Employing the unemployed of Marienthal: Evaluation of a guaranteed job program

PRE-ANALYSIS PLAN

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1 Background

1.1 Description of the intervention

Starting in October 2020, the Public Employment Service ("Arbeitsmarktservice" or AMS) for Lower Austria (Niederösterreich) is piloting an intervention that aims to erradicate long-term unemployment and improve social, health and wellbeing outcomes for people in long-term unemployment, by bringing them back into employment. The intervention will provide a guaranteed job complemented by targeted counseling to support people in long-term unemployment.

The intervention will take place in one town in Lower Austria, Gramatneusiedl. All residents who have been unemployed for over 9 months are eligible to participate. The initial period for the project is set until 2024 and budgeted with EUR 7.4 Million for the full duration. The AMS calculates that the annual cost of the intervention is EUR 29,841.39 per participant.

Preparatory training The program is implemented by the private service-provider *itworks*, which specializes in implementing active labour market programmes for the AMS. *itworks* provides preparatory training for participants, and continues counseling and training after participants have taken up employment. The preparatory training phase is scheduled for two months, but durations may vary depending on individual conditions and progress. Each participant receives a tailored curriculum according to their individual needs. This may include individual and group counseling, skills development, supporting self-initiative, and assistance with health-related problems. Participants will continue to be encouraged to take up regular employment outside of the program if available.

Guaranteed jobs After successful completion of the preparatory training phase, participants join the job guarantee program for up to 3 years. Depending on availability, participants are either offered a job on the regular labor market, or receive an employment offer with a newly established social enterprise operated by *itworks*. For jobs on the regular labor market, the AMS subsidizes wage costs at a 100% rate for the first 3 months, and at 2/3 for the subsequent 9 months. The social enterprise implements projects at the municipal and regional level. Tasks may include activities such as working in childcare, gardening, renovation, and carpentry depending on orders acquired by the enterprise. Through its business activities, the enterprise is expected to generate revenues of around EUR 383,000 over the project duration. In addition, participants are supported to develop and propose their own ideas for projects based on their expertise and local knowledge.

A specific effort is made to create productive and meaningful employment that is adequate to the participants' previous jobs in terms of skills and income. The jobs created are tailored to the needs of the recipients. Persons with limited work availability receive targeted job offers. A person only available to work part-time receives a corresponding part-time offer. A person who can carry out only a limited number of tasks (e.g. for health reasons) similarly receives a corresponding offer. Social workers and instructors continue to provide support to employees of the social enterprise as needed. Participants have access to occupational physicians. Those participants that feel ready to work for third-party employers receive targeted support and additional counseling to apply and find employment outside of the program.

Voluntary participation Work conditionality is eased. Currently, under law ALVG §9, people in unemployment are assigned to labour market programs by the AMS. They have the obligation to participate and they have to accept an employment offer that conforms to their skillset and that offers a similar salary to their previous job (not less than 80%). By contrast, within the job guarantee program only participation at the information event and the preparatory training phase is subject to this conditionality, while take-up of employment offered as part of the job guarantee is voluntary (i.e.. without sanctions in case a job offer is declined).

1.2 Timeline for the intervention

- October 2020: Targeted curriculum and coaching starts; (first 31 participants).
- December 2020: Intended start of employment (first 31 participants).
- February 2021: Targeted curriculum and coaching starts; (second group of 31 participants).
- April 2021 Intended start of employment (second group of 31 participants). The treatment continues for (at least) 3 years up to March 2024.

A complementary study conducted by researchers at the Department of Sociology, University of Vienna will use a mixed-methods design and qualitative in-depth interviews, including longer-term follow ups.

1.3 Impact of the COVID-19 pandemic

Due to the COVID-19 pandemic, labor market conditions have worsened in Lower Austria, including Gramatneusiedl. The trajectory of Gramatneusiedl was similar to comparable municipalities as indicated in the synthetic control comparison. All individuals included in our treatment and control groups for the pairwise matching have become unemployed before the pandemic. However, their opportunities to find employment since have been severely impacted. Entrants into the job guarantee scheme at a later stage - relevant for the synthetic control comparison - will include those who became unemployed during the pandemic.

The implementation and timeline of the job guarantee pilot were not affected, and the pilot continues as planned. We plan to take specific precautionary measures during the fieldwork and data collection to guarantee the safety of participants and researchers involved.

2 Study design

2.1 Overview

Our evaluation of the job guarantee program is based on two complementary study designs. The first design uses pairwise randomization within pairs of participants matched using baseline covariates; cf. Athey and Imbens (2017). Participants are assigned to one of two waves, where the second wave starts the program 4 months after the first one. This allows us to estimate (short-term) effects of the program by comparing participants across the two waves, around 3-4 months from the start of the first wave.

