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## Testing the Welfare Magnet Hypothesis

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# The Impact of Welfare Benefits on the Location Choice of Refugees
# Testing the Welfare Magnet Hypothesis

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February 10, 2021

**Abstract**

This paper analyzes the influence of welfare benefit levels on migrants' location choices within their host country and thus provides a rare empirical test of the Welfare Magnet Hypothesis. In Austria, asylum seekers are distributed across federal states according to a quota, but once they are granted protection, they are free to move wherever they want. Welfare benefit levels for refugees vary over states depending on a person's protection status and - due to a series of welfare benefit reforms at the state level - over time. This institutional structure allows to causally identify the effect of welfare benefit differentials on refugees' first autonomous location choice. We employ two complementary identification strategies, the first is based on variation over states and protection-status groups. The second is based on the welfare reforms at the state level and exploits variation over states, groups and time. The results provide evidence in favor of the Welfare Magnet Hypothesis.

***Keywords***— The Welfare Magnet Hypothesis, Refugees, Natural Experiment

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# 1 Introduction

The regional dispersion of immigrants in their host country is highly policy relevant. A high concentration of immigrants in only a few places might increase integration challenges in terms of housing and public goods provision and fail to provide a demographic boost to the regions most in need of one. Nonetheless the clustering of immigrant populations in only a few locations is one of the most salient stylized facts uncovered in international migration research (Bartel, 1989; Chiswick and Miller, 2005; Massey et al., 1993). A number of contributions have thus aimed to identify the factors influencing immigrants' location choices within a host country. This research suggests that the labor market prospects of immigrants in the receiving region as well as the presence of social networks and ethnic communities are the most important determinants driving this stylized fact (Zavodny, 1997; Damm, 2009; Tanis, 2018).

According to the so called welfare magnet hypothesis (see Borjas, 1999, for a seminal contribution), however, also the generosity of a region's welfare system may be a cause of immigrant clustering as new immigrants will be disproportionately drawn to locations with high welfare benefit levels. This hypothesis has had an important impact on policy, as concerns over potential welfare magnets have repeatedly persuaded policy makers to limit immigrants' access to welfare (Zavodny, 1997). Testing its empirical validity has, however, proven to be complicated due to the potential self-selection of migrants and the host of further confounding factors impacting on location choices (Levine and Zimmerman, 1999; Zavodny, 1997; Borjas, 1999; Kaushal, 2005). Previous empirical research has generated mixed results. For the EU, De Giorgi and Pellizzari (2009) provided evidence of small but non-negligible welfare effects on location choice of EU-migrants whereas Giulietti et al. (2011) do not find any effects. Similarly, among quasi-experimental studies Kaushal (2005) for the US, using evidence from the implementation of the Personal Responsibility and Work Opportunity Reconciliation Act, finds that changes in welfare benefits at the state level do not affect location decisions within the US of newly arrived low-skilled immigrant women. By contrast, Agersnap et al. (2019), analyzing the impact of welfare cuts on refugee immigration to Denmark in 2015, do find a statistically significant effect.

This paper contributes to this literature by providing a quasi-experimental analysis of the effect of within-country welfare benefit level differentials on immigrants' location choices. We focus on refugee migration within Austria, as a country that was heavily affected by the refugee migration of 2015 and use two complementary strategies to identify the effects of welfare benefits on the location choice of refugees. These exploit an administrative rule that randomizes the distribution of asylum seekers and differences in the eligibility for welfare benefits between two groups of refugees, who differ by protection status (asylum or subsidiary protection[1]) across the nine Austrian federal

[1]Refugees with asylum (asylees) are granted protection according to the Geneva Convention whereas subsidiary protection is derived from the European Convention on Human Rights. For details see the next section.

states. The first identification strategy utilizes the fact that in some states one of the two groups, the subsidiary protected, are excluded from regular welfare benefits. The second exploits three state level welfare benefit reforms that exclusively affected either refugees with asylum or with subsidiary protection.

We analyze the first autonomous migration choice of refugees in the months after they were granted protection. At this point in time refugees have to leave the refugee camps for asylum seekers and are suddenly exposed to sizeable differences in regional benefit levels. In the cases we study a refugee with subsidiary protection in a state with low benefit levels can increase her benefits by at least 50% and up to 1.7 fold by moving to a high welfare state (our first treatment). A refugee with asylum affected by the welfare reforms can increase her benefit income by approximately 50% when moving (treatment 2). At this point in time also welfare dependence among refugees is high, in part due to them only gaining full access to the labor market and integration programs after their status has been recognized. Further, by considering only refugees who were registered as employment seekers at least once since receiving protection, we ensure that we focus on a subgroup that is particularly likely to depend on welfare. This group is therefore also likely to be highly motivated to migrate due to welfare benefit differences.

Both identification strategies show significant effects of welfare benefit levels on the propensity to move of the considered refugees. According to our estimates emigration rates among the subsidiary protected are approximately 11 percentage points higher in states that grant them lower benefit levels. The reforms of welfare benefits in individual states led to larger increases in the out-migration rates of the affected groups with the exception of Burgenland, where out-migration of the affected group actually decreased after the reform.

The remainder of the paper is structured as follows. Section 2 describes the institutional setting of the reception and accommodation system for refugees, which results in their random dispersion as well as the welfare system as it applies to refugees in Austria. The next sections then turn to the methods and data used for this paper and present results. Section 6 discusses how our findings align with the welfare magnet hypothesis and concludes.

## 2 Refugees in Austria

In recent years, Austria has witnessed a sharp but temporary rise in the number of refugees arriving from war-ridden Middle East, a large proportion of which have been granted asylum. From 2014 to 2017, about 180.000 people asked for asylum in Austria and about 83.000 people received either asylum or subsidiary protection (BMI, 2018, 2017, 2016, 2015)[2]. Upon arriving in Austria, asylum seekers are first accommodated in federally run reception centers. Subsequently, a coordinating body at the ministry of the interior assigns refugees into the care of a federal state according to a quota that aims

[2]Since the peak in 2015, the number of new arrivals in Austria has plummeted from 88,340 to 12,886 in 2019.

for a distribution of refugees that is proportional to the state's population size (Grundversorgungsvereinbarung - Art. 15a B-VG, 2004). There, they are accommodated in privately or NGO-run facilities that provide some minimum standards in terms of housing and they receive some monetary or in kind assistance for food and clothing.[3] An individual refugee has no influence on the state to which he or she is assigned. Also leaving the assigned state is difficult as it usually involves losing access to basic subsistence support, something asylum seekers cannot afford given that their labor market access is heavily restricted.

Asylum seekers, whose claim for international protection is found justified, are awarded either the full protection status asylum in accordance with the Geneva convention or the status subsidiary protection if their lives would be in danger upon returning to their home countries but they are not prosecuted on the grounds protected by the Geneva convention. After being granted either asylum or subsidiary protection, both groups gain freedom of movement within Austria and full access to the labor market. Refugees with asylum, henceforth asylees, lose access to basic subsistence support four months after receiving protection and have to leave the refugee camps where they lived so far. Just as Austrian citizens, they become eligible for needs based minimum income support (Bedarfsorientierte Mindestsicherung in German), if they do not have a job and do not own meaningful property. The baseline level of minimum income support for single households was €837.76 in 2016 - roughly 85% of the Austrian minimum pension.[4]

Refugees with subsidiary protection, henceforth the subsidiary protected, by contrast, continue to have access to basic subsistence support and could thus also remain in the refugee camps. However, life in the camps is usually difficult, conditions are crowded, many camps' location is remote and monetary benefits for those on basic subsistence support are only about €200 for food and transport each month. Subsidiary protected are listed as eligible for minimum income support in the federal accord Bedarfsorientierte Mindestsicherung - Art. 15a B-VG (2010). Nonetheless eligibility for minimum income support has been restricted by some federal states. Styria and Burgenland do not grant minimum income support to people eligible for basic subsistence support (Steiermärkisches Mindestsicherungsgesetz, 2011; Burgenländisches Mindestsicherungsgesetz, 2010), thus effectively blocking the subsidiary protected, whereas Salzburg and since early 2016 also Lower Austria list the subsidiary protected as ineligible (Mindestsicherungsgesetz, 2010; NOE Mindestsicherungsgesetz Änderung 1, 2016)[5]. Thus, if a single subsidiary protected wants to live outside a refugee camp, and does not have a job yet, she will receive €215 per month for subsistence and €150 for rental costs in Lower Austria and Salzburg. In Burgenland and Styria the respective levels are €200 for subsistence and €120 for rental costs. If she moved to any other state, she could

[3]This support system (both the housing and the monetary and/or in kind assistance) is referred to as "Grundversorgung" (i.e. basic subsistence support) in German (Grundversorgungsvereinbarung - Art. 15a B-VG, 2004; Aigner, 2019).

[4]Couples receive 75% of the baseline per person, and for the first three children, parents receive 18% of the baseline and 15% for any further children. The value is adjusted for inflation every year.

