The Marginal Benefit Of An Active Labor Market Program Relative To A Public Works Program: Evidence From Papua New Guinea

Christopher Hoy[1]

Darian Naidoo[2]

Draft (February 2019)

Abstract. Policymakers typically try to address youth unemployment in developing countries through either Active Labor Market Programs (ALMPs) or Labor Intensive Public Works Programs (LIPWs). We examine whether there is any additional benefit for unemployed youth from participating in a comprehensive ALMP compared to a LIPW. We exploit an unanticipated intervention in the largest employment program in Papua New Guinea, which resulted in one intake of the program completing a LIPW and missing out on a comprehensive ALMP. We conduct a difference-in-difference analysis between participants in the intake that missed out on the ALMP component of the program and participants in the intakes immediately before and after. In contrast to most impact evaluations of ALMPs, we show youth that completed the comprehensive ALMP were around twice as likely to be employed in the formal sector 9 to 12 months after the program compared to similar youth in the intake that only completed a LIWP. This effect was entirely driven by 20 per cent of youth who participated in the ALMP staying with the employer they were placed with following the end of the program. Surveys of these employers illustrate that they use the ALMP as a low cost, low risk and relatively low effort way of hiring new employees.

JEL-Classification: J08, J30, J68, O15

Keywords: Active Labor Market Policy; Jobs; Wage Subsidies; Vocational Training; Job Search

---

[1]Australian National University (132 Lennox Crossing Acton ACT 2601 Australia) and corresponding author (christopher.hoy@anu.edu.au), [2] World Bank (World Bank Sydney Office, Level 19, 14 Martin Place Sydney NSW 2000 Australia, dnaidoo@worldbank.org).

1 Introduction

The vast majority of young people in developing countries do not have a formal sector job and earn an income through a range of activities classified as "vulnerable employment" by the International Labour Organization. To address this issue, billions of dollars have been spent by governments and aid donors on programs that typically take the form of either active labor market programs (ALMPs) or Labor Intensive Public Works Programs (LIPWs). The former aims to improve the long-term employability of youth by providing training, work placements and job searching assistance, whereas the latter is a form of social protection through the creation of temporary employment opportunities. The key difference is that ALMPs tend to be more resource intensive, as they aim to create employment for participants beyond the life of a program, as opposed to LIPWs where the benefits are expected to be short term. However, there is a growing evidence base indicating that ALMPs fail to achieve their aim and tend to have little to no impact on employment (McKenzie 2017; Blattman and Ralston 2015). This raises the question as to whether policymakers should only invest in LIPWs if there are no additional employment benefits from ALMPs beyond those of LIPWs.

This is the first study to explore this question and we do so by rigorously testing the additional impact from an ALMP beyond an LIPW in Port Moresby, the capital city of Papua New Guinea (PNG). The government of Port Moresby (NCDC) has been conducting the Urban Youth Employment Program (UYEP), in partnership with the World Bank, for unemployed youth since 2012. The program consists of both a LIPW component and a comprehensive ALMP component. The latter includes vocational training, job matching and fully subsidized work placements for a five-month period. Only youth who perform well on a basic numeracy and literacy test and attend training prior to the LIPW component are eligible for the ALMP component. We evaluate the additional benefit of the ALMP by exploiting the unanticipated cancellation of the ALMP component midway through the LIPW component of one intake of the program. Specifically, we conduct a difference-in-difference analysis between eligible youth in the intake that missed out on the ALMP (they only completed the LIPW component and a one-week basic training course prior to the LIPW) with the youth in the intakes

immediately before and after that completed both the LIPW and ALMP components.

We show that the youth that completed both program components were around twice as likely to be employed in the formal sector 9 to 12 months after the program compared to the eligible youth in the intake that only completed the LIWP component. This effect was driven by 20 per cent of ALMP participants staying with the employer they were placed with following the end of the program. Surveys of employers illustrate that partnering with UYEP provides them with a low-cost, low-risk and relatively low-effort way to screen potential new employees.

These findings are contrary to the bulk of existing evidence that shows ALMPs tend to have little or no effect on employment (McKenzie 2017; Blattman and Ralston 2015). We provide evidence suggesting this may be due to the comprehensive nature of the ALMP component of UYEP. Most ALMPs only provide youth with one of the following: subsidized job placements, vocational training, or job search and matching assistance. In contrast, the ALMP component of UYEP includes all three of these aspects (in addition to the initial LIWP component) and lasts for six months. Employer surveys illustrate that each of these aspects of UYEP contribute to them offering youth the opportunity to continue working for them following the conclusion of the program.

This paper is structured as follows. Firstly, we present the related literature on ALMPs and our contribution followed by a discussion of the context the program is operating in and provide details about the program. This is followed by a description of the difference-in-difference methodology we employ and evidence is provided in support of the "equal trends" assumption. We then present the main findings, some suggestive evidence from an employer survey, and discuss the implications of the results.

2 Related literature and our contribution

There has been a significant number of impact evaluations of ALMPs in a variety of contexts and the vast majority have shown they tend to have little to no effect (McKenzie 2017). In particular, programs that only include one component of an ALMP (either subsidized job placements, vocational training, or job search and matching assistance) tend to have no impact on employment. The direct employment benefits from subsidized

job placements, whereby participants complete internships and their wages are subsided, tend to only be short lived as the effect quickly diminishes once the program is completed (McKenzie 2017). In addition, in some cases subsidizing job placements has been shown to negatively affect employment opportunities of individuals who do not participate in the program, which suggests that the aggregate number of job opportunities in the labor market is not being increased (Groh et al. 2016). Blattman and Ralston (2015) show that providing participants with vocational training rarely generates jobs (unless a cash grant is provided) and almost never passes a basic cost-benefit test. Training conducted by private institutions that tailor the education to meet the demands of the private sector have been shown to be slightly more effective, however even in these cases the benefits drop off quickly over time (Hirshleifer et al. 2016). Another type of ALMP consists of providing job search and matching assistance, which is substantially cheaper than wage subsidies and training (Caria and Lessing 2019). However there is very little evidence that this type of ALMP has an effect on employment in developing countries (McKenzie 2017).

There is some evidence to suggest that ALMPs that combine two or more of these components are more effective. In Latin America, a number of programs (such as entra21, Jovenes, and Juventud y Empleo) combine vocational training with subsidized work placements and they have been shown to have a positive effect on formal employment but not overall employment (i.e. both formal and informal) (e.g. see Alzua et al. 2016; Attanasio et al. 2015; Diaz and Rosas 2016). A recent study in Uganda shows that combining vocational training or subsidized work placements (in the form of internships) with job matching assistance resulted in large employment benefits that lasted four years after the program (Alfonsi et al. 2017). The authors of this study argue that vocational training was more beneficial than subsidized work placements as participants learnt more sector-specific as opposed to firm-specific skills.

A major shortcoming of most existing impact evaluations on this topic is their inability to disentangle whether the impact they are detecting is due to youth simply being part of an employment program or the actual content of the program (McKenzie 2017). Specifically, Beam et al. (2016), Galasso et al. (2004), and Levinsohn and Pugatch (2014) have shown that simply being part of a program, as opposed to the nature of the

program itself, can have an effect on formal sector employment. Many impact evaluations on this topic are unable to overcome this issue because they use comparison groups that are not part of the program, such as a control group in a randomized controlled trial whose members do not participate in the program. In these cases, studies may overestimate the impact of the particular type of program as they are estimating the effect of a combination of being part of any employment program and the effect of the particular type of program they are evaluating.

