

Evaluation of formal education active labor market policy programs in slovenia with propensity score matching

Kavkler Alenka,
Faculty of Economics and Business, University of Maribor, Razlagova 14, Maribor, Slovenia
EIPF – Economic Institute, Einspielerjeva 6, Ljubljana, Slovenia

Abstract: In this paper, we evaluate the formal education active labor market policy programs in Slovenia during the great recession. The quasi-experimental method of propensity score matching is applied. Performance of active labor market policy programs is typically measured with the average treatment effect on the treated. In the short term, the programs do not reduce unemployment and are characterized by a high dropout rate or a high percentage of unsuccessful completions due to some problematic target groups.

Keywords: ACTIVE LABOR MARKET POLICY, UNEMPLOYMENT, PROPENSITY SCORE MATCHING.

1. Introduction

The aim of this study is to evaluate an important active labor market policy (ALMP) program in Slovenia, namely Formal education. The main question that should be answered by analyzing the efficiency of active labor market policy is whether ALMP measures reduce unemployment. Unemployment is the result of imbalances in the labor market, namely the differences between the supply of labor, which is determined by demographic and social trends, and demand for labor that stems from economic activity. The unemployment rate is, at least in the short term, determined by fluctuations in economic activity, since the labor supply is rather stable. ALMP measures that would effectively reduce unemployment should affect labor supply and/or demand.

The rest of this study is structured as follows. Section 2 describes the data and variables used in the study. Section 3 explains the methodological approach of propensity score matching. In Section 4, the results of evaluating the formal education programs are explained in detail. The implications of the empirical analysis are examined in the Section 5, Conclusion. The Data and Methodological approach sections are summarized from Kavkler (2019) and from Kavkler and Volčjak (2019).

2. Data

The data for the empirical investigation were obtained from the Employment Service of Slovenia (ESS). The first database (called US as abbreviation for unemployment spells) consists of all unemployment spells that ended between 1st January 2007 and 31st December 2010, as well as all of the ongoing spells on 31st December 2010. For each of the unemployment spells, the start and end date and the variables gender, age, level of education, occupation and statistical region were made available. Because ESS is not allowed to disclose personal data about the unemployed, only a personal ID number was added to enable identification of repeated spells. 411,338 unemployment spells with positive durations are included in this database.

The second database stores data about ALMP program participants in Slovenia in the period from 2007 to 2010. This database is called AL. In addition to the variables from the US database, AL also contains information about the type of ALMP program attended by the individual, source of financing and success of the individual at completing the program. From the initial 189,924 periods, the ALMP program ended in 166,166 cases. Since the ALMP program classification changed in 2007, the study only considers the 158,546 periods according to this classification. ALMP programs were successfully completed in 122,492 cases.

When estimating the models, the study used the following variables: employment status, age, gender, level of education, region, occupation and whether this is the first job. It is important to mention other variables that are often statistically significant in similar studies of other authors, for example health status, income, marital status and number of children. Unfortunately, we were not able to obtain the data on these variables for Slovenia.

3. Methodological Approach

A statistical method of matching is used to measure effectiveness of a treatment in a population. A subset of non-treated individuals is called the control group, whereas the set of treated individuals is called the experimental group (or treatment group). For applications of matching to the labor market, population is made up of all the unemployed in a given period of time, while the treatment group consists of all individuals participating in a specific ALMP program.

Performance of ALMP programs is typically measured with the average treatment effect on the treated (ATT) that is defined below. ATT simply put represents the difference between the expected probability of employment for the experimental group and the probability in the case that given individuals from experimental group would not have participated in ALMP. The second probability can only be approximately estimated. The first step involves logit or probit models with relevant explanatory variables to calculate the propensity for participation in the observed ALMP measure. In the second step, for each individual in the experimental group, one finds one or more persons in the control group with the same or at least a similar enough propensity for participation. With this subgroup of the control group the study estimated the probability needed for ATT.