[5]See grundversorgunginfo.net for an overview of the benefits available to the subsidiary protected.

claim minimum income support and her benefit income would more than double.

Following the increase in refugee arrivals in 2015 some political parties expressed the concern that the level of minimum income support was too high and would thus prevent refugees from taking up work and attract more asylum seekers.[6] As a consequence, some federal state governments wanted to cut welfare assistance for refugees and in 2016, a former Austrian-wide agreement on the baseline level of minimum income support was not extended. In 2016 and 2017, three states introduced reforms of the needs-based minimum income support, but in 2018 these were revoked for violating the Geneva convention. The reforms resulted in significant cuts to the welfare assistance available to refugees (see Table A5 in the appendix for details).

- In Lower Austria in April 2016 access to minimum income support for the subsidiary protected was revoked, so that they could only receive basic subsistence support henceforth.
- In Upper Austria in July 2016 minimum income support was cut for the subsidiary protected and those asylees, who arrived to Austria after November 15th 2015. For a single household, the new level was €522.
- In Lower Austria in January 2017 minimum income support was reduced to €572.50 for a single household, if the recipient had spent less than 5 of the last 6 years in Austria. The provision was meant to affect asylees primarily. For large households, a cap of €1500 on the total received was introduced.
- In Burgenland in April 2017 minimum income support was reduced to €585 for a single household, who had spent less than five out of the last six years in Austria, and a cap of €1500 for the total received by a household was introduced.

# 3 Theory, Identification and Estimation

We use the variation in benefits to different groups described in the previous section to identify the impact of welfare benefits on immigrants' location choices. For this we refer to a standard random utility model. In this the utility ($U_{pkt}$) of an individual belonging to group $p \in \{a, s\}$ (with $a$ for asylees or $s$ subsidiary protected) of residing in location $k \in \{j, j^*, v\}$ at time $t$ depends on a random utility component as well as welfare benefits and amenities. Mirroring the institutional situation in Austria, benefits may vary across groups in some (treated) states (denoted by $j^*$) but not in others (denoted by $j$). In states that differentiate between asylees and subsidiary protected benefits are $\overline{w}_{aj^*}$ for asylees and $\underline{w}_{sj^*}$ for subsidiary protected, with $\overline{w}_{aj^*} > \underline{w}_{sj^*}$. In states that do not differentiate between these groups the benefits are $\overline{w}_{jp}$ for both groups.

[6] E.g. the successful election campaign of the Austrian conservative People's Party in 2017 used "Stop immigration into the welfare system" as a campaign slogan.

Amenities, by contrast, are composed of two components: a state-time-specific amenity ($a_{kt}$) that captures any effects relating to the attractiveness of a region, (e.g. a favorable labor market, local support structures for refugees) and a group-specific amenity ($g_{pt}$), which captures any effects that are specific to a refugee's protection status. This latter amenity arises from e.g. the attractiveness of the refugee camps and may vary across protection status because entitlements to residence in refugee camps differ for asylees and subsidiary protected. It also varies over time because the attractiveness of camps is most likely affected by how crowded the camps are. It is, however, lost if the refugee moves to another state (as upon migration refugees lose access to subsidized housing in refugee camps) and can thus be considered a component of migration costs.

As amply demonstrated in the migration literature (see Beine et al., 2016) in this setting, under appropriate assumptions on the distribution of the random utility component, the probability of a refugee leaving state $j$ to a reference state $v$ is equal, in expectation, to the share of refugees moving to this location ($m_{pkv,t}$) and is given by:

$$m_{pkv,t} = a_{vt} + \beta w_{vp} - (g_{pt} + a_{kt} + \beta w_{kp}) \tag{1}$$

Moving from $k \in \{j, j^*\}$ to $v$ implies losing the state-time specific amenities $a_{kt}$, and the group specific amenities ($g_{pt}$) and benefits $w_{pk}$ available to people with protection $p$ in location $k$ but results in a gain of the state time specific amenities ($a_{vt}$) and the benefit levels $w_{vp}$ in the receiving state.

### 3.1 Static variation and difference in difference estimation

To deal with the unobserved state- and group-specific amenities, two different identification strategies are employed. The first exploits static variation in welfare benefit levels across states and groups. It compares mobility rates to a reference state $v$ between subsidiary protected and asylees in states with and without welfare differentials between the two groups. In the reference state $v$ both groups receive regular welfare benefits. In states in which the subsidiary protected receive low welfare benefits the difference in migration rates between the two groups is given by:

$$\begin{aligned} m_{sj^*v,t} - m_{aj^*v,t} &= a_{vt} + \beta\overline{w}_{sv} - (g_{st} + a_{j^*t} + \beta\underline{w}_{sj^*}) - (a_{vt} + \beta\overline{w}_{av} - (g_{at} + a_{j^*t} + \beta\overline{w}_{aj^*})) \\ &= \beta\overline{w}_{aj^*} - \beta\underline{w}_{sj^*} + g_{at} - g_{st} \end{aligned} \tag{2}$$

In states where both groups receive the same benefit level this difference in the migration rates to a reference state $v$ is given by:

$$m_{sjv,t} - m_{ajv,t} = a_{vt} + \beta\overline{w}_{sv} - (g_{st} + a_{jt} + \beta\overline{w}_{sj}) - (a_{vt} + \beta\overline{w}_{av} - (g_{at} + a_{jt} + \beta\overline{w}_{aj})) = g_{at} - g_{st} \tag{3}$$

Taking the difference between equations (2) and (3) thus provides the effect of interest i.e.:

$$\Delta = (m_{sj^*v,t} - m_{aj^*v,t}) - (m_{sjv,t} - m_{ajv,t}) = \beta(\overline{w}_{aj^*} - \underline{w}_{sj^*}) \tag{4}$$

such that the effect of welfare benefits on immigration can be estimated in a standard difference-in-difference framework, by estimating the following linear probability model:

$$m_{jvp,t} = \beta Treated_{j^*,p=s} + \gamma_1 a_{jt} + \gamma_2 g_{pt} + x_i'\delta + \epsilon_{ijp,t} \tag{5}$$

In this specification $m_{jvp,t}$ is an indicator variable for individuals that migrated post-recognition as the dependent variable. $Treated_{j^*,p=s}$ is an indicator variable for the treated group (i.e the subsidiary protected $p = s$ in the treatment states $k = j^*$). $a_{jt}$ are state-time specific fixed effects for the state, a refugee was assigned to, i.e. the state pre-recognition. $g_{pt}$ are group-time specific fixed effects for the subsidiary protected. $x_i'$ are a set of individual level controls for gender, age, nationality and the duration of the asylum procedure.[7]

The central assumption for the estimated effect to be causal in this specification is that - just as in the common trend assumption in more conventional difference-in-difference applications - the difference in the behaviour of the subsidiary protected and asylees, captured by the term $g_{pt}$ in the regression, would have been equal across the states had it not been for the treatment. This assumption may pose a threat to identification if some states provide special support that affects asylees and the subsidiary protected differently. For instance, some states might provide generous housing support to asylees, who have to leave the camps, and this might reduce the mobility gap between asylees and subsidiary protected thereby making the mobility gap less comparable to other states. An advantage of this identification strategy is that it can be applied to several federal states and to a time span of five to six years and thus provides for a large number of observations of treated and untreated refugees.

### 3.2 Dynamic variation and difference-in-difference-in-difference estimation

In addition to the static variation in benefit levels, we also observe dynamic variation in benefit levels due to the welfare benefit reforms at the state level. We focus on the two reforms in Lower Austria and the reform in Burgenland, but exclude the reform in Upper Austria from our analysis, because it is different in structure as only a subgroup of asylees who arrived in Austria after November 15th, 2015, and the subsidiary protected are affected.[8] The reforms in Lower Austria and Burgenland provide a means

[7] Note that in this specification we do not include receiving region fixed effects. This is because, as shown below, the vast majority of mobility in Austria is from other provinces to Vienna, such that there is only one relevant receiving region.

[8] This adds another time dimension, i.e. time of arrival, complicating the analysis, and leaves us with a low number of observations in one relevant control group (i.e. asylees who arrived after November 15th, 2015, but were granted asylum in Upper Austria before the introduction of the reform).

to relax the assumption that $(g_{at} - g_{st})$ is constant across states, as the benefit reforms we analyze introduce variation over time for either asylees or the subsidiary protected within a federal state.