Against this background, we make four contributions to the existing literature on this topic. This is the first study to rigorously investigate the marginal effect of an ALMP beyond a LIWP. Existing research has tended to focus on the impact of participating in just one type of program relative to not participating in any program. Secondly, we investigate the effect of one of the most comprehensive ALMPs in the developing world as it provides participants with vocational training, job matching and fully subsidized work placements over a period of eight months. Previous impact evaluations have typically analysed the effect of more limited ALMPs, such as those that only provide vocational training or wage subsidies. Thirdly, we overcome the challenge faced by most other impact evaluations by having a "placebo" comparison group of program participants that do not fully participate in the program compared to the treatment group (they only do the LIWP component). This ensures that the effect we detect is driven by the content of the program as opposed to simply being part of any program (however we cannot rule out the possibility that differences between the treatment and control groups are partly due to the duration of exposure to the program). Finally, this study is one of only a small number of rigorous impact evaluations that have been completed in the very challenging context of Papua New Guinea. By doing so our study helps to enable evidence-based policymaking in this part of the world.

3 Details about the context and the program design

3.1 The context the program is operating in

UYEP is conducted in Port Moresby, the capital and largest city in PNG. Across the country the number of jobs in formal sector employment reduced by 10 per cent from 2013 to 2017 and more than half the population is under the age of 25 (BPNG 2018; UNFPA 2014). Formal sector employment peaked at 16 per cent of the labor force in 2013 following six years of strong economic growth driven from some mining projects, however since this time the non-mining economy has been undergoing a significant downturn (Jones and McGavin 2015; BPNG 2018). Two-thirds of formal sector jobs are in the private sector (heavily concentrated in the wholesale and retail trade sector and construction), with the remainder in the public sector (NSO 2013; Jones and McGavin 2015). There are large skill shortages in a variety of trades, such as carpentry, hospitality, retail and office administration (Imbun 2015). In addition, the cost of labor is quite high as the minimum wage was around 1.22 United States Dollars (USD) per hour in 2018, which is the same as countries with Gross Domestic Product (GDP) per capita four times that of PNG (such as Malaysia) (Jones and McGavin 2015).

Despite the large skill shortages, there are few opportunities for youth to enter the formal sector labor market in Port Moresby. Since the end of the mining boom in 2013, private sector employment has fallen by 20 per cent in Port Moresby, led by large declines in the construction industry followed by wholesale and retail trade (BPNG 2018). In addition, each year more than 80,000 youth leave secondary school across the country but most are not trained well enough to transition into formal sector roles (Voigt-Graf 2017). There are only limited places available at technical colleges and universities (just over 5,000 across the country), which restricts the options available for youth to be trained to fill some of the skill shortages (Voigt-Graf 2017). This issue is particularly acute in Port Moresby as a large number of young people migrate there in search of better job opportunities (Voigt-Graf 2017). It is estimated that there are at least 40,000 unemployed youth currently in Port Moresby (World Bank 2018). This is set to grow as the number of people between the age of 15 to 35 in PNG is expected to increase by more than 50 per cent over the next 25 years (UNFPA 2018).

3.2 The design of the program

The government and aid donors have invested in a range of strategies to address the lack of opportunities in the formal sector for youth and the largest program to date is UYEP. There are two components of UYEP, all participants complete the first component while around 25 per cent of participants complete the second. The first component of UYEP is a 40-day LIPW called Youth Job Corps (YJC), which primarily focuses on the provision of temporary employment through activities like collecting trash off the streets. The second component is a comprehensive ALMP called On-the-Job Training (OJT), which begins with a vocational training course for 20 days followed by a fully subsidized placement with a formal sector employer for five months. These placements are in occupations where there are large skill shortages, primarily hospitality, retail and office administration. UYEP begins with a one-week Basic Life Skills Training (BLST) course, which includes a basic numeracy and literacy test. Only individuals that perform well on the test and satisfactorily complete the BLST course are eligible to progress to the ALMP component (OJT).

UYEP is an established program, having existed since 2012 and with over 20,000 participants, of which over 2,000 graduated from the comprehensive ALMP component. To be eligible for UYEP, individuals need to have been out of the formal sector labor market for over six months, be between the ages of 16 to 35, have been based in Port Moresby for at least one year, and attend a screening interview held at various locations throughout Port Moresby. Each of these aspects of the eligibility criteria were verified through consultation with community leaders. New intakes of youth are enrolled every three to four months with over 20 intakes occurring since the program began. Youth first undertake 5 days of BLST and 40 days of a LIWP (YJC) shortly after the baseline survey and those who are eligible undertake the ALMP component (OJT) once job placements are arranged. The project management unit has relationships with over 100 employers who regularly provide placements for youth.

4 Methodology and Data

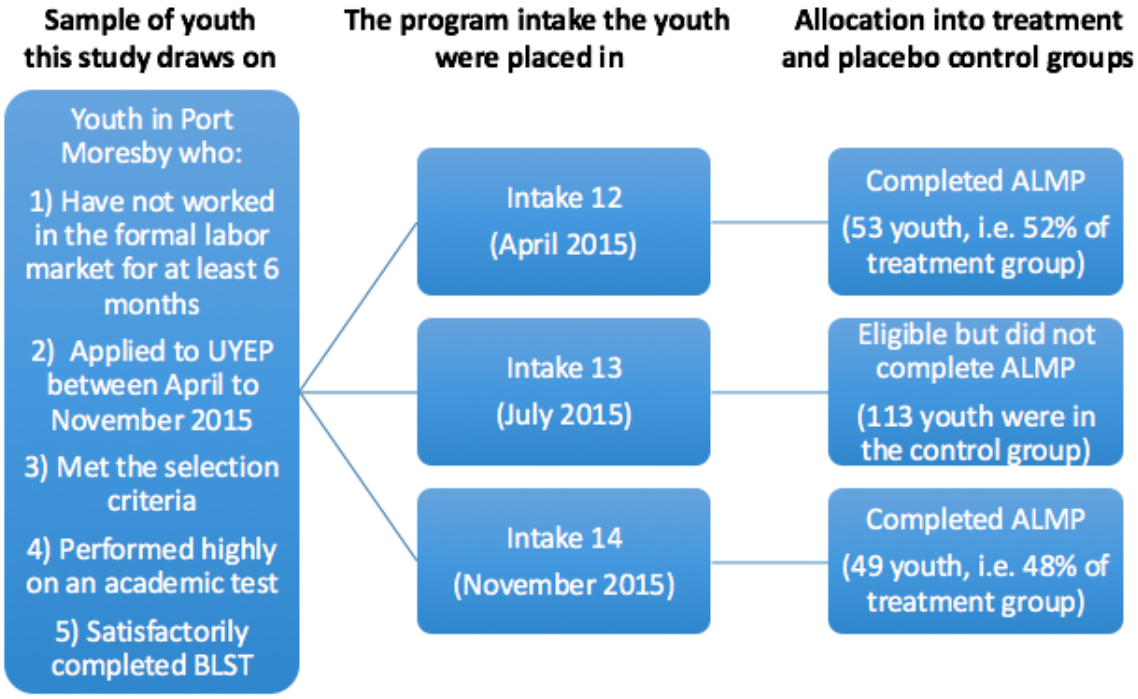
4.1 Identification strategy

To determine the impact of the ALMP component of this program (beyond just the LIWP component) we conduct a difference-in-difference analysis and exploit a one-off, unexpected change in the implementation of the program. Specifically, during intake 13 of UYEP there was an unanticipated intervention in the program and the standard ALMP component was removed part way through the LIWP component. Instead, participants were offered the opportunity to be paid to be a volunteer at the 2016 Under 23 Women's FIFA World Cup. Youth who undertook this placement were only engaged for around one-third of the period of time as youth who undertook the standard ALMP (2 months compared to 6 months). It seems unlikely that if the duration of the volunteer program had been longer, employability of the youth in this intake would have been improved. The volunteer placement only involved basic manual labor, limited training opportunities and there was no potential for ongoing employment with the employer as this was a one-off event. As such, program participants in intake 13 who were eligible to complete the ALMP component because of their academic performance in the screening test and satisfactory completion of BLST did not complete an ALMP. Following intake 13, the usual program resumed whereby people who were eligible completed the ALMP component as was the case in earlier intakes. Importantly, the change in the program for intake 13 was not made public until after youth for intake 14 had expressed interest in UYEP and all youth in the treatment who were eligible to participate in the ALMP component of the program took up this opportunity.

