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Daniel Auer, Michaela Slotwinski, Achim Ahrens, Dominik Hangartner, Selina Kurer, Stefanie Kurt, Alois Stutzer

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Social Assistance and Refugee Crime

Abstract

Despite intense policy debates, the relationship between social welfare and refugee crime remains understudied. Taking steps to address this gap, our study focuses on Switzerland, where mobility restrictions on exogenously assigned refugees coincide with cantons' autonomy in setting social assistance rates. Linking time-varying cantonal benefit rates between 2009 and 2016 to individual-level administrative data, we find that higher social assistance reduces criminal charges, especially for petty crimes and drug offenses. In light of limited (short-run) repercussions for refugees' labor market participation, our results suggest social assistance can be a cost-effective measure to improve refugee welfare and enhance public safety.

JEL-Codes: D020, H530, J180. K420.

Keywords: immigration, crime, welfare benefits, refugees, migration policy.

Daniel Auer
Collegio Carlo Alberto, Turin / Italy
daniel.auer@carloalberto.org

*Michaela Slotwinski**
University of Zurich / Switzerland
michaela.slotwinski@econ.uzh.ch

Achim Ahrens
ETH Zurich / Switzerland
achim.ahrens@gess.ethz.ch

Dominik Hangartner
ETH Zurich / Switzerland
dominik.hangartner@gess.ethz.ch

Selina Kurer
ETH Zurich / Switzerland
selina.kurer@gess.ethz.ch

Stefanie Kurt
HES-SO Valais/Wallis / Switzerland
stefanie.kurt@hevs.ch

Alois Stutzer
University of Basel / Switzerland
alois.stutzer@unibas.ch

*corresponding author

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1 Introduction

One of the most controversial debates in current migration policy revolves around the generosity of the welfare state towards recently arrived immigrants and refugees.[1] Arguing that generous social benefits reduce refugees' incentive to work and act as a pull factor for migration, many governments resort to restricting or reducing social benefits for refugees. According to a recent report by the European Council on Refugees and Exiles (2022), two-thirds of the 21 European countries surveyed do not grant refugees with temporary protection status full access to the welfare system. The controversial debate about refugees' entitlement to social benefits is also closely connected to the frequently voiced concern that refugees might exploit the welfare system and be more likely to commit crimes. However, while a reduction in social benefits might increase refugees' incentive to work, it does not necessarily lead to higher labor market participation, particularly when employment opportunities are scarce. In such a situation, social benefit cuts might instead increase refugees' propensity to engage in informal employment and illegal activities in order to secure a minimum income.

Our study contributes to this politically salient, albeit scientifically understudied topic by providing causal evidence on the link between welfare benefits and crime. We leverage subnational policy variation in Switzerland to examine how changes in the level of social assistance for refugees affect their likelihood of committing crimes. We collect original data on cantonal welfare benefits for the years 2009–2016 and link this information to high-resolution individual-level data on refugees, their employment trajectories, and their criminal charges. Several unique features of the institutional setting in Switzerland allow us to overcome common problems of inference and identify the causal effect of social assistance on criminal charges and the role of employment. First, the 26 Swiss cantons (i.e., states) enjoy considerable autonomy in determining the level of welfare benefits. This autonomy results in rich policy variation across and within the cantons over time, especially for our study population—refugees receiving subsidiary protection. Second, refugees are allocated to the cantons exogenously and proportionally to the cantons' population size, which for our analysis reduces the risk that changes in cantonal policy are endogenous to differential immigration shocks. Third and most importantly, refugees receiving subsidiary protection are obliged to remain in the canton to which they have initially been assigned, which eliminates bias from individuals sorting themselves into cantons with more favorable welfare regimes.

Our main specification exploits the within-person variation in the level of social assistance benefits over time, effectively comparing individuals exposed to welfare benefit changes that vary in strength and direction. In addition, we apply a difference-in-differences strategy to zoom in on two cantons, Zurich and Lucerne, where refugees with subsidiary

[1] In this study, the term refugee refers to internationally displaced persons who have obtained refugee status according to the Geneva Convention or some form of subsidiary protection.

protection experienced a sudden and marked change in social benefits by +43.6 percent in 2012 and –56.7 percent in 2015, respectively.