4. Results

Table 1: description of the Formal education ALMP programs (based on the Catalogue of Measures of Active Employment Policy, Employment Service of Slovenia)

GOAL AND OBJECTIVE:
Increase employability and flexibility of unemployed individuals in the labor market, reduce structural mismatch in the labor market, and raise the educational and qualification levels of unemployed individuals
IMPLEMENTATION PROCEDURE:
Inclusion is carried out based on an employment plan. Formal education includes publicly recognized educational programs that run throughout the vertical from primary school to undergraduate education. Participants who successfully complete the program obtain a publicly recognized formal education.
TARGET GROUP:
<ul style="list-style-type: none"> • Unemployed individuals who received education under an employment plan according to Article 53b of the Employment Relationship Act in the school year 2009/2010; • Unemployed individuals without professional or vocational education; • Unemployed individuals with health limitations; • Individuals whose employment relationship ended as redundant workers due to business reasons, bankruptcy, liquidation of the employer, or compulsory settlement and had a contract with the employer for education (in this case, the remaining costs of the education program are covered);

- Unemployed individuals with professional or vocational education in fields in which they cannot find employment that have been registered with the Employment Service of Slovenia for more than one month, with an emphasis on eliminating regional structural mismatches in the labor market.
- Unemployed individuals over 45 years of age.

DURATION OF INCLUSION: The duration of education or inclusion of an individual depends on the type of education in which the individual is enrolled and their prior knowledge, abilities, and skills.

As the effects of formal education often manifest in the long term, we selected 1,348 formal education programs that started in 2007 as the basis. The histogram for the length of these programs, shown in Figure 1, shows that most of them (909) last up to 1 year, and the longest program was supposed to last more than 4 years and end in 2011, but it is unfortunately not in our database. We selected 519 out of a total of 909 education programs lasting up to 1 year for the experimental group, in which unemployment also began in 2007. The control group consists of individuals enrolled in vocational education in 2007 who did not participate in any of the active employment policy programs. The control group, as defined, includes 37,082 individuals.

When studying the experimental group, we noticed an unusually high percentage of unsuccessful completions. As shown in Table 1, only 56.8% of the participants successfully completed the programs, approximately 9% interrupted the education, and slightly over 32% completed it unsuccessfully (11.95% for justifiable reasons, and 20.42% for unjustifiable reasons). We suspect that the reason for such a high percentage of unsuccessful completions is due to certain problematic target groups, such as unemployed persons with health limitations and unemployed persons over the age of 45 who probably have not received any education for at least 20 years. Unsuccessful completions due to justifiable reasons are probably a result of medical certificates, so we assume that the percentage of people with health limitations in the experimental group is significant. Figure 2 shows the success rate for completions for the entire ALMP database (top figure) as well as for formal education programs (bottom figure). The ALMP database shows a 65% success rate for completions, taking into account that approximately 12% of programs were still ongoing at the beginning of the study, so there were no data on their success rate. For formal education programs as a whole, the success rate for completions is 42%, with approximately 20% unsuccessful. Some programs were not yet completed when our study ended.

The results of calculations at the end of the years 2008, 2009, and 2010 are presented in Table 3 below. The calculations were performed with R software (Sekhon, 2011). The values for ATT are negative and statistically significant in all three cases. In the short term, negative results can be expected from education because this program has a pronounced "locking-in" effect. In the long term, some foreign studies show positive results, but the target group is usually selected from all unemployed individuals. At the end of 2010, 67.24% of individuals in the experimental group were removed from the US database, and there were 9.53% more such individuals among those paired in the matching process (because ATT is -0.0953), or 76.77%. At the end of 2009, 65.13% of the experimental group were not among the registered unemployed, and at the end of 2008, this proportion was the same at 67.24%. The corresponding proportions for the matched control group are

obtained by subtracting ATT from the proportion for the experimental group.

It should be noted that the calculation of ATT is biased because we do not have data on the health status of the experimental and control groups. To ensure unbiased calculation in the matching method, all variables that affect both enrollment in the ALMP program and the success of the program (i.e., removal from registered unemployment) must be controlled. Unbiased calculation could be achieved with data on some indicators of health status, such as the number of visits to a doctor by an individual in the observation period or expenditures from the health insurance fund. Currently, the obtained ATT values are too low because in the matching process, individuals with health limitations in the control group should be paired with those who also have health limitations. In any case, it would be good to reconsider the rationale for some target groups, which contribute to the high proportion of unsuccessful completions.