To illustrate this we introduce an additional time-invariant, state-group specific term for amenities in the state of origin $(g_{pk})$ in equation (1) and add a subscript $t$ to the welfare benefit variable, now $w_{ktp}$, such that this equation now is:

$$m_{pkvt} = a_{vt} + \beta w_{vtp} - (g_{pt} + a_{kt} + g_{pk} + \beta w_{ktp}) \tag{6}$$

and compare states $j^*$ which introduced a reform between $t'$ and $t^*$ that affected a particular group $p^*$, to other states $j$ without any changes between $t'$ and $t^*$. Inserting equation (6) into equations (2) and (3) and proceeding as above the difference-in-difference in migration rates in the post reform period $(t^*)$ is:

$$\Delta_{t^*} = (g_{pj^*} - g_{p^*j^*}) - (g_{pj} - g_{p^*j}) - \beta(\underline{w}_{j^*t^*p^*} - \overline{w}_{j^*t^*p}) \tag{7}$$

while in the pre-reform period $t'$, when both states did not discriminate between groups this difference-in-difference is:

$$\Delta_{t'} = (g_{pj^*} - g_{p^*j^*}) - (g_{pj} - g_{p^*j}). \tag{8}$$

Therefore, the causal effect of interest can be identified from taking the difference between equations (7) and (8) above and estimated from a standard difference-in-difference-in-difference estimation:

$$\begin{aligned} m_{ijp,t} = & Treated_{j^*t^*p^*} + \gamma_1 a_{jt} + \gamma_2 g_{pt} + \gamma_3 g_{jp} \\ & x_i'\delta + \epsilon_{ijpt} \end{aligned} \tag{9}$$

where all symbols have the same interpretation as above but $Treated_{j^*t^*p^*}$ indicates whether a person was affected by a welfare reform at the time of her first location choice and $g_{jp}$ is a set of group specific state fixed effects.

# 4 Data

The main data source used to estimate equations (5) and (9) is the Austrian Social Security Database (ASSD). This is a large scale administrative panel data set including all persons insured with the Austrian social security system for at least one day since the 1970's (see Zweimüller et al., 2009) and is a standard data set in Austrian labor market

research (e.g. Nekoei and Weber, 2017; Mahringer and Zulehner, 2015). It contains a daily calendar of the social security status of an individual, as well as information on a person's age, gender and nationality and on the province of residence[9]. This data can be used to identify asylum seekers because asylum seekers receive health insurance which (as of 2010) is coded under a special code (O4) in the ASSD within days after applying for asylum.[10]

This data is merged with data from the Austrian Public Employment Service (PES). This contains information on the outcome of a refugees' asylum procedure, in particular, the date of recognition of an asylum claim[11], and whether a person received the full protection status "asylum" or the complementary status "subsidiary protection". In contrast to ASSD data, however, PES data only contains information on those refugees, who have been registered with the public employment service as job seekers at least once after receiving their protection status. Doing so is a prerequisite for being able to claim minimum income support for working-age, healthy adults without care obligations.

The main data set used in this paper thus covers all active aged (15 to 64 year old) asylum seekers that registered asylum claims with the Austrian social security system after 2010, received an official asylum status in the period 2012 to 2017 and were registered with the Austrian public employment service at least once. It contains observations on 32,433 refugees and their location choices in the months after receiving protection as well as on their age, gender and nationality (see Table 1 for summary statistics). The largest group are refugees from Syria, who make up 47% of the sample. Other important countries of origin are Afghanistan with 28%, Iraq with 8%, Somalia with 5% and Iran with 5%. 77% are male and 23% female, and 45% are 25 or younger. 68% arrived in 2014 and 2015, whereas more than 60% were granted asylum in 2016 and 2017.

Thus while demographic characteristics of the asylum seekers in our data are largely comparable to the aggregate level relative to official asylum statistics (see Appendix A.1) these data contain only a third of all asylum seekers, who received an asylum title in the same time period according to official asylum statistics. This substantial discrepancy is on the one hand due to our sample restrictions as we focus only on active aged persons who applied for asylum after 2009. In comparison the asylum statistics include everyone regardless of age, entry cohort, and also include persons arriving under family reunification schemes that we cannot identify in the ASSD[12]. On the other hand the discrepancy is due to our baseline sample being restricted to refugees that were registered with the PES at least once and for whom consistent information on their location pre-

[9]We have access to two different variables on location for refugees in Austria, both stemming from the ASSD. The first refers to the place of residence. The second refers to the place of insurance. We use only observations with consistent information in both definitions.

[10]Additional information on data construction and sampling is provided in the annex of the paper.

[11]For 2474 people, the date of recognition of their asylum claims had to be imputed based on their social security spell structure. A detailed explanation is provided in the Data Appendix. Additional estimates not reported here show that results are qualitatively robust to the exclusion of the imputed data.

[12]Refugees arriving via family reunification usually do not receive basic subsistence support and are thus not registered as being health insured as asylum seekers.

| Sample Characteristics | | | |
|---|---|---|---|
| | Total | % Women | % Men |
| N | 32,433 | 23.58 | 76.42 |
| Nationality | | | |
| Syrians | 15,322 | 23.44 | 76.56 |
| Afghans | 9,108 | 19.49 | 80.51 |
| Iraqis | 2,440 | 22.91 | 77.09 |
| Iranians | 1,743 | 29.37 | 70.63 |
| Somalis | 1,794 | 25.81 | 74.19 |
| Others | 2,026 | 36.92 | 63.08 |
| Age | | | |
| 15-17 | 3,703 | 19.31 | 80.69 |
| 18-25 | 10,953 | 17.57 | 82.43 |
| 26-40 | 13,143 | 26.04 | 73.96 |
| 41-64 | 4,634 | 34.25 | 65.75 |
| Year | | | |
| 2012 | 1,233 | 26.52 | 73.48 |
| 2013 | 1,590 | 25.41 | 74.59 |
| 2014 | 3,432 | 17.02 | 82.98 |
| 2015 | 6,223 | 16.68 | 83.32 |
| 2016 | 11,393 | 24.25 | 75.75 |
| 2017 | 8,562 | 29.57 | 70.43 |
| Dur.Asylum Proc. | | | |
| Mean in months | 15.56 | 13.91 | 16.07 |

Source: ASSD, Austrian Public Employment Service

Table 1: Data descriptives

and post-recognition is available (see data appendix for a detailed description).

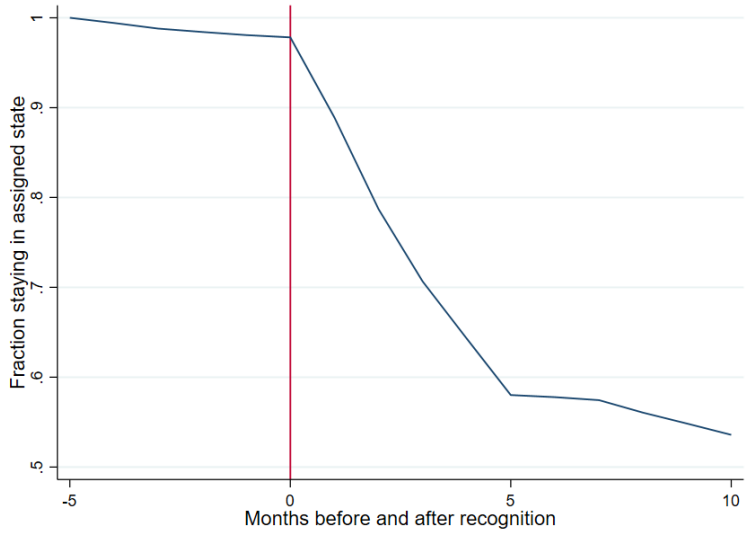
Mobility is measured by comparing a person's address five months post-recognition to that just prior to the recognition of the asylum status. Figure 1 shows the share of refugees who remain in the assigned state post recognition and illustrates the importance of the four months transition period at the end of which asylees lose access to basic subsistence support. In particular due to the institutional regulations governing asylum seekers in Austria, few people move across state borders prior to the recognition of their status (i.e the time period marked by negative numbers on the horizontal axes of Figure 1) but in the 4 months post-recognition, the fraction of refugees remaining in their original state drops substantially. Once the transition period is over, mobility rates become more stable again. Among the 26,954 refugees assigned to federal states outside Vienna in Austria, five months post-recognition 11,803 or 44% had moved to another state. Of these the vast majority (10,406 or 88.2% of all movers in the sample) had moved to Vienna.

There are also stark regional differences in the fraction of refugees remaining in their assigned state (see Table A6)[13]. This ranges from out-mobility rates of more than 70% for both subsidiary protected and asylees in Burgenland, to mobility rates of less than 15% for both groups in Vorarlberg. In particular Tyrol and Vorarlberg stand out for their low rates of out-mobility. This can be explained by a more generous housing support for both asylees and subsidiary protected in these states.

Among the destination states Vienna receives the vast majority of asylum seekers post-recognition from all federal states, with only a very small share of the refugees emigrating from Vienna. Consequently, the migration of asylees and subsidiary protected immediately after the recognition of their asylum status in Austria is mainly one from all Austrian federal states to Vienna. To account for this, in the subsequent analysis two dependent variables are constructed, one being $MoveVienna_{ijp,t}$ and the other being $MoveAll_{ijp,t}$. $MoveVienna_{ijp,t}$ is a dummy which is one if a person has moved to Vienna and is zero otherwise (and all persons who move to other states are excluded). $MoveAll_{ijp,t}$, also a dummy, is one if the person moved and zero if the person remained in her assigned state.