The second design uses the synthetic control method; cf. Abadie et al. (2010). We construct a synthetic control town for Gramatneusiedl, based on other towns in the province of Lower Austria. The synthetic control town is a convex combination of similar towns. This method allows us to estimate effects of the program at the town level, including potential spillovers on non-eligible residents.

The code implementing the following designs has been uploaded to GitHub, at `https://github.com/maxkasy/Marienthal`. For the matched pair design, we use the package *nbpMatching* in R, for the synthetic control design we use the package *Synth*.

2.2 Sample selection

The set of participants who are eligible for the job guarantee program includes all current residents of Gramatneusiedl who are long-term unemployed, where "long-term" means an unemployment spell exceeding 9 months. The definition of unemployment used here ("langzeitbeschäftigungslos") includes individuals who have participated in active labor market programs of the AMS and those who have attempted to take up employment but were employed for less than 28 days within the last 9 months.

The set of municipalities used to construct our synthetic control municipality includes all municipalities in the province of Lower Austria.

2.3 Assignment of participants to waves

As noted above, we assign program participants to one of two waves using pairwise randomization, where pairs are matched using a number of covariates. These covariates include the following, which were constructed from the raw data provided by the AMS: Gender, age, "migration background" (being a migrant or child of migrants), education (more than "Pflichtschule," the legally required minimum), presence of a disability or health condition recorded by AMS, the level of benefits most recently received (closely correlated with prior income), and the number of days recorded as unemployed and looking for a job in the last 10 years. All of these variables are used as available to the AMS at the latest available date in September 2020. These data have been recorded at the last prior interaction between each of the participants and the AMS.

Pairwise distances between all 62 program participants are calculated using the Mahalanobis distance[1] based on these covariates. Participants are matched into pairs such that the total sum of distances between the members of each matched pair is minimized. One of the participants in each pair is then randomly selected to start the program in wave 1, while the other participant is assigned to wave 2.

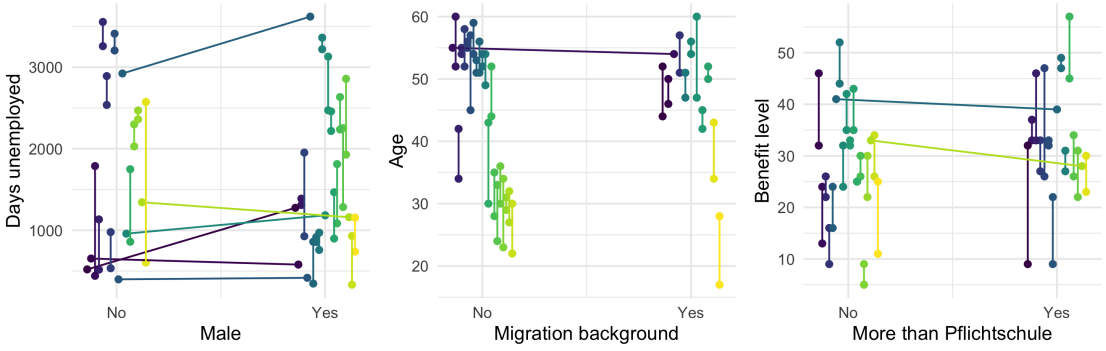
[1]The Mahalanobis distance of two covariate vectors x_1 and x_2 that are realizations of a random vector X is given by $d(x_1, x_2) = \sqrt{(x_1 - x_2) \cdot Var(X)^{-1} \cdot (x_1 - x_2)}$.

Summarizing the resulting assignment, Table 1 shows the differences in covariate means between waves, and the corresponding t-statistics. Confirming that our procedure worked as intended, all available covariates are balanced across waves. Providing a more disaggregated representation of the matching, Figure 1 depicts the matched pairs in terms of the different covariates characterizing participants.

Table 1: Covariate balance for our matched pair design

Covariate	Mean wave 1	Mean wave 2	Difference	T-statistic	P-value
Male	0.581	0.581	0.000	0.000	1.000
Age	44.452	44.935	-0.484	-0.165	0.869
Migration Background	0.323	0.355	-0.032	-0.264	0.793
Education	0.452	0.452	0.000	0.000	1.000
Health condition	0.290	0.323	-0.032	-0.271	0.787
Benefit level	29.839	29.839	0.000	0.000	1.000
Days unemployed	1721.871	1600.839	121.032	0.483	0.631

Figure 1: Matched pairs



2.4 Construction of the synthetic control

We next turn to our second approach, constructing a synthetic control municipality for Gramatneusiedl. For the construction of this control municipality we draw on data from various sources, including the AMS internal registry ("Arbeitsmarktdatenbank"), the social security registry (via "AMS BMAFJ Erwerbskarrierenmonitoring" or AMDB), and the national statistical agency ("STATcube - Statistische Datenbank" of Statistik Austria).

