a large family. Once the aforementioned were established, the rendered work experience can provide a reliable backing which subsequently translates into reduction of job displacements because there is enough year of service that can prove expertise.

In the last quarter of 2021, the Philippine government targets to increase the 2022 funding of TUPAD program by Php 12 billion to aid the beneficiaries. However, at the end of the day, indicators and interventions are just signposts of change.

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