Our static variation identification strategy is based on comparing the mobility rates of subsidiary protected and asylees in non-metropolitan federal states, that were not affected by the welfare benefit reforms. Table 2 shows both the fraction of subsidiary protected and asylees leaving their respective assigned states. As can be seen from this table, asylees are more mobile than subsidiary protected in states where welfare levels are the same for both groups (Carinithia, Tyrol and Vorarlberg), but quite similar in states where welfare benefit levels differ (Styria, Salzburg, Burgenland). This suggests that the continued access of subsidiary protected to state provided housing after recogni-

[13]Given that refugees with asylum or subsidiary protection do not enjoy freedom of movement for workers within the EU, transnational moves are exceedingly rare, and in consequence the vast majority of refugees who leave their assigned federal state simply relocate within Austria.



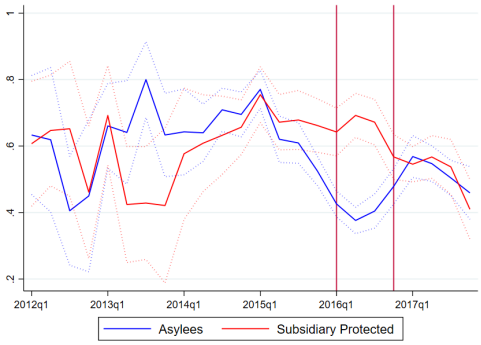

Note: Y-axis measures the stock of refugees in a state as a percentage of the stock 5 months before recognition, vertical line designates time of recognition.

Figure 1: Survival rate of refugees in the assigned state after receiving asylum.

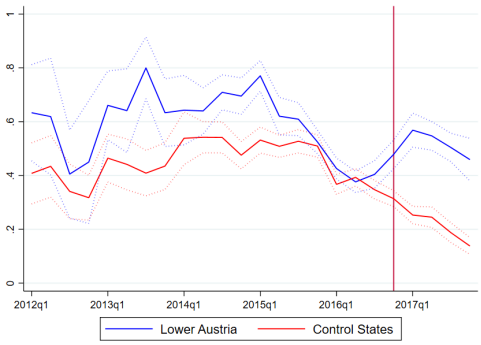
tion[14] reduces their mobility rates relative to asylees, but that lower welfare benefits for subsidiary protected in states that differentiate welfare benefits work to increase their mobility.

Our dynamic variation identification strategy gauges the influence of welfare benefit reforms on mobility rates in Lower Austria and Burgenland. The top panel of Figure 2 displays the development of the mobility rate of asylees and subsidiary protected in Lower Austria. In the pre-reform period from 2012-2015 mobility rates of subsidiary protected were roughly as high as those of asylees (at 63% respectively 64%) in Lower Austria but after the first reform in April 2016, which terminated the access of the subsidiary protected to minimum income support, mobility of asylees decreased markedly (to 41% from April to December 2016) but remained high for the subsidiary protected. By contrast in 2017, after the benefits of asylees were cut their mobility rates increased notably, whereas mobility of the subsidiary protected decreased. Eventually both mobility rates evened out at a somewhat lower level (of 53%). The middle panel of Figure 2 compares the development of mobility rates among asylees in Lower Austria to asylees in the control states. In the quarters preceding the reform, mobility was declining everywhere, but at the time of the reform mobility of asylees in Lower Austria increased by approximately 17 percentage points (from 40% in the third quarter of 2016 to 57% in

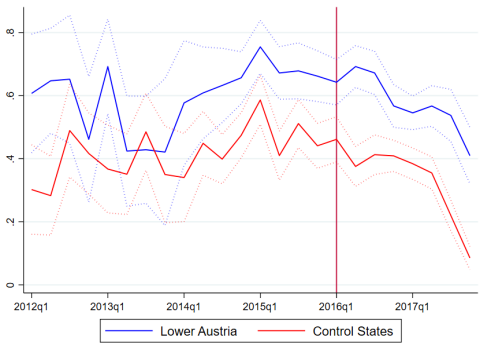
[14]As described in section 2 asylees have to exit basic subsistence support (and thus the refugee camps) at latest four months post-recognition. In contrast, the subsidiary protected do not lose access to basic subsistence support post-recognition.




(a) Asylees and subsidiary protected leaving Lower Austria




(b) Asylees leaving Lower Austria vs. control states




(c) Subsidiary protected leaving Lower Austria vs. control states

Note: The Figure shows the fraction leaving the assigned state in the 4 months post-recognition plotted at the quarter a person receives protection. Horizontal lines mark the quarter before the welfare reforms went into effect. The first reform in April 2016 affected subsidiary protected in Lower Austria, the second reform in January 2017 affected asylees in Lower Austria.

Figure 2: Post-recognition mobility rates

| Post-Recognition Mobility Rate | | |
|---|---|---|
| | Treated Group | Control Group |
| Treatment States | | |
| Styria | 52.0% | 52.3% |
| Salzburg | 45.8% | 34.3% |
| Burgenland | 78.7% | 77.0% |
| Control States | | |
| Carinthia | 46.7% | 60.5% |
| Tyrol | 9.1% | 16.7% |
| Vorarlberg | 8.0% | 12.8% |

Note: Average post-recognition out-mobility rates of the treated group, subsidiary protected and the control group, asylees. Averages are for 2012-2017, for Burgenland from 2012-2016. Data: ASSD, Austrian Public Employment Service.

Table 2: Group-specific Post-Recognition Mobility Rates in Treatment and Control States


(a) Asylees and Subsidiary protected leaving Burgenland

(b) Asylees in Burgenland vs. Control states

Note: The fraction leaving the assigned state in the 4 months post-recognition plotted at the quarter a person receives protection. The horizontal line marks the quarter before the welfare reform in Burgenland went into effect.

Figure 3: Post-recognition mobility rates

the first quarter of 2017), while mobility in the control states continued to decrease. In the bottom panel of Figure 2 post-recognition mobility rates of the subsidiary protected in Lower Austria vs. control states are shown. After the first reform there was a slight increase in the mobility of the subsidiary protected from Lower Austria, but a decrease in the control states and the gap seems to widen again at the end of 2017. Descriptive evidence on the two reforms in Lower Austria is thus largely consistent with the welfare magnet hypothesis, although this is more strongly so for the second than the first reform.

Mobility patterns in Burgenland, by contrast, are more difficult to reconcile with this hypothesis (see Figure 3). Prior to the reform, asylees in Burgenland displayed an exceptionally high post-recognition mobility rate of over 75%, but after welfare levels for asylees in Burgenland were cut, mobility declined to roughly 40%. Mobility of the subsidiary protected in Burgenland, who were not affected by the reform, only declined by 10 percentage points (from 78% to 68%). Similarly in the control states mobility declined smoothly from its peak in 2015 to the end of 2017, whereas in Burgenland there was a steep drop in the two quarters following the introduction of the reform. One possible reason for the trends in Burgenland may be related to the availability of housing for refugees. Due to overcapacity in refugee camps housing units in small privately run facilities previously used for asylum seekers might have been offered for rent to asylees, constituting a shift in the availability of housing for refugees in Burgenland at the time of the reform. In addition, this housing option only constitutes a change for asylees and not for the subsidiary protected, thus potentially threatening our identification assumptions.[15]

# 5 Estimation Results

## 5.1 Static Variation - Difference in Difference Estimation

Table 3 presents the results from estimating equation (5) using a linear probability model in which standard errors are clustered at the municipal level, to account for potential error correlation at the local level (Cameron and Miller, 2015; Bertrand et al., 2004). We run a cross-section analysis of refugees' location choices, wherein each person enters the regression equation only once, and control for the time a person received protection via quarter fixed effects that are interacted with the state and group-fixed effects.

[15] In 2015 and 2016, capacity of the refugee accommodation system in Austria was in need of expansion, and in Burgenland, this expansion was achieved by private homeowners offering housing, which was paid for by the state, to refugees. (See for instance: https://www.burgenland.at/wohnraumspende/.) This led to the creation of a large number of small housing units which were operating as small refugee camps. However, the number of refugees requiring housing decreased in 2017, due to fewer new arrivals and the ramped up processing of asylum claims, and many of these small camps were no longer needed. According to anecdotal evidence, some landlords of these accommodations decided to re-purpose the housing units and rent them to the asylees directly. This was an interesting offer for asylees in need of cheap housing. However, it did not affect the subsidiary protected, because for a landlord it is more profitable and secure to keep renting the housing unit to the federal government (and continue housing the subsidiary protected) instead of establishing a contract with the subsidiary protected directly.