The youth who were eligible for the ALMP component in intake 13, but missed out due to the temporary change to the program ("placebo" control group), are comparable to the youth in the intakes just before and just after (intakes 12 and 14) who completed the ALMP component (treatment group) for five reasons (Figure 1). Firstly, all youth in each of the three intakes had not worked in the formal sector in the last six months and on average between 75 and 80 per cent of the youth had never worked in the formal sector throughout their life. Secondly, intakes 12, 13 and 14 occurred at a relatively similar time (the baseline surveys occurred in April, July and November 2015, respectively).

Thirdly, the youth are sourced from the same areas in Port Moresby and expressed interest in the program through the same channels. Fourthly, the removal of the ALMP component of the program during intake 13 was not known by participants at the time the intake began and they were only informed of this change part way through the LIWP component. Finally, statistical balance calculations show that there were almost no statistically significant differences between the demographic characteristics of treatment and control groups (see section 4.2).

Figure 1: Process of selecting treatment and "placebo" control groups



The main outcomes of interest are whether the treatment group outperformed the control group in terms of employment in the formal sector, earning a cash income and seeking employment. The exact wording of each of the questions is shown in Table 1 below and they are based on what has been used in other impact evaluations on this topic (McKenzie 2017).

Table 1: Questions that were asked to measure the main outcomes of interest

Main outcome	Exact question
Formal sector employment in last six months	Are you currently in or did you have a part-time or full-time wage job in the past six months in the formal sector? (That is, regular or ongoing employment, not self-employment or temporary work)
Average weekly wage from formal sector employment (Kina)	How much money do you earn / did you earn from this work each week?
Average number of hours worked in a week in formal sector employment	How many hours per week on average, do you work or did you work?
Earned cash in last four weeks	We know that you may earn cash from a range of different activities such as informal selling and temporary work. Now I want to consider everything that you have done in the last 4 weeks to earn cash, if you have earned cash. Did you earn any cash from any activities at all in the last 4 weeks?
Sought job in last three months	Have you sought any kind of paid job in the last 3 months?

Note: These questions were typically asked in the local dialect, Tok Pisin.

The baseline survey was conducted from April to November 2015 when youth were registering to participate in the program. The follow-up survey was conducted in July to August 2017, which was around nine months after all youth from these three intakes had completed the program.

4.2 Sample size and statistical balance

There were 355 program participants who met the criteria outlined above and completed the baseline survey. Among these respondents, 215 were re-interviewed in the follow up survey (113 in the control group and 102 in the treatment group). Respondents in the treatment group were only three percentage points more likely to complete the follow up survey than respondents in the control group. We show in Appendix A1 that on average there was no difference in the demographic characteristics between respondents who were re-interviewed and those that were not, except in regards to education. Respondents in the treatment group who were re-interviewed were more likely to have lower levels of education at baseline (there were no statistically significant differences between respondents in the control group who were re-interviewed and those that were not). The relatively

small sample size (compared to other impact evaluations of ALMPs) means we are only adequately powered to detect statistically significant differences between treatment and control groups of at least 8 percentage points.

Statistical balance calculations show that there were no statistically significant differences (at a p-value below 0.05) between the demographic characteristics of respondents who completed both surveys in the treatment and control groups. Table 2 below shows that the only statistically significant difference between these groups is that those in the treatment group were slightly older.

Table 2: Statistical balance across background characteristics

Variable	N	(1) Control Mean/SE	N	(2) Treatment Mean/SE	t-test (2) - (1) Difference
Age	113	24.575	102	25.706	1.131*
		[0.479]		[0.444]	
Share that are male	113	0.558	102	0.647	0.09
		[0.047]		[0.048]	
Share that are married	113	0.398	102	0.412	0.014
		[0.046]		[0.049]	
Total number of household members	113	8.770	102	8.392	-0.378
		[0.417]		[0.448]	
Female household members	113	3.929	102	3.892	-0.037
		[0.206]		[0.265]	
Male working household members	113	1.044	102	1.029	-0.015
		[0.102]		[0.115]	
Share with concrete floor	113	0.053	102	0.078	0.025
		[0.021]		[0.027]	
Share with wood floor	113	0.894	102	0.882	-0.011
		[0.029]		[0.032]	
Years of education	112#	9.098	102	9.461	0.363
		[0.196]		[0.198]	

Standard errors (SEs) in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
N refers to the number of observations
One people in the control group did not provide an answer to this question

4.3 Addressing the Equal Trends Assumption

Sections 4.1 and 4.2 outline how the treatment and placebo control groups were clearly comparable at the time of the baseline survey, however the key assumption of a difference-in-difference analysis is that in the absence of the program the comparability of the groups

would have lasted over time (i.e. there would be "equal trends"). We take two steps to illustrate that this equal trends assumption is reasonable. Firstly, we show that youth in the treatment and control groups experienced very similar employment and job-seeking histories prior to the program. While we only have two rounds of survey data (before and after the program), the baseline survey includes a number of questions that provide insight into respondents‘ lives at various points in time (see Table 3). There are no statistically significant differences between the treatment and control groups across a range of characteristics that capture their employment and job-seeking histories. This provides good reason to believe they would have had very similar trajectories for employment and job-seeking outcomes in the absence of the program.

Table 3: Statistical balance across employment and job-seeking histories

Variable	N	(1) Control Mean/SE	N	(2) Treatment Mean/SE	t-test (2) - (1) Difference
Share that have never worked in formal sector	113	0.743	102	0.794	0.051
		[0.041]		[0.040]	
Number of formal sector jobs in lifetime	113	0.389	102	0.343	-0.046
		[0.058]		[0.065]	
Earn any money over last six months	113	0.496	102	0.510	0.014
		[0.047]		[0.050]	
Sought a formal sector job in last three months	113	0.150	102	0.147	-0.003
		[0.034]		[0.035]	
Sought any job last week	113	0.080	102	0.069	-0.011
		[0.026]		[0.025]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.

In addition, there were few opportunities for these unemployed youth to enter the formal sector. As discussed above, the levels of formal sector employment in Port Moresby declined by 20 per cent from 2013 to 2017 and most employers were not hiring new staff (BPNG 2017). As such it is highly unlikely that opportunities in the formal sector for the youth in these intakes that are three months apart would have varied dramatically in the absence of the program.