We find that higher welfare benefits for refugees reduce their likelihood of being charged with a criminal offense. Our intent-to-treat estimates imply that refugees are 0.072 percentage points less likely to be charged with a crime in a given quarter when their monthly welfare rate is 100 CHF (approximately 100 USD) higher, which translates to a 6 percent reduction at the sample mean. Compared to existing findings for non-refugee workers, the magnitude corresponds to around one-third of the effect of job displacement on crime (e.g., Rege et al., 2019; Britto et al., 2022), although benefit adjustments arguably differ in their psychological and social consequences from major shocks such as job loss. One conclusion that can be drawn from our analysis is that the crime rate among refugees with subsidiary protection would decrease by 27 percent if they received the same level of social assistance as non-refugees and recognized refugees, implying an elasticity of –0.34 at the sample mean. Adding to the policy relevance of our topic, we provide a simple back-of-the-envelope calculation suggesting that increases in welfare benefit rates could even reduce public spending through savings in policing, judiciary, and incarceration costs.

The difference-in-differences estimates for Zurich show that refugees' propensity to be charged with a crime dropped by 0.37 percentage points following the increase in monthly basic social benefits from 680 to 977 CHF in 2012. In Lucerne, the reduction in benefits from 986 to 427 CHF in 2015 led to an increase in criminal charges against refugees of 0.19 percentage points. While the overall crime effect for Lucerne is not significant at conventional levels, we observe a statistically significant increase in subsistence crimes. A series of alternative specifications, sample definitions, and estimation approaches confirm the robustness of the findings.

Leveraging the detailed penal codes provided by our data, we find that the overall effects are almost exclusively driven by a reduction in subsistence crimes, especially petty crimes, such as theft and small-scale drug dealing. These results are consistent with a subsistence mechanism, i.e., that benefits as low as those paid by some Swiss cantons are insufficient for refugees to cover their living expenses and may drive some individuals to seek alternative sources of income in the informal sector, including criminal activities. Indeed, we find that refugees' imputed disposable income (before crime) rose by 17% percent in Zurich and dropped by 75% percent in Lucerne after the policy changes in these cantons. While one might expect lower benefits to increase participation in the labor market (a common aim of such policies), we find little evidence of major effects on (short-term) employment outcomes in Switzerland. The lack of response can be ratio-

nalized by the low social assistance rates for the group of refugees studied here. [2] Thus, employment incentives are already high, while job opportunities for refugees are limited. Even five years after their arrival in Switzerland, only around one-third of refugees are in employment, which may be due to a combination of skills mismatch, lack of host country language proficiency, and labor market restrictions for refugees (e.g., Auer, 2018; Slotwinski et al., 2019; Ahrens et al., 2023a). Combining this with the finding that the effects are mainly driven by subsistence crime, we suggest that the effect of social assistance on crime primarily operates through its impact on refugees' liquidity constraints.

Our study contributes to multiple strands of research. First, it contributes to research on whether a larger presence of immigrants is associated with higher crime rates. Despite a sizeable body of scholarship, the findings on this issue are inconsistent (Bianchi et al., 2012; Bell et al., 2013; Fasani et al., 2019; Maghularia and Uebelmesser, 2023; Marie and Pinotti, 2024; Lange and Sommerfeld, 2024). One possible explanation is that contextual factors, particularly government policies, moderate the relationship between immigration and crime. Our findings suggest that the generosity and design of welfare systems may indeed play a role in reconciling some of the mixed findings with respect to the direction and strength of the effect of immigration on crime. Second, our study contributes to a rich literature on how refugee and immigration policies facilitate or impede refugee integration (Bahar et al., 2024; Brell et al., 2020; Foged et al., 2022a). Previous research has mostly focused on employment outcomes and has highlighted the role of restricted labor market access (Marbach et al., 2018; Slotwinski et al., 2019; Fasani et al., 2021; Ahrens et al., 2023a), the length of the asylum process (Hainmueller et al., 2016), geographic allocation (Bansak et al., 2018), networks (Martén et al., 2019; Egger et al., 2022), and language (Auer, 2018; Foged et al., 2022b). We complement this research by focusing on welfare benefits as another key policy dimension. Third, previous research on the effects of social aid for immigrants and refugees has mostly focused on employment and wages (Bahar et al., 2024; LoPalo, 2019). We extend this scope to an important and socially costly source of income from informal labor market participation and crime. We thus contribute to a small but growing literature that traces the effects of financial assistance on the criminal behavior of different populations (Jacob and Lefgren, 2003; Heller, 2014; Yang, 2017; Palmer et al., 2019; Britto et al., 2022; Deshpande and Mueller-Smith, 2022).