The main specification reported in the top panel of this table uses $MoveVienna_{ijp,t}$ as dependent variable. The results in the first column are calculated based on observations from 2012 to 2016 and the full set of treatment states (Styria, Salzburg and Burgenland) and control states (Carinthia, Tyrol and Vorarlberg). The second column extends the estimation period to the years 2012-2017 but excludes Burgenland to avoid bias resulting from the reform in this state in 2017. The last two columns present estimates using only Carinthia as a control group but omit Tyrol and Vorarlberg because, due to their good housing support for asylees and subsidiary protected, they might be less comparable to the treatment states. The lower part of the top panel of Table 3 shows results for the same regressions, but now, instead of using one treatment dummy for all the treated to capture the average treatment effect on the treated (ATET), three separate treatment dummies are used for the treated in the three treated states (ATET Styria, ATET Salzburg and ATET Burgenland). The bottom panel repeats all these estimations but uses $MoveAll_{ijp,t}$ as the dependent variable, to account for the possibility that refugees may also move to other states in response to differences in welfare benefit effects.

As can be seen from this table, while effects vary slightly across specifications, the results suggest that the lower welfare benefit levels for subsidiary protected in the treated states have increased the mobility rates of the subsidiary protected by approximately 11 percentage points to a level of roughly 60% from 2012 to 2016. This holds true both when considering only mobility to Vienna and overall mobility as well as when estimating the model for observations from 2012-2016 including Burgenland and when estimating the model for observations from 2012-2017 excluding Burgenland. These effects are also highly statistically significant throughout. Thus when estimating the model for observations from 2012-2016 including Burgenland, we find an effect of 10.8 pp., and when estimating the model for observations from 2012-2017 excluding Burgenland, the effect is 12.5 percentage points.

To compare these estimates to the wider literature, we calculate a lower bound of the corresponding elasticities of internal emigration by observing that a single subsidiary protected living on her own in a treated state only receives monetary transfers ranging from €320 to €365. According to our estimates, if the subsidiary protected received regular welfare benefits, their mobility would decrease by 18.3% while their benefit income would increase by up to 162%. This implies an income elasticity of emigration of -0.11. For those subsidiary protected that live in refugee camps, approximating the elasticity requires making assumptions on the value of the in-kind transfer they receive in form of free housing. Aigner (2019) finds that newly recognized refugees often pay up to €300 for a place in a shared flat on the free market. Taking this number as a measure of refugees' willingness to pay for housing and adding the €200 they receive for food and transport the elasticity of migration would be estimated at -0.27. This number is comparable to the estimates provided by Clark et al. (2007) in the international migration literature and well within the range of estimates found in this literature.[16]

[16]Estimates of the income at origin elasticity of migration, which focus on international migration and are often derived from trade-theory inspired dyadic gravity models, vary widely. Estimates range from

At the state level we find highly significant results for both Styria and Salzburg. The effect in Salzburg is slightly stronger, at approximately 17 percentage points, whereas the effects in Styria and Burgenland are estimated at 9 and 8 percentage points, respectively. A t-test for the effects of Styria and Salzburg shows that we can reject the null-hypothesis of equal effects at the 5% confidence level. The effect for Burgenland is only imprecisely estimated and we can neither reject that the effect is equal to zero, nor that the effect is equal to the effect found in Salzburg. Once again based on the same assumptions the implied income elasticities of migration in these estimates range between -0.3 and -0.6 for Salzburg and -0.1 and -0.3 for Styria and are thus within the realms of the estimates provided in the literature.

0 (Mayda, 2010) to -0.44 (Clark et al., 2007) to -3.1 (Bertoli and Fernández-Huertas Moraga, 2013)

| Dependent Variable: $MoveVienna_{ijp,t}$ | | | | |
|---|---|---|---|---|
| Control States | Carinthia, Tyrol, Vorarlberg | | Carinthia | |
| | 2012-2016 | 2012-2017 | 2012-2016 | 2012-2017 |
| ATET | 0.1078*** | 0.1248*** | 0.1536*** | 0.1651*** |
| | ( 0.0273) | ( 0.0238) | ( 0.0435) | ( 0.0364) |
| ATET Styria | 0.0936** | 0.0997*** | 0.1416** | 0.1414*** |
| | ( 0.0290) | ( 0.0234) | ( 0.0445) | ( 0.0361) |
| ATET Salzburg | 0.1660*** | 0.1797*** | 0.2146*** | 0.2188*** |
| | ( 0.0401) | ( 0.0280) | ( 0.0524) | ( 0.0395) |
| ATET Burgenland | 0.0807$^{+}$ | | 0.1174* | |
| | ( 0.0435) | | ( 0.0544) | |
| Nr. Clusters | 476 | 479 | 324 | 302 |
| N | 10,478 | 12,792 | 7,563 | 8,790 |
| Dependent Variable: $MoveAll_{ijp,t}$ | | | | |
| Control States | Carinthia, Tyrol, Vorarlberg | | Carinthia | |
| | 2012-2016 | 2012-2017 | 2012-2016 | 2012-2017 |
| ATET | 0.1141*** | 0.1328*** | 0.1539*** | 0.1700*** |
| | ( 0.0259) | ( 0.0246) | ( 0.0392) | ( 0.0350) |
| ATET Styria | 0.0962*** | 0.1015*** | 0.1402** | 0.1424*** |
| | ( 0.0270) | ( 0.0225) | ( 0.0399) | ( 0.0337) |
| ATET Salzburg | 0.1758*** | 0.1988*** | 0.2152*** | 0.2309*** |
| | ( 0.0390) | ( 0.0275) | ( 0.0486) | ( 0.0380) |
| ATET Burgenland | 0.0915* | | 0.1213* | |
| | ( 0.0408) | | ( 0.0492) | |
| Nr. Clusters | 483 | 483 | 328 | 305 |
| N | 11,167 | 13,590 | 8,120 | 9,428 |

Note: Each column in the upper and lower panel shows results from two regressions, one using a single Treatment dummy ATET, the other using a treatment dummy per treatment state (ATET Styria, ATET Salzburg, ATET Burgenland). Coefficients for control variables state-time fixed effects, group-time fixed effects, nationality, gender, agegroup and duration of asylum procedure are not reported. Data: ASSD, Austrian Public Employment Service. Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table 3: Model 1 - Regression Results

### 5.2 Dynamic Variation - Welfare Reforms

Results of linear probability model estimates of equation (9) with clustered standard errors for the time period 2012 to 2016 are presented in Table 4. As previously, each person enters the regression equation just once at the time she received protection. In this

table, the average treatment effect on the treated is estimated separately for each reform. Reform 1 refers to the first reform in Lower Austria (affecting subsidiary protected) while reforms 2 and 3 refer to the second reform in Lower Austria and the reform in Burgenland (both affecting asylees) respectively. Again we report results for both dependent variables ($MoveVienna_{ijp,t}$ and $MoveAll_{ijp,t}$) and also report specifications including all possible control states (i.e. Carinthia, Salzburg, Styria, Tyrol and Vorarlberg) in columns A and B and including only Carinthia, Salzburg and Styria as control states in columns B and D, so as to exclude potential biases to our estimates from the low mobility states of Tyrol and Vorarlberg.

We find clear evidence for the reforms in Lower Austria having a positive effect on mobility. Among the 599 subsidiary protected who received protection in Lower Austria in 2016 after their welfare benefits were cut, mobility is estimated to have increased by approximately 15 percentage points relative to the no-reform counterfactual, with point estimates ranging from 14.4 to 15.9 percentage points. A back of the envelope calculation shows that mobility increased by 23% due to the reform, while benefit income decreased by 56% for the subsidiary protected living on their own and by roughly 40% for subsidiary protected living in camps. This implies an income elasticity of internal emigration of -0.4 and -0.6 respectively. Thus while we estimate a sizeable percentage point effect, the implied income elasticity of migration that can be derived from this effect is once more in line with estimates in the previous literature.

The point estimates for the average treatment effect on the 1,115 treated asylees of the second reform in Lower Austria are higher and range between 24.8 and 27.3 percentage points (relative to a pre-reform baseline of 41%) depending on the specification used. This also implies a higher income elasticity of migration for asylees of around $-2$. This stronger effect suggests an asymmetric impact of welfare benefit reforms on asylees and subsidiary protected. This may be due to the requirement of Austrian law that asylees but not the subsidiary protected move out of refugee camps within 4 months after recognition of their status. Asylees thus face lower migration costs and accordingly, may be more susceptible to welfare benefit differentials in their location choices, than subsidiary protected.