Figure 1: histogram for the length of formal education programs that began in 2007 (in years)

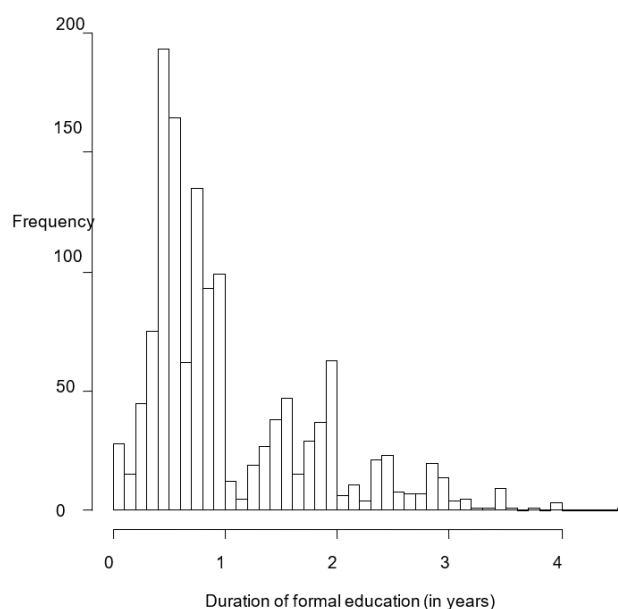
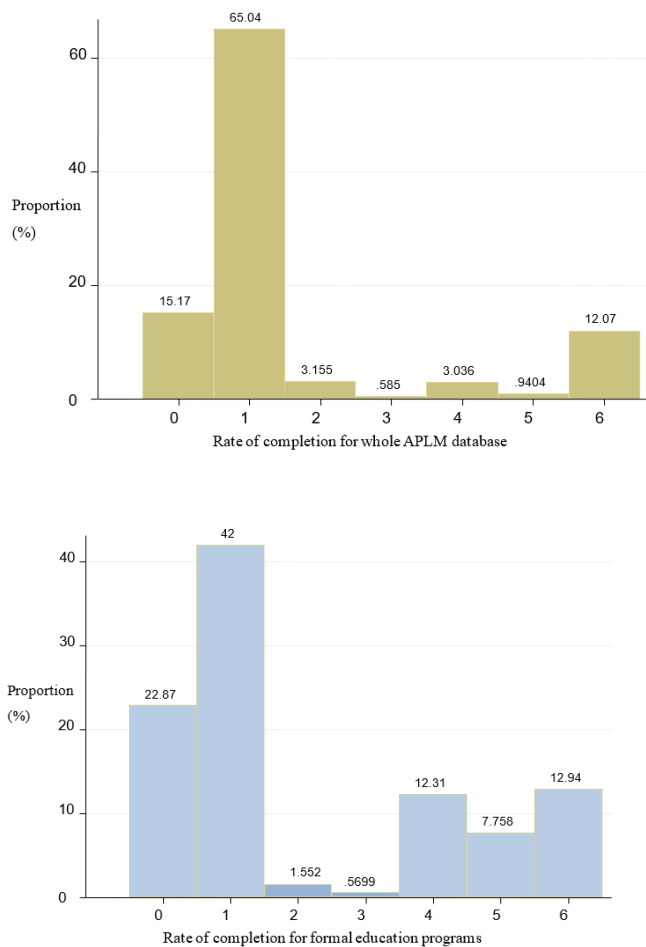


Table 2: Rate of completion of education for the experimental group (in %)

No data	0.77
Successfully completed activity	56.84
Interruption of activity - justifiable reasons	6.94
Interruption of activity - unjustifiable reasons	2.31
Unsuccessfully completed - justifiable reasons	11.95
Unsuccessfully completed - unjustifiable reasons	20.42
No entry for success rate	0.77

Figure 2: Rate of completion for the entire ALMP database (upper image) and for formal education programs (lower image)



Legend: 0: No data, 1: Successfully completed activity, 2: Interruption of activity - justifiable reasons, 3: Interruption of activity - unjustifiable reasons, 4: Unsuccessfully completed activity - justifiable reasons, 5: Unsuccessfully completed activity - unjustifiable reasons, 6: No entry for success rate.

Table 3: ATT calculations

	At the end of 2008	At the end of 2009	At the end of 2010
ATT	-0,1089	-0,11247	-0,0953
AI SE	0,0234	0,022817	0,0224
t-stat	-4,6618	-4,9294	-4,2486
p-value	0,0000	0,0000	0,0000

Note: AI SE represents the standard error using the method developed by Abadie and Imbens (2006).