The second step we take to illustrate the credibility of the equal trends assumption is to follow Duflo (2001) and conduct a placebo test. This involves selecting groups of

individuals in the same intakes as the treatment (intakes 12 and 14) and control groups (intake 13) who were not affected by the program, and conducting difference-in-difference analysis. If there are no statistically significant differences in outcomes this provides further evidence that in the absence of the program the trajectory of outcomes of the actual treatment and control groups would have been comparable. The design of this study naturally lends itself to conducting a placebo test using UYEP participants who were not eligible to complete the ALMP component due to their performance in the academic test in intakes 12, 13 and 14. We show in Table 4 below that there are no statistically significant differences between these groups across demographic characteristics.

Table 4: Statistical balance between placebo groups in intake 13 and intakes 12 and 14

		(1) Intake 13 Placebo group		(2) Intakes 12-14 Placebo group	Difference
Variable	N	Mean/SE	N	Mean/SE	(2)-(1)
Age	134	23.522	224	23.415	-0.107
		[0.449]		[0.323]	
Share that are male	134	0.552	224	0.567	0.015
		[0.043]		[0.033]	
Share that are married	134	0.425	224	0.366	-0.059
		[0.043]		[0.032]	
Years of education	120#	7.442	198#	6.949	-0.492
		[0.256]		[0.202]	
Household members	134	9.119	224	8.763	-0.356
		[0.441]		[0.321]	
Female household members	134	4.269	224	3.911	-0.358
		[0.240]		[0.176]	
Male working household members	134	1.239	224	1.196	-0.042
		[0.129]		[0.088]	
Share with concrete floor	134	0.060	224	0.062	0.003
		[0.021]		[0.016]	
Share with wood floor	134	0.910	224	0.862	-0.049
		[0.025]		[0.023]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Some respondents did not provide an answer to this question

4.4 Empirical strategy

To estimate the effect of the ALMP component on the main outcomes in Table 1, we conduct a difference-in-difference, Ordinary Least Squares (OLS) regression in the form

of a linear probability model that can be written as follows:

$$Y_{it} = \beta_0 + \beta_1 After_t + \beta_2 Treatment_i + \beta_3 After_t Treatment_i + \varepsilon_{it}$$

where Y_{it} is a dummy variable for each of the outcomes of interest discussed in Table 1, $Treatment_i$ is a dummy variable that takes the value of one if the respondent belongs to the treatment group and the value of zero if the respondent belongs to the control group, $After_t$ is a dummy variable that takes the value of one for the follow-up survey and zero for the baseline survey and ε_{it} is the model error term. β_3 captures the average difference in differences in regards to the outcomes of interest (Y_{it}) between respondents in treatment group and the control group (i.e. the treatment effect).

The estimates of the OLS regression above are compared to those obtained from a binary logit model and they are qualitatively similar (see Appendix A2). In addition, the OLS regression above is conducted controlling for baseline characteristics and the results are very similar (see Appendix A2).

5 Marginal Impact of the ALMP component of UYEP

5.1 Effect on employment and job-seeking behavior

The ALMP component has a large effect on formal employment, with a 41.2 percentage point increase in the share of participants in the treatment group who are currently working or worked in the last six months compared to a 23.0 percentage point increase in the control group (see Table 5). This is from a starting point of no formal employment in the last six months at the time of the baseline survey, which means the 18.2 percentage point difference can be attributed to the effect of the program. This difference in the overall rate of formal sector employment resulted in youth in the treatment group having on average higher weekly wages and working more hours in the formal sector. However conditional on being employed there were no statistically significant differences in wages

and hours worked between the treatment and control groups. On average, participants who worked in the formal sector currently or in the last six months in the treatment group worked 47.3 hours a week (compared to 43.3 in the control group) and earned 170 Kina a week (approximately USD50) (compared to 179 Kina (approximately USD53) in the control group). This suggests the benefits from the ALMP component of the program are entirely on the extensive margin as opposed to the intensive margin (i.e. more people were employed as opposed to employed people working more hours and/or earning more).

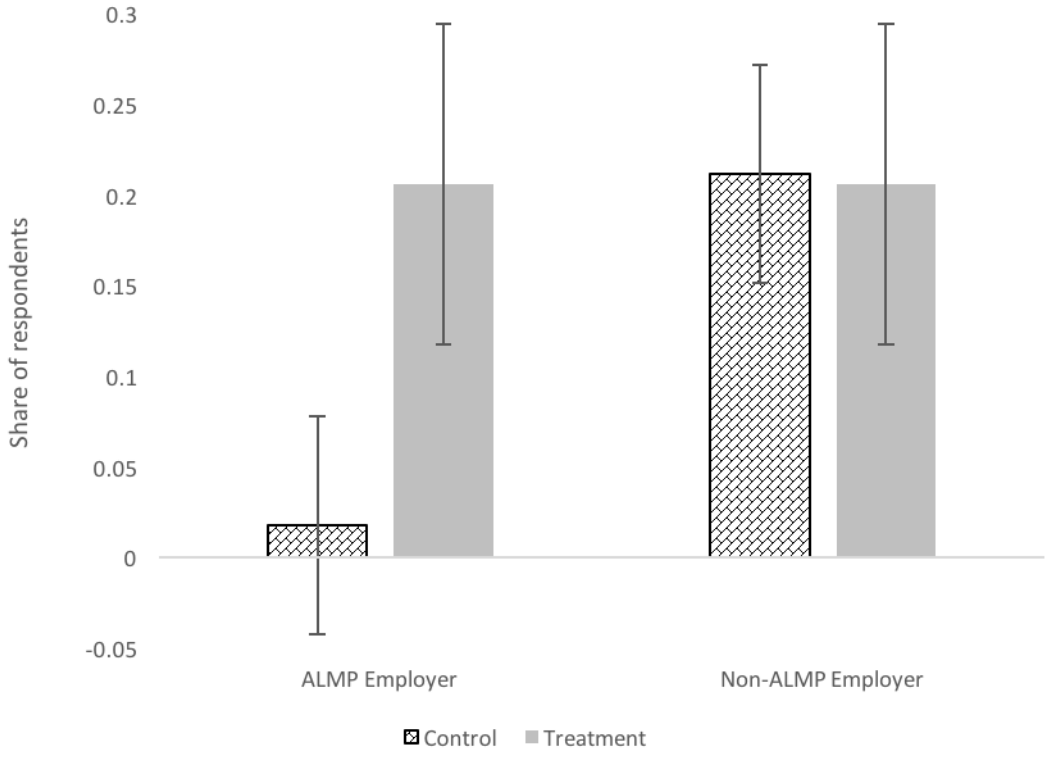
The large effect on employment from the program is due to youth continuing to work with the employer they were placed with after the end of the program (see Figure 2). In the treatment group, 20 per cent of participants were employed with their ALMP employer at the time of the follow-up survey, compared to no one in the control group as this option was not available for them. In comparison, there was no statistically significant effect from the program on formal sector employment with a different employer, as 21 per cent of youth in both treatment and control groups were employed somewhere other than their ALMP employer. This suggests the effect of the ALMP on formal sector employment is a level shift in outcomes (i.e. increase in the likelihood of having employment immediately following the program) as opposed to an increase in the rate at which an individual might be employed in the future.