Closest to ours are two recent studies on Denmark. Dustmann et al. (2023) investigate the impact of a cut in social transfers in Denmark in 2002 on refugees' labor market and crime outcomes. While they find that the reduction in benefits led to an increase in refugee employment, they also show that the increase in labor supply could not offset the negative impact on disposable income. Consistent with our findings, they observe an associated rise in subsistence crimes. Foged et al. (2022b) study the effects of an earlier

[2] In addition to basic social welfare, refugees receive supplements for housing costs as well as medical care (both in kind). For permanent residents, the basic social benefits in most cantons amount to around 1,000 CHF plus supplements. The gross monthly earnings at the minimum wage equivalent are around 3,600 CHF.

reform in 1999, which combined additional language training with a temporary one-year welfare cut. The authors provide evidence that a (transient) reduction in disposable income was related to an increase in subsistence crime. Our study complements these two case studies on Denmark by leveraging a combination of incremental and dramatic changes in social welfare rates that occurred over a period of seven years in Switzerland, a country with pronounced socioeconomic and political heterogeneity. The Swiss setting thus allows to gauge the generalizability of the welfare–crime link in a different context. Our results add to the growing evidence that highlights the unintended consequences of welfare cuts on crime and the importance of the liquidity constraint mechanism for understanding criminal behavior more generally.[3]

We proceed as follows. Section 2 discusses the Swiss asylum system and contextualizes our empirical study. Before outlining our empirical strategy in Section 4, we describe the data in Section 3. Our findings are presented in Section 5. In Section 6, we investigate the underlying mechanisms and discuss the societal costs and benefits of higher social assistance. Section 7 concludes.

2 Background

2.1 The asylum procedure in Switzerland

The Swiss asylum procedure is structured similarly to that of many other European countries.[4] When a person enters Swiss territory and applies for asylum, they are assigned to a "reception and processing center", where they undergo identification, a medical check-up, and a first asylum interview. Asylum seekers obtain the permit N and usually spend up to three months in the reception centers before they are assigned and relocated to one of the 26 cantons, which are henceforth required to provide essential services (including housing, medical care, and social assistance).

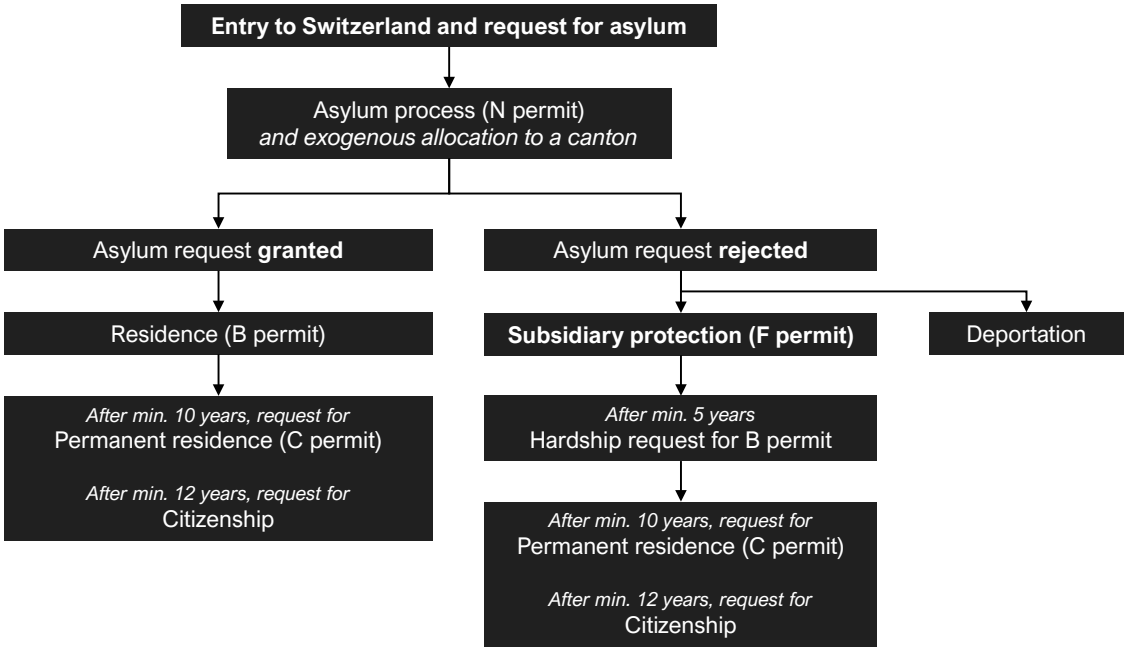
The Swiss asylum law requires that the allocation of refugees to the cantons is independent of individual characteristics and proportional to the cantons' population size, a feature that has been exploited by previous research (e.g., Auer, 2018; Bansak et al., 2018; Slotwinski et al., 2019; Schmid, 2023). Refugees' preferences for a particular canton do not affect the allocation decision. For instance, even second-degree family members already residing in a Swiss canton have no influence on the allocation decision of the placement