By contrast, in Burgenland, where, however, the changes in access to housing for refugees mentioned above question the causal interpretation of our results, we find the effect of the welfare benefits reform on mobility to be negative and thus in stark contradiction to the welfare magnet hypothesis. Point estimates for the average treatment effect that are, however, based on a rather low number of observations (118) on treated persons in Burgenland range from -23.0 to -29.0 percentage points.

| | Dependent Variable | | | |
|---|---|---|---|---|
| | $MoveVienna_{ijp,t}$ | | $MoveAll_{ijp,t}$ | |
| Control States | All | Select | All | Select |
| | A | B | C | D |
| Reform 1 | 0.1585*** | 0.1537** | 0.1457** | 0.1435** |
| | ( 0.0434) | ( 0.0486) | ( 0.0446) | ( 0.0477) |
| Nr. Clusters | 719 | 567 | 728 | 326 |
| N | 15,133 | 12,218 | 15,963 | 12,916 |
| Reform 2 | 0.2726*** | 0.2514*** | 0.2480*** | 0.2582*** |
| | ( 0.0504) | ( 0.0535) | ( 0.0488) | ( 0.0532) |
| Nr. Clusters | 677 | 600 | 776 | 607 |
| N | 9,433 | 8,202 | 10,915 | 8,665 |
| Reform 3 | −0.2901*** | −0.2772*** | −0.2434** | −0.2296** |
| | ( 0.0772) | ( 0.0770) | ( 0.0735) | ( 0.0735) |
| Nr. Clusters | 555 | 378 | 561 | 383 |
| N | 14,052 | 10,050 | 14,947 | 10,785 |

Note: Reform 1 refers to the welfare cut for subsidiary protected in Lower Austria in April 2016, Reform 2 indicates the welfare cut for asylees in Lower Austria in January 2017 and Reform 3 marks the welfare cut for Asylees in Burgenland in April 2017. Coefficients for control variables state-time fixed effects, group-time fixed effects, state-group fixed effects, nationality, gender, agegroup and duration of the asylum procedure are not reported. Data: ASSD, Austrian Public Employment Service.
Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table 4: Average treatment effect on treated of the welfare benefit reforms.

### 5.3 Robustness Checks

In order to assess the reliability of our results we implemented further specifications addressing various issues.

The static variation identification strategy focuses on subsidiary protected as the treated group exclusively. Given that the subsidiary protected do not lose legally guaranteed access to basic subsistence support four months post-recognition, it is conceivable that at least some subsidiary protected will delay their location choice and wait in the camps until a suitable accommodation is available. We thus constructed two alternative dependent variables $MVie12_{ijp,t}$ and $MAll12_{ijkp,t}$ for having moved to Vienna or out of the assigned state measured 12 months post-recognition, respectively. Medium term location choices of refugees, who received protection in Austria from 2012 to 2016, can thus be analyzed. Table A7 in the appendix shows the results of this analysis for the static identification strategy. The effects of the low welfare benefit level for the subsidiary protected in Burgenland, Salzburg and Styria are now more pronounced compared to

the specification focusing on short-term location choice. In particular, we can now discern a significant positive effect of 14 percentage points on the propensity of subsidiary protected to leave Burgenland for Vienna.

Regarding the dynamic identification strategy, in the baseline specification people who received protection in the months prior to the introduction of the reform are regarded as untreated. Thus, we make the assumption that a person's location choice is taken at the moment she receives protection such that we exclude anticipation effects. It is, however, conceivable that refugees' location choices were either affected by the anticipated reform or that they were taken only in the second or third month post-recognition, when the reform might already have been introduced. To deal with these issues, we run an alternative specification excluding people who received protection four months prior to the introduction of the reform. The four month period was chosen because this is the longest possible time for which asylees may receive basic income support. Results are presented in the appendix in Table A8. The effect sizes for the reforms in Lower Austria increase by approximately one standard deviation, while they remain unchanged for Burgenland (see Tables A8 in the appendix). These sensitivity checks thus suggest that the baseline specification results are on the conservative side.

The dynamic variation model also allows for the implementation of Placebo tests. Thereby we test whether there are any significant effects of reform dummies in states where no reform took place. If we found significant effects in the placebo treatments, this would indicate that there are important factors omitted and would call into question the validity of our results. We proceeded as follows: Taking the main specification of the model (i.e. $MoveVienna_{ijp,t}$ as dependent variable and all possible control states included), for each reform we exclude the treated state and create new interaction terms $PlaceboTreated_{jt^*p^*}$, an interaction of the dummies for treatment time $t^*$, the treated group $g_{p^*}$ and one of the control states $a_j$. In the model, we replace the variable $Treated_{j^*t^*p^*}$[17] with $PlaceboTreated_{jt^*p^*}$. For each reform, we run as many placebo tests as there are control states, thus checking whether we find any effects that ought not be there. Findings for this exercise are presented in Table A9 in the Appendix. Overall, the Placebo tests yield predominantly insignificant coefficients on $PlaceboTreated_{jtp}$ and thus inspire confidence in our main results. For the reforms in Lower Austria, all coefficients for the placebo treatments are insignificant. However, for the reform in Burgenland we find two significant coefficients for the placebo treatments in Tyrol and Vorarlberg. This thus once more suggests that results for the reforms in Burgenland should be interpreted with care due to the lower reliability of these estimates.

# 6 Conclusion

This paper studies the causal effect of welfare benefit levels on the location choice of immigrants. To this end it exploits the exogenous variation generated by a policy of initial

[17]The variable $Treated_{j^*t^*p^*}$ is the interaction of three dummies: a dummy for the state of the reform $a_{j^*}$, a dummy for the treated group $g_{p^*}$ and a dummy for treatment time $t^*$.

random dispersion of refugees across Austrian federal states, differences in welfare benefit levels for different refugee groups and three welfare benefit reforms in two Austrian federal states. Specifically the paper analyzes the first autonomous location choice of refugees at the time when they are granted protection and receive access to the labor market. Due to the high welfare dependence among refugees post-recognition, sizeable differences in regional benefit levels and low migration costs, refugees post-recognition are expected to be especially susceptible to benefit changes.

We find evidence for sizeable but also heterogeneous effects of benefits on migrants' location choice. Using the differential welfare access of asylees and subsidiary protected in some Austrian federal states, the average effect of welfare differentials on mobility is estimated at approximately 11 percentage points thus incrementally increasing post-recognition mobility of the affected to roughly 60%. Based on the three welfare reforms analyzed we find even larger effects. The first reform affecting the subsidiary protected in Lower Austria is estimated to have increased mobility rates by approximately 16 percentage points to a level of 63%. The second reform in Lower Austria, affecting refugees with asylum, is estimated to have increased mobility by approximately 27 percentage points to a level of 50%. The only outlier to this is the reform in Burgenland where mobility of refugees decreased by more than 37 percentage points to 40% after welfare levels for refugees were cut.

The heterogeneity of the effects found also suggests a potential asymmetric impact of welfare reforms on asylees and subsidiary protected. This may be due to the requirement of Austrian law that asylees but not the subsidiary protected have to move out of refugee camps within 4 months after recognition of their status. It, however, also highlights the potential importance of further intervening factors shaping the effect of welfare benefits on refugees' location choices. These could for instance be the activities of local support institutions or the stringency with which policy changes are implemented. Exploring these intervening factors may be an important topic for future research.

Our work might also add an interesting aspect to the wider literature on migration and incentives. In contrast to a number of previous contributions that suggest that migration does not react strongly to economic returns (Bryan et al., 2014; Banerjee and Duflo, 2019) our findings do suggest a significant reaction. This may be due to our focus on a group that is particularly likely to be mobile due to institutional constraints. Also, unlike economic migrants who might or might not find a job in their destination location, our studied group do not face uncertainty regarding the returns on migration in the short term. Analyzing this contrast further might be another interesting avenue for future research.

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# A Appendix

## A.1 Data

In order to establish the data used in this paper, we combine several data sets. In this section, we explain the construction of this data and compare our data to Austrian asylum statistics assembled by the Ministry of the Interior (BMI, 2019).

Our main data source is the Austrian Social Security Database (ASSD). This records all people with health insurance in Austria. Asylum seekers are identified upon entry because they receive health insurance as an asylum seeker which is coded as the status O4 in the data. According to this data 215,781 asylum seekers entered Austria and initiated insurance spells in basic subsistence support from 2010 to 2018. This raw data matches the official asylum statistics on asylum claims lodged in Austria rather well, with the remaining differences being due to some refugees not being in need of subsistence support.

| | Arrivals ASSD | Asylum Claims | ASSD-Data, protection likely | Asylum Claims granted |
|---|---|---|---|---|
| 2010 | 7,222 | 11,012 | 421 | 4,726 |
| 2011 | 10,283 | 14,416 | 1,535 | 5,595 |
| 2012 | 13,237 | 17,413 | 2,542 | 5,730 |
| 2013 | 13,164 | 17,503 | 3,028 | 5,952 |
| 2014 | 23,584 | 28,064 | 6,248 | 11,535 |
| 2015 | 80,433 | 88,340 | 11,999 | 19,003 |
| 2016 | 39,005 | 42,285 | 23,038 | 27,552 |
| 2017 | 19,843 | 24,735 | 23,344 | 30,428 |
| 2018 | 9,010 | 13,746 | 15,954 | 20,809 |
| Total | 215,781 | 257,514 | 88,109 | 131,330 |

Table A1: ASSD-data vs asylum statistics

This data is merged with data from the Austrian labor market service (AMS). This contains information on the protection status of recognized refugees (which may be subsidiary protected or asylees) and the date at which this protection was granted, for all persons who received a positive protection status and registered with the AMS as job seekers at least once during their career in Austria.