Table 5: Effect of the program on employment and job-seeking behavior

Variable	N	(1) Control Mean/SE	N	(2) Treatment Mean/SE	t-test (2)-(1) Difference
Formal sector employment in last six months					
Baseline	113	0.000	102	0	0
		[0.000]		[0.000]	
Endline	113	0.230	102	0.412	0.182***
		[0.040]		[0.049]	
Difference	113	0.230	102	0.412	0.182***
		[0.040]		[0.049]	
Average weekly wage (Kina)#					
Baseline	113	0.000	102	0	0
		[0.000]		[0.000]	
Endline	113	87.673	102	123.255	35.582***
		[9.603]		[7.994]	
Difference	113	87.673	102	123.255	35.582***
		[9.603]		[7.994]	
Average number of hours worked in a week#					
Baseline	113	0.000	102	0	0
		[0.000]		[0.000]	
Endline	113	23.805	102	36.843	13.038***
		[2.446]		[2.545]	
Difference	113	23.805	102	36.843	13.038***
		[2.446]		[2.545]	
Earned cash in last four weeks					
Baseline	113	0.381	102	0.343	-0.037
		[0.046]		[0.047]	
Endline	113	0.540	102	0.49	-0.05
		[0.047]		[0.050]	
Difference	113	0.159	102	0.147	-0.012
		[0.062]		[0.064]	
Sought job in last three months					
Baseline	113	0.150	102	0.147	-0.003
		[0.034]		[0.035]	
Endline	113	0.230	102	0.324	0.093
		[0.040]		[0.047]	
Difference	113	0.080	102	0.176	0.097
		[0.051]		[0.060]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Note: # in formal sector employment

Figure 2: Impact of the program on formal employment by type of employer



Note: Two respondents in the control group claimed to be employed with their ALMP employer even though they did not complete the ALMP. This is why in the figure above the control group does not have 0 per cent employment by ALMP employers.

Similar to the results of other impact evaluations of ALMPs (McKenzie 2017), the program did not lead youth in the treatment group to be more likely to have earned cash or searched for a job compared to youth in the control group (see Table 5). However the program does have a positive effect on job seeking behaviour if we restrict our analysis to youth who did not have a job in the formal sector in the last six months. Among these youth there was a 24.2 percentage point difference between changes in job-seeking behavior between treatment and control groups.

5.2 Placebo test for employment and job-seeking behavior

We illustrate the robustness of the results in Section 5.1 above by conducting a placebo test of the equal trends assumption. As discussed Section 4.3 we compare the change in outcomes for individuals in the same intakes as the treatment (intakes 12 and 14)

and control groups (intake 13) who were not eligible to complete the ALMP component due to their performance in the academic test. These individuals only completed the LIWP component of the program. The results of the placebo test are shown in Table 6 below. There are no statistically significant differences in outcomes, which provides further evidence that the equal trends assumption is reasonable.

Table 6: Results of the placebo test of the equal trends assumption

Variable	N	(1) Intake 13 Placebo group Mean/SE	N	(2) Intakes 12-14 Placebo group Mean/SE	Difference (2)-(1)
Formal sector employment in last six months					
Baseline	134	0.000	224	0.000	0
		[0.000]		[0.000]	
Endline	134	0.254	224	0.183	-0.071
		[0.038]		[0.026]	
Difference	134	0.254	224	0.183	-0.071
		[0.038]		[0.026]	
Average weekly wage (Kina) #					
Baseline	134	0.000	224	0.000	0
		[0.000]		[0.000]	
Endline	134	70.090	224	60.045	-10.045
		[8.114]		[6.185]	
Difference	134	70.090	224	60.045	-10.045
		[8.114]		[6.185]	
Average number of hours worked in a week #					
Baseline	134	0.000	224	0.000	0
		[0.000]		[0.000]	
Endline	134	18.754	224	15.348	-3.406
		[2.196]		[1.528]	
Difference	134	18.754	224	15.348	-3.406
		[2.196]		[1.528]	
Earned cash in last four weeks					
Baseline	134	0.321	224	0.339	0.018
		[0.040]		[0.032]	
Endline	134	0.604	224	0.571	-0.033
		[0.042]		[0.033]	
Difference	134	0.284	224	0.232	-0.051
		[0.053]		[0.044]	
Sought job in last three months					
Baseline	134	0.052	224	0.094	0.042
		[0.019]		[0.020]	
Endline	134	0.179	224	0.192	0.013
		[0.033]		[0.026]	
Difference	134	0.127	224	0.098	-0.029
		[0.036]		[0.032]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$. # in formal sector employment

The outcomes shown in Table 6 are not directly comparable to those shown in Table 5 because the time between the follow up survey and when youth exited the program is substantially different. Youth in the treatment and control groups did not exit the program until a much longer period of time had passed (in some cases over a year) than youth in the placebo analysis above (see further discussion in Appendix 3). As such the follow up survey was around 18-24 months after the youth in the placebo analysis exited the program, while the follow up survey was around 9-12 months after the youth in the treatment and control groups completed the program. This means that the youth included in the placebo analysis (those that were ineligible for the program) had spent on average almost twice as long in the labor market following the conclusion of the program as eligible youth in the same intakes. As a result they have had substantially more time following the program to find alternative employment opportunities than youth in the treatment and control groups.

6 Supplementary evidence from an employer survey

The findings above show the employment benefits for youth from UYEP are predominantly driven by employers continuing to engage ALMP participants beyond the end of the program. To verify this result and to provide a qualitative understanding of the degree that each component of UYEP contributed to this, we surveyed a sample of 65 out of 100 employers involved in the program. The sample consisted of all the largest employers (those that had more than 10 ALMP placements over the last two years) and a random selection of the remaining employers who had at least one ALMP placement over the last two years. This survey showed a very similar rate of post-program employment for youth who completed the ALMP (20 per cent) as was reported by program participants themselves (discussed above). Employers repeatedly highlighted the importance of each of the three components of UYEP (the provision of a subsidized wage, the training provided to participants, and the job matching process) in playing a key role in

why they participate and continue to employ youth beyond the ALMP placement. The findings of the survey that relate to each of these components are discussed below.

6.1 Subsidized wage

Employers involved in UYEP did not need to pay the ALMP participants throughout the five-month placement (their wage was provided by the program) and this appears to be essential for at least three reasons. Firstly, most employers would not have participated in the program to the same extent in the absence of a subsidy. We captured employers‘ willingness to pay by asking how many ALMP placements they intended to offer over the next year with the full subsidy, if only half the subsidy was offered, or if no subsidy was in place. On average, only 30 per cent of employers would keep the same number of placements if they received half the subsidy and less than 15 per cent of employers would keep the same number of placements if there was no subsidy. Secondly, 45 per cent of employers stated the number one change they would make to the program would be to increase the time period of ALMP beyond five months (assuming the full subsidy remained). Finally, the subsidy allowed some employers to reduce the total labor costs of their business as 28 per cent reported that they would have more staff in the absence of UYEP (compared to 10 per cent that said they would have fewer staff). This suggests a displacement effect from the program as fewer jobs may have been available in the labor market for non-participants. However, the extent of the displacement effect is unknown and it may not fully offset the employment benefits created for the program participants.

6.2 Training

The importance of the training provided to youth to overcome the skill shortages in the labor market was consistently highlighted by employers. One of the main barriers to employers hiring more staff is that "training new staff is too costly", with this option being listed as one of the top three reasons provided by 52 per cent of employers. The

popularity of this response is even higher than "economic conditions" (listed by 49 per cent of employers), which is noteworthy given the downturn in the non-mining sector in PNG. In light of this, it is not surprising that 51 per cent of employers listed the training provided to youth prior to ALMP placements as the most important aspect of the program. Further, 49 per cent of employers wanted the amount of training provided to youth prior to the placement increased, which was the highest response provided in regard to a question about how to improve the program.