Formal education as an active labor market policy program has been studied by other authors. Domadenik and Pastore (2006) analyze

youth unemployment in two former transition economies, Slovenia and Poland. The authors apply the multinomial logit model and argue that tertiary education lowers the probability of unemployment, especially for the young adults.

Južnik-Rotar (2008, summarized from Martin and Grubb, 2001) claims that empirical research that has investigated the effectiveness of education active labor market policy programs using a microeconomic approach has shown that such programs have a very low positive impact on the likelihood of further employment and potential earnings of program participants. Therefore, state interventions must be appropriately designed if we want to achieve greater employment opportunities for program participants and greater cost-effectiveness. Klužer (2008), on the other hand, estimates the effectiveness of active labor market policy programs with a macroeconomic approach, namely with an augmented matching function.

Caliendo and Schmidl (2016) examine youth unemployment in European countries that spend significant resources on active labor market policy programs for the young unemployed. According to the authors, a smaller part of training active labor market policy programs are »preparatory programs that promote the take-up of regular formal education, such as the continuation of general schooling, or participation in apprenticeship-based vocational education.«

5. Conclusion

Educational active labor market policy programs consist of Formal education programs and Project-based learning for young adults. These are typical attempts to reduce structural unemployment, increase employability, and flexibility on the supply side of the labor market. In the short term, the programs do not reduce unemployment; the first program is characterized by a high dropout rate or a high percentage of unsuccessful completions enrolled in formal education, and reducing unemployment is not the only goal of the project-based learning program for young adults. We assume that the reason for such a high percentage of unsuccessful completions of formal education is in some problematic target groups, such as unemployed persons with health limitations and unemployed persons over 45 years of age who have probably not been in education for at least 20 years. Unsuccessful completions due to justifiable reasons are likely a result of medical certificates, so we conclude that the percentage of persons with health limitations in the experimental group is not negligible. It would be wise to reconsider the relevance of certain target groups, which is why this program has such a high percentage of unsuccessful completions.

References

1. Abadie, A., Imbens, G. (2006). Large Sample Properties of Matching Estimators for Average Treatment Effects. *Econometrica* Vol. 47: 235-267.
2. Caliendo, M., Schmidl, R. Youth unemployment and active labor market policies in Europe. *IZA J Labor Policy* 5, 1 (2016).
3. Domadenik P., Pastore, F. (2006). The impact of education and training systems on the labour market participation of young people in CEE economies: A comparison of Poland and Slovenia. *International Review of Entrepreneurship & Small Business*, 3(1): 640-666.
4. Employment Service of Slovenia (ESS) (2010). Catalogue of Active Labour Market Policy Measures.
5. Južnik-Rotar, L. (2008). Vključevanje mladih brezposelnih oseb v aktivne politike zaposlovanja. *Naše Gospodarstvo*, 54(1-2): 112-119.

6. Kavkler, A. (2019). Evaluation of work trial programs, verification and validation of national vocational qualification in Slovenia during the great recession with propensity score matching approach. In: Schaefer, T. M. (ed.). *Innovations in the modern world: monograph SEPIKE*. Poitiers (etc.): Association 1901 "SEPIKE", p. 70-79.
7. Kavkler, A., Volčjak, R. (2020). Effectiveness of active employment policy programs in European countries before the great recession. *IOSR journal of economics and finance: IOSR-JEF*. Vol. 2020 (1): 13-18.
8. Kluve, J. (2006). The Effectiveness of European Active Labor Market Policy. *IZA Discussion Paper*, No. 2018.
9. Klužer, F. (2008). Ocena učinkovitosti aktivne politike zaposlovanja z združevalno funkcijo. *IB Revija*, **42**(2): 17-27.
10. Martin, J., Grubb, D. (2001). What Works and for Whom: A Review of OECD Countries' Experiences with Active Labour Market Policies. *Swedish Economic Review* 8: 9-56.
11. Sekhon, J.S. (2011). Multivariate and Propensity Score Matching Software with Automated Balance Optimization: The Matching package for R. *Journal of Statistical Software* Vol. 42 (7).