[3]Foley (2011) study the link between welfare payment timing and crime in US cities, and Britto et al. (2022) examine the effect of job loss on crime in Brazil. While focusing on other contexts, these studies also document that populations that are highly liquidity constrained may be pushed to illegal activities if they struggle with financial stability.

[4]Here we refer to the asylum procedure during our study period. Significant changes took place thereafter (in particular in 2019).

officers at the State Secretariat for Migration. The only economically relevant exceptions to the exogenous allocation are (first-degree) family reunification and medical conditions requiring treatment in a particular canton.[5] A detailed discussion of the assignment policy and evidence on the exogeneity of the allocation procedure is provided, for instance, in Martén et al. (2019), Auer and Kunz (2021), and Egger et al. (2022).

Figure 1: Asylum procedure in Switzerland



Note: Visualization of the key steps of the Swiss asylum process during the study period. Mobility restrictions (the ban on moving to another canton, temporarily or permanently) apply to individuals with subsidiary protection and to individuals with a B permit as long as they are dependent on welfare. The decision on the asylum claim is made by federal authorities and is independent of the canton to which the individuals have been assigned.

Figure 1 visualizes the key stages of the Swiss asylum procedure. Asylum seekers who receive a positive asylum decision are recognized as refugees and obtain a B permit, which may be converted into a C permit (permanent residence) after a minimum of ten years in Switzerland. Asylum seekers with a negative decision are either deported[6] or receive subsidiary protection (F permit), which applies if deportation is not legally or practically admissible, for example, due to security concerns in the country of origin. Individuals with subsidiary protection are subdivided into temporarily admitted foreigners (TAFs)

[5] In the empirical analysis, we adjust for individual fixed effects. This allows us to identify the impact of welfare benefits by accounting for any remaining potentially confounding (time-constant) unobservable factors.

[6] Of all individuals who claim asylum in Switzerland, around half do not enter the social security registry and therefore never benefit from social welfare or access to the labor market. These are primarily cases in which another Schengen country is responsible for processing the asylum request. In the other cases, the Swiss authorities reject the asylum request upon entry for formal reasons.

and temporarily admitted refugees (TARs).[7] Figure A.1 in the Appendix plots the development of status changes of the cohort of asylum seekers in 2009 (our first observation year). After two years, more than two-thirds of asylum seekers had been granted either refugee status (B and eventually C permit) or subsidiary protection status (F permit).[8]

TAFs, who are the focus of our analysis, can file a hardship request for a B permit after a minimum of five years. Yet, hardship requests are typically handled restrictively, and rarely lead to a residence permit. Figure A.3 in the Appendix shows that the probability of TAFs obtaining a B permit is generally below 1 percent for the first ten years after arrival, emphasizing that they usually retain their status over a considerable period.[9] Furthermore, during the study period, refugees were able to apply for citizenship after 12 years of residence in Switzerland, with equally narrow requirements. As a consequence of the restrictive permit change regulations, TAFs constitute the largest refugee group in Switzerland, accounting for 40 percent of the total refugee population.[10]

2.2 Cantonal welfare regimes

Social assistance is the primary source of welfare income for refugees.[11] According to official statistics, more than 80 percent of all TAFs receive social assistance (FSO, 2023b). The main objective of social assistance is to allow for a modest and dignified living standard, including social participation, covering daily expenditures such as food, clothing, energy consumption, housekeeping, transportation expenses, communication, education, entertainment, personal care, and equipment. While eligibility rules for asylum seekers, refugees, and the general population are federally regulated, the social assistance rates are determined by the cantons. Since the late 1990s, non-governmental organizations have provided guidelines on how to handle social assistance cases and have pushed for a harmonization of the benefit levels in the cantons (see Ferwerda et al., 2022 for details). In response, the cantonal standard social assistance rates for Swiss citizens, residence permit holders, and recognized refugees (i.e., B and C permit holders) were adjusted, but not those for asylum seekers and refugees with subsidiary protection (i.e., N and F permit holders). For the social assistance rates of these groups, the cantons still make use of their regulatory leeway, resulting in considerable policy variation. Furthermore, the cantons are obliged by federal law to set the social assistance rates for asylum seekers and refugees with subsidiary protection lower than the standard rate that applies to