Since we are interested only in asylum seekers who were granted protection, we exclude persons who either were not granted protection or still have ongoing asylum procedures.[18] In this step 119,792 persons with ongoing or negative asylum procedures are dropped from the data.

In addition, we clean the data by dropping asylum seekers with unconventional asylum procedures and/or cases where the two data sets provide contradictory information. This includes the omission of:

[18]These are persons who have no status in the AMS data and also did not have a spell other than O4 in the period 2010 to 2018.

- 4,135 people who had other insurance spells in Austria before entering basic subsistence support, indicating previous stays in Austria, or overstaying visas.
- 1,759 people who received asylum before entering basic subsistence support and were probably miscoded in one of the data sets.
- 1,614 people who received asylum immediately after arriving in Austria, so that there is no asylum procedure to speak of and no exogeneous distribution to the states.
- 373 people who died while waiting for the end of their asylum procedure.
- 5 people with missing observations on gender.

The results of these data cleansing processes can be compared to the number of positive asylum decisions reported in the asylum statistics of the BMI, see Table A1. Relative to official data we have substantially fewer observations. In the early years of our observation period much of this discrepancy can be explained by our exclusion of refugees who arrived in Austria before 2010. Another factor driving this discrepancy are family members of refugees who arrive in Austria via family reunification. If a person is granted asylum, his or her partner and minor children can apply for a family visa and travel to Austria. Once arrived, the family members have to apply for asylum which they are guaranteed to receive. While they are counted as asylum seekers who were granted asylum in the official asylum statistics, most of them will not show up in the ASSD data under an O4 spell, as they usually join their family member upon arrival and are not admitted into a refugee camp. Finally, also children born to asylees or the subsidiary protected receive a refugee protection status and are counted in the asylum statistics, but they are not included in our data because they never have an O4 spell.

For our analysis we focus only on asylum seekers who received protection in the years 2012 to 2017. This leaves us with 70,199 persons. Of these 54,677 are of active age (15 to 64 years old) among whom 41,972 have been registered with the public employment service at least once, so that we can observe the status they received in the asylum procedure.

Of the remaining 12,705 refugees of active age 5,479 did not register as job seekers because they started to work immediately after the end of their health insurance as an asylum seeker (O4) spell and never registered with the Austrian PES. A significant share of them might also be working asylum seekers who are ineligible for welfare benefits and thus not relevant for our analysis, (e.g. self-employed Indian and Pakistani nationals). The rest did not register for other reasons (e.g because they had care obligations or were otherwise inactive in the labor market). Some might also have received humanitarian protection, a protection status that enables them to remain and work in Austria, but excludes them from any type of welfare benefits.

Finally, we establish a person's location based on two variables i.e. the postal codes of residence and the state of a person's insurance provider contained in the ASSD. In our baseline results we include only those for whom information on the place of residence and the state of insurance coincide prior to the person receiving protection. While a person receives basic subsistence support, the state of her insurance provider is a good proxy for the state of residence and it is updated more often than the residence data. However, after people exit basic subsistence support, the location data based on a person's insurance provider becomes unreliable as the state of a person's employer may differ from his or her state of residence due to commuting and in addition, overlapping spells might provide contradictory information. Thus, we determine a person's federal state post-recognition by only using the postal code data from the ASSD. Omitting cases with missing or inconsistent pre- an post-recognition place of residence information leaves

| | Data used | | | |
|---|---|---|---|---|
| | Main Sample | | Alternative Sample | |
| | N | % | N | % |
| Burgenland | 1,357 | 4.18 | 1,511 | 3.91 |
| Carinthia | 2,305 | 7.11 | 2,569 | 6.65 |
| Lower Austria | 7,790 | 24.02 | 9,857 | 25.52 |
| Upper Austria | 4,217 | 13.00 | 4,799 | 12.43 |
| Styria | 2,609 | 8.04 | 3,024 | 7.83 |
| Salzburg | 4,514 | 13.92 | 4,975 | 12.88 |
| Tyrol | 2,529 | 7.80 | 2,717 | 7.04 |
| Vorarlberg | 1,633 | 5.03 | 1,775 | 4.60 |
| Vienna | 5,479 | 16.89 | 7,394 | 19.15 |
| Total | 32,433 | 100% | 38,621 | 100% |

Table A2: Main sample vs. alternative sample.

us with 32,433 observations in our baseline specification.[19] As a robustness check we, however, assemble an alternative sample that makes more generous use of the data so as to include 38,621 observations. For this, we determine a person's state pre-recognition based on the residence information from the ASSD and for those, for whom this information is missing, we supplement it based on the state of the insurance provider.[20]

In the following, we report the main results from the paper recalculated based on the alternative sample. Clustering at the municipal level is now impossible, as we cannot determine a person's municipality if only the state of the insurance provider is known. The results in Table A3 and A4 are quantitatively similar to our main results. Without the clustering and with more observations, standard errors are smaller.

[19]Postal code data for the place of residence pre-recognition is available for 34,508 people. For 2,075 people, the state of the insurance provider during basic subsistence support does not coincide with the state of residence according to the ASSD. We drop these observations.

[20]The 2,075 people excluded from the main sample for inconsistencies are included now, and their state pre-recognition is determined based on the residence data.

| Dependent Variable: $MoveAll_{ijkp,t}$ | | | | |
|---|---|---|---|---|
| Control States | Carinthia, Tyrol, Vorarlberg | | Carinthia | |
| | 2012-2016 | 2012-2017 | 2012-2016 | 2012-2017 |
| ATET | 0.1176*** | 0.1347*** | 0.1488** | 0.1631*** |
| | ( 0.0183) | ( 0.0161) | ( 0.0274) | ( 0.0241) |
| N | 12,432 | 15,060 | 9,149 | 10,568 |
| ATET Styria | 0.1184*** | 0.1110*** | 0.1601*** | 0.1413*** |
| | ( 0.0215) | ( 0.0181) | ( 0.0289) | ( 0.0251) |
| ATET Salzburg | 0.1635*** | 0.1858*** | 0.1980*** | 0.2043*** |
| | ( 0.0299) | ( 0.0235) | ( 0.0357) | ( 0.0295) |
| ATET Burgenland | 0.1319** | | 0.1607** | |
| | ( 0.0289) | | ( 0.0347) | |
| N | 12,432 | 15,060 | 9,149 | 10,568 |
| Dependent Variable: $MoveVienna_{ijkp,t}$ | | | | |
| Control States | Carinthia, Tyrol, Vorarlberg | | Carinthia | |
| | 2012-2016 | 2012-2017 | 2012-2016 | 2012-2017 |
| ATET | 0.1084*** | 0.1244*** | 0.1468*** | 0.1599*** |
| | ( 0.0185) | ( 0.0161) | ( 0.0281) | ( 0.0246) |
| N | 11,615 | 14,119 | 8,489 | 9,816 |
| ATET Styria | 0.1134** | 0.1072*** | 0.1600** | 0.1424** |
| | ( 0.0218) | ( 0.0182) | ( 0.0297) | ( 0.0256) |
| ATET Salzburg | 0.1473*** | 0.1636*** | 0.1919** | 0.1935*** |
| | ( 0.0307) | ( 0.0239) | ( 0.0367) | ( 0.0301) |
| ATET Burgenland | 0.1175** | | 0.1527** | |
| | ( 0.0300) | | ( 0.0360) | |
| N | 11,615 | 14,119 | 8,489 | 9,816 |

Note: Each column in the upper and lower panel shows results from two regressions, one using a single Treatment dummy ATET, the other using a treatment dummy per treatment state (ATET Styria, ATET Salzburg, ATET Burgenland). Coefficients for control variables state-time fixed effects, group-time fixed effects, nationality, gender, agegroup and duration of asylum procedure are not reported. Data: ASSD, Austrian Public Employment Service. Large sample, relaxed consistency requirement regarding location information.
Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table A3: Static Variation - Results based on largest possible sample

## A.2 Welfare Benefit Reforms in Austria and Refugee Mobility

| Dependent Variable | | | | |
|---|---|---|---|---|
| | $MoveVienna_{ijp,t}$ | | $MoveAll_{ijp,t}$ | |
| Control States | All | Select | All | Select |
| | A | B | C | D |
| Reform 1 | 0.1593*** | 0.1508*** | 0.1416*** | 0.1337*** |
| | ( 0.0344) | ( 0.0393) | ( 0.0336) | ( 0.0372) |
| N | 17,697 | 12,984 | 18,921 | 15,638 |
| Reform 2 | 0.2546*** | 0.2379*** | 0.2511*** | 0.2583*** |
| | ( 0.0407) | ( 0.0428) | ( 0.0374) | ( 0.0415) |
| N | 9,876 | 8,952 | 11,977 | 9,557 |
| Reform 3 | −0.2989*** | −0.2850*** | −0.2481*** | −0.2331*** |
| | ( 0.0672) | ( 0.0688) | ( 0.0647) | ( 0.0663) |
| N | 15,520 | 11,217 | 16,571 | 12,079 |