6.3 Matching

Employers appear to have used the ALMP placements as a low-cost way to screen youth prior to deciding whether they wanted to offer them a job. More employers stated that the main reason they offered jobs to ALMP youth was due to the performance of the youth undertaking the placement as opposed to any need for additional staff (52 per cent compared to 37 per cent). This is reinforced by the finding that one of the main barriers to hiring more staff employers face is that "staff with the right skills are difficult to find" (52 per cent of employers included this as one of the top three answers). Further, employers indicated that UYEP was the third most common way they recruited new staff, after newspaper advertisements and job agencies.

7 Discussion of the results

This study has shown that youth who participated in the ALMP component of UYEP were around twice as likely to be employed in the formal sector 9 to 12 months after the program compared to those youths who just completed the LIWP component. This is counter to the bulk of the existing evidence on ALMPs that tends to show they have little impact (McKenzie 2017) and we provide evidence suggesting this may be due to the comprehensive nature of UYEP. Most ALMPs only consist of wage subsidies, vocational training, or job matching assistance and any one of them in isolation may not result

in higher employment if there are multiple frictions in the labor market. For example, only providing youth with vocational training is unlikely to increase their employment prospects if employers do not have a low-cost way of finding and screening candidates before hiring them. Similarly, subsidizing work placements in the absence of training or matching of potential employees with firms is less likely to lead to post-program employment when training employees on the job is quite costly for employers. Further, employers are less likely to hire employees who are matched with their firm if they lack basic training or they need to pay them a relatively high wage immediately.

The comprehensive nature of the ALMP component in UYEP is likely to have helped tackle multiple frictions in the labor market, which could explain the observed increase in the likelihood that the youth who completed the ALMP component remained employed in the formal sector after the program. Employers have their adverse selection risk reduced as the subsidized job placements help provide a low-cost option to screen candidates and terminate poorly performing youth. In addition, UYEP provides employers with a somewhat "filtered" pool of potential employees who have all received a base level of training and have a minimum standard of numeracy and literacy. There is no shortage of supply of youth wishing to participate in UYEP as they are able to gain experience in the formal sector (for the first time for most of them), receive training and be paid the minimum wage, which is relatively high by international standards.

The ALMP component of the program is substantially costlier than the LIWP, which means that even though the employment benefits are larger this might not justify the additional investment. The marginal cost of funding an ALMP placement beyond a LIWP placement in UYEP was around USD1500 per person. A back of the envelope calculation suggests that the large employment effects above would need to persist for well over three years for the additional income gained by program participants to outweigh the cost of the program. This means that despite the relatively high post-program employment rates due to the ALMP component, the benefits might still not be as large as the cost. This is consistent with the existing evidence that shows ALMPs rarely have

cost benefit ratios greater than one (McKenzie 2017, Blattman and Ralston 2015).

The findings from this impact evaluation also suggest two limitations of the ALMP component of the program, which relate to who the youth are employed by and who benefits from the program. Firstly, the large effect on employment from the ALMP component is due to youth continuing with the employers they were placed with through the program. This would suggest that the skills these youths gained were mainly firm specific, and may not necessarily transfer to other firms and industries. This limitation of subsidized work placements has been shown in other studies (Alfonsi et al. 2017). As such there is little scope for scaling up the program because there is limited demand from the small number of firms in Port Moresby where an ALMP placement is feasible.

A second limitation is that even though we show large employment impacts for youth in the treatment group, the design of our study means we cannot rule out the possibility that the ALMP component did not increase the total number of jobs in the labor market. A displacement effect could have occurred whereby ALMP employers would have hired more people from elsewhere in the absence of the program and as a result total employment could have remained unchanged. Few studies have been able to rigorously test whether these general equilibrium effects exist (Groh et al. 2016).

8 Conclusion

This study illustrates that youth who participated in both ALMP and LIPW components of UYEP are substantially better off in the labor market than those who only completed the LIPW component. This is in contrast to previous studies that suggest there is little to no impact on employment from ALMPs. This discrepancy may be due to the comprehensive nature of the ALMP component of UYEP that includes subsidized job placements, vocational training, and job search and matching assistance. A major limitation of the comprehensive ALMP component of UYEP is that higher rates of post-program employment are due to youth staying on with the employer that they were

matched with as part of the program. This means that if a participant does not get a job immediately following the program with their ALMP employer, they are not any more likely to be employed.

The two main areas of further research that emerge from this study relate to the design and timeframe. Future impact evaluations could include a randomized control trial design where youth are randomly allocated to complete either an ALMP or LIPW so that it is possible to identify whether there is any difference in the effect between the programs. This study is unable to directly observe this as it only focuses on the additional benefit of an ALMP beyond an LIPW as opposed to the difference between the two. Another suggestion for further research is that youth are tracked regularly through follow-up surveys over a much longer timeframe. This would help identify the extent to which youth switch between employers over time or if there is limited movement within the formal sector labor market.

9 References

Alfonsi L, Bandiera O, Bassi V, Burgess R, Rasul I, Sulaiman M, Vitai A (2017) Tackling Youth Unemployment: Evidence from a Labor Market Experiment in Uganda. STICERD Development Economics Paper.

Alzua M, Cruces G, Lopez C (2016) Long run effects of youth training programs: Experimental Evidence from Argentina. Economic Inquiry 54(4): 1839-59.

Attanasio O Arlen G, Medina C, Meghir, C (2015) Long term impacts of vouchers for vocational training: Experimental evidence for Colombia. NBER working paper no. 21390.

Beam E, McKenzie D, Yang D (2016) Unilateral Facilitation Does Not Raise International Labor Migration from the Philippines. Economic Development and Cultural Change, 64(2): 323-68.

Blattman C, Ralston L (2015) Generating employment in poor and fragile states:

Evidence from labor market and entrepreneurship programs. Mimeo.

Bank of Papua New Guinea (BPNG) (2018) December 2016 Quarterly Economic Bulletin. https://www.bankpng.gov.pg/statistics/quarterly-economic-bulletin-statistical-tables/. Accessed 20 May 2018

Caria S, Lessing T (2019) Filling the gap: How information can help jobseekers. IGC Growth Brief Series 016, London.

Diaz J, Rosas D (2016) Impact Evaluation of the Job Youth Training Program Pro-Joven. IDB Working Paper no. 693.

Duflo E (2001) Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment. American Economic Review 91(4): 795-813.

Galasso E, Ravallion M, Salvia A (2004) Assisting the Transition from Workfare to Work: A Randomized Experiment. Industrial and Labor Relations Review 57(5): 128-42.

Groh M, Krishnan N, McKenzie D, Vishwanath T, (2016) Do wage subsidies provide a stepping stone to employment for recent college graduates? Evidence from a Randomized Experiment in Jordan. Review of Economics and Statistics 98(3): 488-502.

Hirshleifer S, McKenzie D, Almeida R, Cano C (2016) The Impact of Vocational Training for the Unemployed: Experimental Evidence from Turkey. Economic Journal 126: 2115-2146.

Imbun B (2015) Supporting Demand Led Vocational Skills Development in Papua New Guinea: A Labour Market Approach. Study prepared for Human Resources Development Programme Phase 2 (HRDP2) December 2015. Waigani.