We construct a synthetic control municipality in two steps. In the first step, we select a subsample of 5% of the available municipalities (26 out of 505 municipalities) which are most similar (closest) to Gramatneusiedl. Similarity is measured in terms of the Mahalanobis distance in covariate space. The covariates used are listed in Table 3 below. All covariates are based on observations for the year 2019 (as measured in December). Additionally, we also include some indicators measured in July of 2020, after the onset of the Covid pandemic, to account for possibly heterogeneous impacts of this pandemic. These covariates are shown in the last panel of Table 3.

In the second step, we construct a synthetic control based on these 26 municipalities, using the approach described in Abadie et al. (2010) and reviewed in Abadie (2019). This synthetic control is chosen to match the same list of covariates used in the first step (where we selected a subsample of municipalities), as well as additionally the trajectory of unemployment rates (share unemployed among the working age population) in Gramatneusiedl from 2011 to 2020, that is, for the 10 years preceding the intervention.

The resulting weights are shown in Table 2, which lists all municipalities with non-negligible weights. The time series of the predicted unemployment rate using the synthetic control, and the corresponding realized time series of unemployment for Gramatneusiedl in the 10 years preceding the intervention are shown in Figure 2. Table 3 compares the covariate values for Gramatneusiedl with those for the synthetic control as well as those for each of the municipalities with positive synthetic control weights.

Variable definitions The variables used to select similar municipalities and to construct the synthetic control, as shown in Table 3, are defined as follows: The number of unemployed as a share of the working age population, long term unemployed as a share of the working age population, the working age population, the inactive population as a share of the working age population, the mean age of the population, the share of small firms (less than 10 employees), the share of medium sized firms (10-249 employees), the share of the population with low education (ISCED 1-2), the share of the population with medium education (ISCED 3-4), the share of men in the population, the share with migrant background in the population, the share of the population with care responsibilities, the mean wage level, the mean age of the unemployed, the share of the unemployed with low education (ISCED 1-2), the share of the unemployed with medium education (ISCED 3-4), the share of the unemployed with low German skills (less than A2 CEFR), the share of male among the unemployed, the share of the unemployed with migrant background, the share of the unemployed with an underlying health condition limiting employment opportunities, and the communal tax per working age population.

Table 2: Synthetic control weights

Weight	Municipality	Identifier
0.487	Ebreichsdorf	30607
0.203	Zeillern	30544
0.134	Rußbach	31224
0.079	Leopoldsdorf im Marchfelde	30831
0.046	Strasshof an der Nordbahn	30856
0.024	Sieghartskirchen	32131
0.023	Sollenau	32327

Figure 2: Synthetic control gap

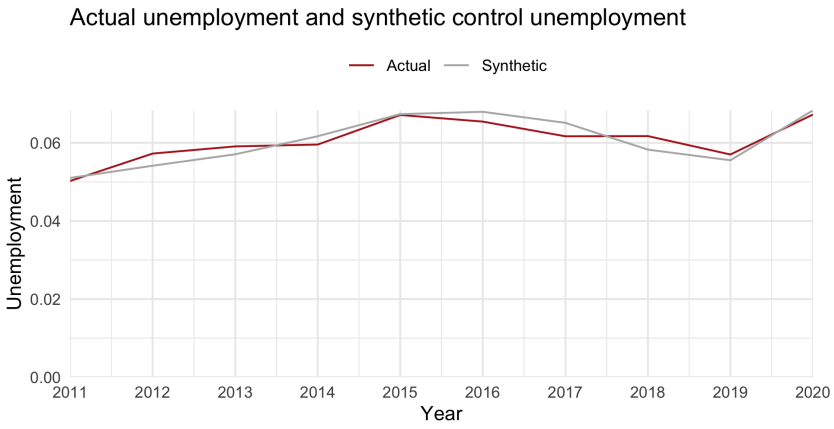


Table 3: Gramatneusiedl and control municipality covariates

Gemeinde	Working age pop	Long term unemp/pop	Inactive/pop	Mean age	Share small firms	Share mid firms	Share low edu
Gramatneusiedl	5013	0.007	0.220	50.775	0.115	0.339	0.208
Synthetic control	4830	0.016	0.228	51.074	0.126	0.363	0.225
Ebreichsdorf	7655	0.020	0.228	50.810	0.139	0.381	0.235
Zeillern	1263	0.004	0.227	50.229	0.093	0.335	0.199
Rußbach	942	0.013	0.219	52.230	0.126	0.369	0.206
Leopoldsdorf im Marchfelde	2035	0.022	0.247	51.304	0.135	0.348	0.242
Strasshof an der Nordbahn	6920	0.024	0.213	51.403	0.115	0.324	0.250
Sieghartskirchen	4560	0.010	0.224	52.464	0.135	0.337	0.197
Sollenau	5122	0.017	0.248	54.286	0.129	0.360	0.284