Note: Reform 1 refers to the welfare cut for subsidiary protected in Lower Austria in April 2016, Reform 2 indicates the welfare cut for asylees in Lower Austria in January 2017 and Reform 3 marks the welfare cut for Asylees in Burgenland in April 2017. Coefficients for control variables state-time fixed effects, group-time fixed effects, state-group fixed effects, nationality, gender, agegroup and duration of the asylum procedure are not reported. Data: ASSD, Austrian Public Employment Service. Large Sample, consistency requirement regarding location information relaxed.
Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table A4: Dynamic Variation - Results based on largest possible sample

| Reform | Description |
|---|---|
| Subsidiary Protected in Lower Austria, April 2016 | Their eligibility for minimum income support is revoked. A single adult who received €838 while on minimum income support, now only gets €365 if living on her own, or has the option to stay in a refugee camp |
| Upper Austria, July 2016 | A new minimum income standard is introduced for subsidiary protected and asylees, who have come to Austria after November 15th, 2015. On this date, a reform takes effect renaming the protection status "asylum" "temporary asylum". The new minimum income standard is €522. In November 2018, the reform is revoked by the European Court of Justice. |
| Asylees in Lower Austria, January 2017 | A new minimum income standard "integration" for people who have spent less than 5 out of the last 6 years in Austria is introduced. For a single adult the new minimum standard is €572.50. For families and people living in a shared flat an additional cap of €1500 is introduced for the total a household can claim irrespective of the number of people (NOE Mindestsicherungsgesetz Änderung 2, 2016). In March 2018, the reform is revoked by the Constitutional Court. |
| Asylees in Burgenland, April 2017 | A new minimum income standard "integration" for people who have spent less than 5 out of the last 6 years in Austria is introduced. For a single adult the new minimum standard is €585. For families and people living in a shared flat an additional cap of €1500 is introduced for the total a household can claim irrespective of the number of people living in the household (BU Mindestsicherungsgesetz Änderung, 2017). In March 2018, the reform is revoked by the Constitutional Court. |

Table A5: Welfare benefit reforms

| Assigned Fed. State | Remain | To Vienna | To Other States | Total |
|---|---|---|---|---|
| Burgenland | 366 | 894 | 97 | 1,357 |
| | 27.0% | 65.9% | 7.1% | |
| Carinthia | 1,006 | 1,136 | 163 | 2,305 |
| | 43.6% | 49.3% | 7.1% | |
| Lower Austria | 3,489 | 4,000 | 301 | 7,790 |
| | 44.8% | 51.3% | 3.9% | |
| Upper Austria | 2,896 | 1,120 | 201 | 4,217 |
| | 68.7% | 26.6% | 4.8% | |
| Salzburg | 1,639 | 764 | 206 | 2,609 |
| | 62.8% | 29.3% | 7.9% | |
| Styria | 2,157 | 2,088 | 269 | 4,514 |
| | 47.8% | 46.3% | 6.0% | |
| Tyrol | 2,148 | 259 | 122 | 2,529 |
| | 84.9% | 10.2% | 4.8% | |
| Vorarlberg | 1,450 | 145 | 38 | 1,633 |
| | 88.8% | 8.9% | 2.3% | |
| Vienna | 5,375 | - | 104 | 5,479 |
| | 98.1% | - | 1.9% | |

Source: ASSD, Austrian Public Employment Service

Table A6: Location Choice of Refugees Five Months Post-Recognition, 2012 - 2017

## A.3 Robustness

| Dependent Variable | $MoveAll_{ijkp,t}$ | | $MoveVienna_{ijp,t}$ | |
|---|---|---|---|---|
| Control States | C,T,V | C | C,T,V | C |
| ATET | 0.164*** | 0.201*** | 0.157*** | 0.202*** |
| | ( 0.026) | ( 0.040) | ( 0.027) | ( 0.044) |
| ATET Styria | 0.156*** | 0.197*** | 0.154*** | 0.200*** |
| | ( 0.028) | ( 0.041) | ( 0.029) | ( 0.045) |
| ATET Salzburg | 0.202*** | 0.241*** | 0.185*** | 0.235** |
| | ( 0.040) | ( 0.050) | ( 0.045) | ( 0.057) |
| ATET Burgenland | 0.143*** | 0.168*** | 0.134** | 0.167** |
| | ( 0.037) | ( 0.047) | ( 0.039) | ( 0.052) |
| N | 10,107 | 7,324 | 9,339 | 6,695 |
| Nr. Clusters | 474 | 322 | 465 | 315 |

Note: Each column in the upper and lower panel shows results from two regressions, one using a single Treatment dummy ATET, the other using a treatment dummy per treatment state (ATET Styria, ATET Salzburg, ATET Burgenland). Coefficients for control variables state-time fixed effects, group-time fixed effects, nationality, gender, agegroup and duration of asylum procedure are not reported. Data: ASSD, Austrian Public Employment Service. Dependent variable is whether a person has left the assigned state 12 months post-recognition.
Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table A7: Model 1 - Location choice 12 months post-recognition
Control States are either Carinthia, Tyrol and Vorarlberg: C/T/V or Carinthia only: C

| | Dependent Variable | | | |
|---|---|---|---|---|
| | $MoveVienna_{ijp,t}$ | | $MoveAll_{ijp,t}$ | |
| Control States | All | Select | All | Select |
| | A | B | C | D |
| Reform 1 | $0.1912^{***}$ | $0.1841^{***}$ | $0.1760^{***}$ | $0.1726^{***}$ |
| | ( 0.0442) | ( 0.0486) | ( 0.0452) | ( 0.0486) |
| Nr. Clusters | 689 | 541 | 699 | 320 |
| N | 13,082 | 10,537 | 13,804 | 11,144 |
| Reform 2 | $0.3588^{***}$ | $0.3392^{***}$ | $0.3444^{***}$ | $0.3461^{***}$ |
| | ( 0.0612) | ( 0.0654) | ( 0.0597) | ( 0.0669) |
| Nr. Clusters | 636 | 568 | 731 | 577 |
| N | 7,250 | 6,372 | 8,402 | 6,715 |
| Reform 3 | $-0.2757^{***}$ | $-0.2623^{**}$ | $-0.2268^{**}$ | $-0.2140^{**}$ |
| | ( 0.0783) | ( 0.0779) | ( 0.0745) | ( 0.0741) |
| Nr. Clusters | 536 | 367 | 542 | 371 |
| N | 12,527 | 9,055 | 13,325 | 9,710 |

Note: Reform 1 refers to the welfare cut for subsidiary protected in Lower Austria, Reform 2 indicates the welfare cut for asylees in Lower Austria and Reform 3 marks the welfare cut for Asylees in Burgenland. Coefficients for control variables are not reported. Observations on refugees, who received protection in the four months prior to the reforms are excluded. Data: ASSD, Austrian Public Employment Service. Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table A8: Diff-in-Diff-in-Diff Results, when observations on refugees in the four months prior to the introduction of the reforms are excluded.

| Dependent Variable: $MoveVienna_{ijp,t}$ | | | |
|---|---|---|---|
| Placebo Treatment | Reform 1<br>2012-2016 | Reform 2<br>2016-2017 | Reform 3<br>2012-2017 |
| Carinthia | −0.075 | 0.026 | 0.045 |
| | ( 0.055) | ( 0.059) | ( 0.071) |
| Salzburg | 0.087 | 0.024 | −0.071 |
| | ( 0.076) | ( 0.074) | ( 0.062) |
| Styria | 0.008 | −0.056 | −0.009 |
| | ( 0.062) | ( 0.062) | ( 0.047) |
| Tyrol | 0.056 | −0.031 | −0.074* |
| | ( 0.047) | ( 0.035) | ( 0.037) |
| Vorarlberg | −0.073 | 0.060 | 0.145* |
| | ( 0.056) | ( 0.049) | ( 0.059) |
| Nr. clusters | 418 | 412 | 479 |
| N | 9,530 | 6,124 | 12,792 |

Note: Placebo Tests. Each reported coefficient is the result of a separate regression, using $PlaceboTreated_{jp^*t^*}$ instead of $Treated_{j^*p^*t^*}$, thus testing whether the treated group in an untreated state significantly changed their behaviour during treatment time. We expect to see no significant results. Data: ASSD, Austrian Public Employment Service.
Clustered standard errors in parentheses: $^{+}$ $p < 0.1$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

Table A9: Placebo Tests
Each reported coefficient is the result of a separate regression, using $PlaceboTreated_{jpt}$ instead of $Treated_{jpt}$, thus testing whether the treated group in an untreated state significantly changed their behaviour during treatment time. As expected, results are predominantly insignificant.