Jones L, McGavin P (2015) Grappling afresh with labour resource challenges in Papua New Guinea. A Framework for Moving Forward. Institute of National Affairs Discussion Paper No. 96, Port Moresby.

Levinsohn J, Pugatch T (2014) Prospective Analysis of a Wage Subsidy for Cape Town Youth. Journal of Development Economics 108:169-183.

McKenzie D (2017) How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence. World Bank Research Observer, World Bank Group, vol. 32(2), pages 127-154.

National Statistical Office (2013) Census 2011: Final Figures Papua New Guinea. https://www.nso.gov.pg/ Accessed 20 May 2018.

United Nations Population Fund (UNFPA) (2018) UNFPA database. https://www.unfpa.org/data. Accessed 20 May 2018.

Voigt-Graf C (2017) Labour Market in PNG Background paper for Systematic Country Diagnostic (SCD) for PNG. World Bank Report.

World Bank (2018) Urban Youth Employment Program http://projects.worldbank.org/P114042/urban-youth-employment-project?lang=en. Accessed 20 May 2018

10 Declarations

10.1 Acknowledgements

The authors are grateful to seminar participants at the Australian National University and the University of Papua New Guinea. We are also very grateful for comments provided on an earlier version of this paper by Sonya Woo, Stephen Howes, Mathias Sinning and an anonymous reviewer.

10.2 Availability of data and materials

The data that support the findings of this study are available from the National Capital District Commission (NCDC) of Port Moresby but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the NCDC.

10.3 Competing interests

The IZA Journal of Development and Migration is committed to the IZA Guiding Principles of Research Integrity. The authors declare that they have observed these principles.

10.4 Funding

There is no funding source that needs to be acknowledged in this manuscript.

10.5 Disclaimer

This paper presents independent analysis and is solely the responsibility of the authors. The views presented in this paper should not be attributed to the World Bank.

10.6 Authors contributions

CH analyzed the data and drafted the paper. DN designed the surveys and managed the data collection. All authors read and approved the final manuscript.

11 APPENDICES

11.1 Attrition

Table A1 - Difference in background characteristics between respondents who were re-interviewed and those that were not in the treatment group

Variable	N	(1) Only in baseline survey Mean/SE	N	(2) In both baseline and follow up survey Mean/SE	t-test Difference (2)-(1)
Age	62	25.726	102	25.706	0.020
		[0.569]		[0.444]	
Share that are male	62	0.661	102	0.647	0.014
		[0.061]		[0.048]	
Share that are married	62	0.339	102	0.412	-0.073
		[0.061]		[0.049]	
Years of education	62	10.500	102	9.461	1.039***
		[0.172]		[0.198]	
Household members	62	7.742	102	8.392	-0.650
		[0.490]		[0.448]	
Female household members	62	3.500	102	3.892	-0.392
		[0.267]		[0.265]	
Male working household members	62	0.871	102	1.029	-0.158
		[0.125]		[0.115]	
Share with concrete floor	62	0.065	102	0.078	-0.014
		[0.031]		[0.027]	
Share with wood floor	62	0.855	102	0.882	-0.028
		[0.045]		[0.032]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.

Table A2 - Difference in background characteristics of respondents between who were re-interviewed and those that were not in the control group

Variable	N	(1) Only in baseline survey Mean/SE	N	(2) In both baseline and follow up survey Mean/SE	t-test Difference (2)-(1)
Age	78	24.051	113	24.575	-0.524
		[0.467]		[0.479]	
Share that are male	78	0.641	113	0.558	0.084
		[0.055]		[0.047]	
Share that are married	78	0.321	113	0.398	-0.078
		[0.053]		[0.046]	
Years of education	77	9.584	112	9.098	0.486
		[0.243]		[0.196]	
Household members	78	8.372	113	8.770	-0.398
		[0.491]		[0.417]	
Female household members	78	3.897	113	3.929	-0.032
		[0.269]		[0.206]	
Male working household members	78	1.231	113	1.044	0.187
		[0.138]		[0.102]	
Share with concrete floor	78	0.128	113	0.053	0.075*
		[0.038]		[0.021]	
Share with wood floor	78	0.808	113	0.894	-0.086*
		[0.045]		[0.029]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.

11.2 Different Econometric Specifications

Table A3 - Effect of the program using different econometric specifications

	OLS	OLS with controls	LOGIT
Formal sector employment in last six months	0.182***	0.164**	0.851***
	-0.06	-0.06	-0.3
Average weekly wage (Kina) #	35.582***	29.625**	N/A
	-12.64	-12.87	N/A
Average number of hours worked in a week #	13.038***	12.359***	N/A
	-3.53	-3.64	N/A
Earned cash in last four weeks	-0.012	-0.014	-0.077
	-0.09	-0.09	-0.27
Sought job in last three months	0.097	0.129	0.447
	-0.08	-0.08	-0.29

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
N/A: Not applicable because these outcomes are continuous
Note: # in formal sector employment

11.3 Further examination of the equal trends assumption

In the body of the paper, we illustrate that the employment outcomes of youth in the control group are substantially worse than the treatment group at the time of the follow up survey (Table 5), however there are relatively little differences between the employment outcomes of youth in the control group and either group in the placebo analysis (Table 6). At first glance this may draw into question the validity of the equal trends assumption between eligible youth in intakes 12 and 14 (the treatment group) and eligible youth in intake 13 (the control group). Assuming eligibility is positively associated with performance in the labor market, we would have expected that eligible youth in intake 13 would have achieved employment outcomes substantially better than ineligible youth in intakes 12, 13 and 14 (the groups used in placebo analysis). We show in Tables A4 and A5 below the point estimate for differences in employment outcomes are not very large (and rarely statistically significant).

Table A4: Differences in outcomes between youth in the control group and youth who were ineligible in intakes 12 and 14

Variable	N	(1) Ineligible youth in intakes 12 and 14 Mean/SE	N	(2) Control group Mean/SE	t-test (2)-(1) Difference
Formal sector employment in last six months					
Baseline	224	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	224	0.183	113	0.230	0.047
		[0.026]		[0.040]	
Difference	224	0.183	113	0.230	0.047
		[0.026]		[0.040]	
Average weekly wage (Kina) #					
Baseline	224	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	224	60.045	113	87.673	27.628**
		[6.185]		[9.603]	
Difference	224	60.045	113	87.673	27.628**
		[6.185]		[9.603]	
Average number of hours worked in a week #					
Baseline	224	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	224	15.348	113	23.805	8.457***
		[1.528]		[2.446]	
Difference	224	15.348	113	23.805	8.457***
		[1.528]		[2.446]	
Earned cash in last four weeks					
Baseline	224	0.339	113	0.381	0.041
		[0.032]		[0.046]	
Endline	224	0.571	113	0.540	-0.032
		[0.033]		[0.047]	
Difference	224	0.232	113	0.159	-0.073
		[0.044]		[0.062]	
Sought job in last three months					
Baseline	224	0.094	113	0.150	0.057
		[0.020]		[0.034]	
Endline	224	0.192	113	0.230	0.038
		[0.026]		[0.040]	
Difference	224	0.098	113	0.080	-0.019
		[0.032]		[0.051]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Note: # in formal sector employment

Table A5: Differences in outcomes between youth in the control group and youth who were ineligible in intake 13