Gemeinde	Share mid edu	Share men	Share migrant	Share care resp	Mean wage	Mean age unemp	Low edu/unemp
Gramatneusiedl	0.642	0.511	0.242	0.257	3416	42.694	0.530
Synthetic control	0.644	0.503	0.181	0.235	3293	43.422	0.452
Ebreichsdorf	0.620	0.498	0.234	0.235	3379	44.344	0.465
Zeillern	0.702	0.509	0.053	0.256	3168	40.462	0.346
Rußbach	0.676	0.513	0.088	0.224	3137	45.500	0.525
Leopoldsdorf im Marchfelde	0.619	0.498	0.260	0.216	3294	43.627	0.513
Strasshof an der Nordbahn	0.600	0.496	0.276	0.257	3393	42.364	0.465
Sieghartskirchen	0.641	0.510	0.195	0.206	3366	41.257	0.387
Sollenau	0.608	0.496	0.229	0.193	3235	41.819	0.521

Gemeinde	Mid edu/unemp	Poor German/unemp	Men/unemp	Migrant/unemp	Health cond/unemp	Communal tax/pop	Lt ue/pop 2020
Gramatneusiedl	0.455	0.082	0.627	0.418	0.245	57.281	0.009
Synthetic control	0.516	0.061	0.583	0.312	0.264	217.301	0.018
Ebreichsdorf	0.480	0.086	0.546	0.374	0.213	282.242	0.022
Zeillern	0.654	0.000	0.692	0.115	0.303	97.822	0.004
Rußbach	0.475	0.025	0.575	0.200	0.375	97.079	0.016
Leopoldsdorf im Marchfelde	0.473	0.093	0.573	0.467	0.256	284.806	0.023
Strasshof an der Nordbahn	0.496	0.089	0.528	0.472	0.303	160.549	0.027
Sieghartskirchen	0.552	0.054	0.609	0.360	0.281	329.855	0.012
Sollenau	0.460	0.140	0.558	0.457	0.282	308.998	0.019

2020

Gemeinde	Inactive/pop	Mean wage	Mean age ue	Low edu/ue	Mid edu/ue	Poor German/ue	Health cond/ue
Gramatneusiedl	0.209	3308	42.069	0.456	0.481	0.031	0.209
Synthetic control	0.219	3181	42.625	0.389	0.577	0.059	0.212
Ebreichsdorf	0.217	3278	43.101	0.424	0.527	0.082	0.169
Zeillern	0.222	3025	41.474	0.289	0.711	0.000	0.193
Rußbach	0.208	3022	42.314	0.343	0.629	0.057	0.349
Leopoldsdorf im Marchfelde	0.244	3222	44.021	0.472	0.507	0.056	0.225
Strasshof an der Nordbahn	0.202	3264	41.188	0.458	0.493	0.061	0.260
Sieghartskirchen	0.220	3241	43.406	0.319	0.626	0.043	0.278
Sollenau	0.238	3071	41.847	0.460	0.517	0.119	0.274

3 Estimation and inference

3.1 Outcomes of interest

We will estimate the effect of program participation on a range of economic and social outcomes. To assess the main objective of the intervention - to eradicate long-term unemployment - we will use labor market status as our primary outcome; for participants in the experimental study, and for other residents of Gramatneusiedl in the synthetic control study. Additionally, we will estimate the treatment effect on income.

To assess secondary objectives such as improving social, health and wellbeing outcomes, we will estimate the treatment effect on physical and psychological health, material deprivation, well-being, social inclusion, the participant's general condition (including appearance, hygiene, time management) and employment-related skills. Additionally, we will consider outcomes correlating to social capital, such as trust in society and institutions, civic engagement as well as attitudes towards the welfare state, migration, and environmental protection.

We will collect data on these secondary outcomes by surveying the experimental participants in both the treatment and control groups, as well as the program instructors. We will use multi-item scales to construct one composite index for each of the secondary outcomes. We will register the full questionnaire and methodology for constructing the composite indices before running the first survey.

3.2 Inference for the pairwise randomized sample

Randomization inference Our approach toward inference is based on permutations of treatments, that is, based on randomization inference. This approach allows us to test the null hypothesis that the intervention had no effect of any kind, that is, $Y_i^1 = Y_i^0$ for all individuals i and potential outcomes Y_i^1, Y_i^0.

We re-assign treatment at random *within* (!) each of the matched pairs of participants. For this counterfactual treatment assignment, we re-calculate any given test-statistic. Repeating this process many times, we can calculate the share of re-assignments for which the test-statistic is bigger than the realized value of the test-statistic. This share is the p-value for the null hypothesis of no effects.

Compound hypotheses In order to deal with the issue of multiple testing in a principled manner, we will use the Benjamini–Hochberg procedure, which allows us to control the false discovery rate, that is, the share of rejected hypotheses which in fact hold true.

This procedure works as follows. Sort the p-values, for each of the m hypotheses, tested by size, resulting in ordered values $P_{(j)}$. For a critical value α, find the largest value k such that

$$P_{(k)} \leq \frac{k}{m}\alpha.$$

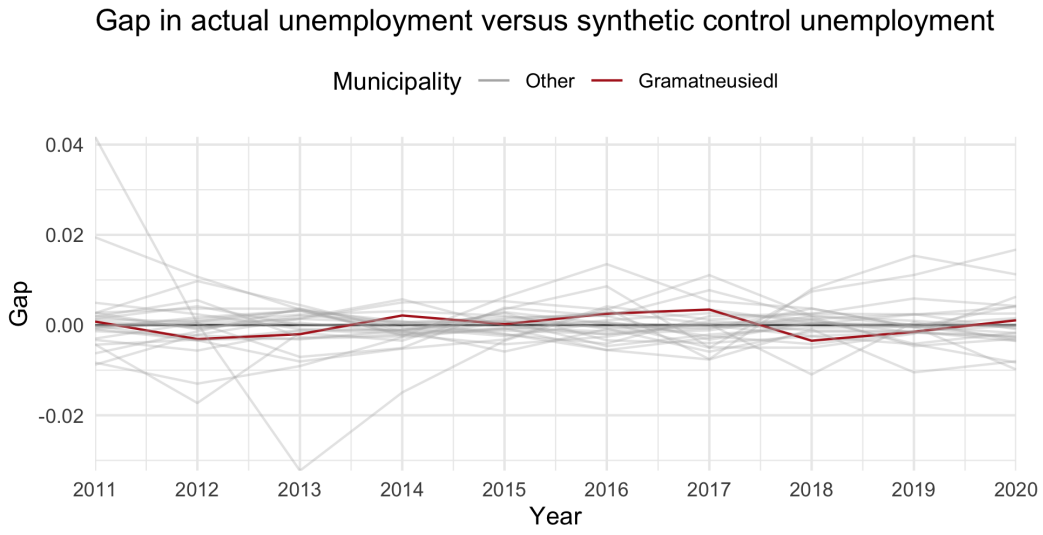
Reject the null hypothesis for all $i = 1, \ldots, k$.

3.3 Permutation inference for the synthetic control

Our inference for the synthetic control method relies on the permutation approach as described in Abadie et al. (2010). We consider Gramatneusiedl and each of the 25 control municipalities based on which the synthetic control for Gramatneusiedl was constructed. For each of these, we calculate a synthetic control based on the other 25 municipalities, and use this synthetic control to predict outcomes in the post-intervention period. The share of these municipalities for which the resulting gap between realized and predicted outcomes is larger than for Gramatneusiedl can then be interpreted as a p-value for the null-hypothesis that the intervention had no effect on the outcome for Gramatneusiedl.

Figure 3 shows the time series of gaps between realized and predicted outcomes for Gramatneusiedl and for the control municipalities during the 10 years before the intervention. As can be seen from this figure, Gramatneusiedl is not an outlier during this pre-period.

Figure 3: Permutation inference for the synthetic control



4 Publication agreement

This evaluation is based on an agreement between the researchers (us, Lukas Lehner and Maximilian Kasy) and the AMS NÖ. Two key components of this agreement are that (1) no payment will be made from the AMS NÖ to the researchers, and (2) the researchers are guaranteed to be entitled to publish the findings of their study in academic outlets without any interference by the AMS NÖ. The AMS NÖ in turn retains the right to disseminate the findings to the wider public, including to news outlets and social media.

5 IRB approval

The experimental work described in this pre-analysis plan was reviewed and approved by the Departmental Research Ethics Committee at the Department of Economics, University of Oxford.

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