Variable	N	(1) Ineligible youth in intake 13 Mean/SE	N	(2) Control group Mean/SE	t-test (2)-(1) Difference
Formal sector employment in last six months					
Baseline	134	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	134	0.254	113	0.230	-0.024
		[0.038]		[0.040]	
Difference	134	0.254	113	0.230	-0.024
		[0.038]		[0.040]	
Average weekly wage from (Kina) #					
Baseline	134	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	134	70.090	113	87.673	17.583
		[8.114]		[9.603]	
Difference	134	70.090	113	87.673	17.583
		[8.114]		[9.603]	
Average number of hours worked in a week #					
Baseline	134	0.000	113	0.000	0
		[0.000]		[0.000]	
Endline	134	18.754	113	23.805	5.052
		[2.196]		[2.446]	
Difference	134	18.754	113	23.805	5.052
		[2.196]		[2.446]	
Earned cash in last four weeks					
Baseline	134	0.321	113	0.381	0.060
		[0.040]		[0.046]	
Endline	134	0.604	113	0.540	-0.065
		[0.042]		[0.047]	
Difference	134	0.284	113	0.159	-0.124
		[0.053]		[0.062]	
Sought job in last three months					
Baseline	134	0.052	113	0.150	0.098***
		[0.019]		[0.034]	
Endline	134	0.179	113	0.230	0.051
		[0.033]		[0.040]	
Difference	134	0.127	113	0.080	-0.047
		[0.036]		[0.051]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Note: # in formal sector employment

We attribute the limited differences in employment outcomes (that are largely statistically insignificant) to differences in the timing of the follow up survey and when youth exited the program as opposed to raising a significant concern about the equal trends assumption. Eligible youth in intakes 12 and 14 (the treatment group) and eligible youth

in intake 13 (the control group) would on average wait around 6 months from completing the first stage of the program (the PWP) until beginning the second stage (the ALMP for youth in the treatment group and the alternative opportunity offered to the control group). This is because the timing of the recruitment of intakes do not perfectly match the availability of positions in the second stage of the program. Therefore eligible youth in a given intake do not exit the program until a much longer period of time has passed (in some cases over a year) than ineligible youth in the same intake. As such the follow up survey was around 18-24 months after ineligible youth exited the program, whereas the follow up survey was around 9-12 months after eligible youth completed the program. This means that the youth included in the placebo analysis had spent on average almost twice as long in the labor market following the conclusion of the program as youth in the treatment and control groups in the same intakes. As a result, they had substantially more time following the program to find alternative employment opportunities than youth in the treatment and control groups who exited the program without an ongoing job.

This issue of timing is particularly acute for eligible youth in intake 13 as they did not have any potential for future employment from the alternative opportunity offered to them as it was a one off event. Therefore all eligible youth in this intake were unemployed immediately following the conclusion of the program. In contrast, at least 20 per cent of youth in the treatment group (this is what is captured in the follow up survey 9-12 months after the program) had a job with their ALMP employer at the conclusion of the program. We show in Figure 2 there are no statistically significant differences between employment outcomes for youth in the control and treatment group who did not have a job following the program (i.e. among youth that did not continue to have employment with the employer they were matched with as part of the program), which is consistent with the equal trends assumption. This suggests the effect of the ALMP on formal sector employment is a level shift in outcomes (i.e. increase in the likelihood of having employment immediately following the program) as opposed to an increase in the rate

at which an individual might be employed in the future.

To provide further evidence in favour of the equal trends assumption we conduct two additional types of analysis whereby we use ineligible youth from intakes 12, 13 and 14 as control groups as opposed to the eligible youth in intake 13 that are used as the control group in the main regression analysis. Specifically, we conduct the identical analysis as presented in Table 5 however in one case we use ineligible youth in intake 13 as the control group and in the other case we use ineligible youth in intakes 12 and 14 as the control group. We present the findings of these additional types of analysis in Tables A6 and A7 below. The main results hold using these alternative specifications.

Table A6: Differences in outcomes between youth in the treatment group and youth who were ineligible in intakes 12 and 14

Variable	N	(1) Ineligible youth in intakes 12 and 14 Mean/SE	N	(2) Treatment group Mean/SE	t-test (2)-(1) Difference
Formal sector employment in last six months					
Baseline	224	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	224	0.183	102	0.412	0.229***
		[0.026]		[0.049]	
Difference	224	0.183	102	0.412	0.229***
		[0.026]		[0.049]	
Average weekly wage (Kina) #					
Baseline	224	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	224	60.045	102	123.255	63.210***
		[6.185]		[7.994]	
Difference	224	60.045	102	123.255	63.210***
		[6.185]		[7.994]	
Average number of hours worked in a week #					
Baseline	224	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	224	15.348	102	36.843	21.495***
		[1.528]		[2.545]	
Difference	224	15.348	102	36.843	21.495***
		[1.528]		[2.545]	
Earned cash in last four weeks					
Baseline	224	0.339	102	0.343	0.004
		[0.032]		[0.047]	
Endline	224	0.571	102	0.490	-0.081
		[0.033]		[0.050]	
Difference	224	0.232	102	0.147	-0.085
		[0.044]		[0.064]	
Sought job in last three months					
Baseline	224	0.094	102	0.147	0.053
		[0.020]		[0.035]	
Endline	224	0.192	102	0.324	0.132***
		[0.026]		[0.047]	
Difference	224	0.098	102	0.176	0.078
		[0.032]		[0.060]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Note: # in formal sector employment

Table A7: Differences in outcomes between youth in the treatment group and youth who were ineligible in intake 13

Variable	N	(1) Ineligible youth in intake 13 Mean/SE	N	(2) Treatment group Mean/SE	t-test (2)-(1) Difference
Formal sector employment in last six months					
Baseline	134	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	134	0.254	102	0.412	0.158***
		[0.038]		[0.049]	
Difference	134	0.254	102	0.412	0.158***
		[0.038]		[0.049]	
Average weekly wage (Kina) #					
Baseline	134	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	134	70.090	102	123.255	53.165***
		[8.114]		[7.994]	
Difference	134	70.090	102	123.255	53.165***
		[8.114]		[7.994]	
Average number of hours worked in a week #					
Baseline	134	0.000	102	0.000	0
		[0.000]		[0.000]	
Endline	134	18.754	102	36.843	18.089***
		[2.196]		[2.545]	
Difference	134	18.754	102	36.843	18.089***
		[2.196]		[2.545]	
Earned cash in last four weeks					
Baseline	134	0.321	102	0.343	0.022
		[0.040]		[0.047]	
Endline	134	0.604	102	0.490	-0.114*
		[0.042]		[0.050]	
Difference	134	0.284	102	0.147	-0.137*
		[0.053]		[0.064]	
Sought job in last three months					
Baseline	134	0.052	102	0.147	0.095**
		[0.019]		[0.035]	
Endline	134	0.179	102	0.324	0.144**
		[0.033]		[0.047]	
Difference	134	0.127	102	0.176	0.050
		[0.036]		[0.060]	

Standard errors in parentheses. * p< 0.10,** $p < 0.05$,*** $p < 0.01$.
Note: # in formal sector employment

11.4 List of Abbreviations

Active Labor Market Programs (ALMPs)

Labor Intensive Public Works Programs (LIPWs)

Papua New Guinea (PNG)

Urban Youth Employment Program (UYEP)

Gross Domestic Product (GDP)

United States Dollars (USD)

Youth Job Corps (YJC)

On-the-Job Training (OJT)

Basic Life Skills Training (BLST)

Ordinary Least Squares (OLS)

Standard errors (SEs)

Number of observations (N)

Bank of Papua New Guinea (BPNG)

United Nations Population Fund (UNFPA)