[7] TARs receive subsidiary protection according to Article 33(1) of the Geneva Convention.
[8] Figure A.2 in the Appendix shows the distribution of registered individuals by permit type over time.
[9] Without having a B permit, TAFs cannot obtain a subsequent C permit even after ten years.
[10] During the observation period 2009–2016, 9 percent of the individuals with an asylum decision had a permanent residence permit (C), 38 percent had a residence permit (B), and 53 percent had subsidiary protection status (F permit). Among F permit holders, 76 percent were TAFs, and the rest were TARs.
[11] Residents in Switzerland are entitled to unemployment benefits if they have worked for at least 12 months over the previous two years. Because refugees have no employment history in Switzerland when seeking asylum, they are only entitled to social assistance.

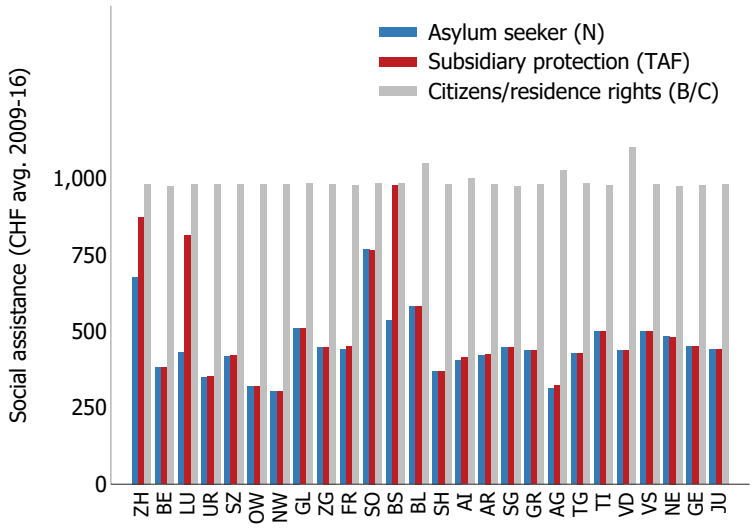
non-refugee residents and recognized refugees. The law does, however, not specify the exact reduction, thus giving the cantons significant leeway.

This study leverages an original panel dataset covering social assistance regulations by canton and refugee status over time. For this, we coded social assistance rates and other policy parameters (discussed below) from publicly available sources (e.g., cantonal laws and published guidelines) and confirmed the accuracy of our coding with representatives from the cantons.

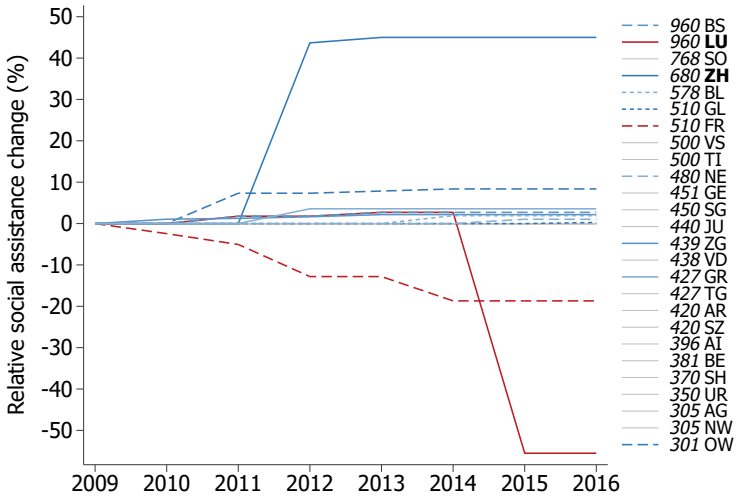
Figure 2 provides an overview of the cantonal social assistance provisions. Figure 2a reports the average social assistance rates during our study period for a single person by refugee status. Our policy data confirms that the standard rate for Swiss citizens, permanent residents, and recognized refugees varies little between cantons and is around 1,000 CHF per month. In all but one canton, the average welfare benefits for individuals with subsidiary protection are considerably lower than the benefits for accepted refugees and Swiss citizens. In 2009, for example, the basic amount of social assistance for TAFs was 301 CHF in the canton of Obwalden and 960 CHF in the cantons of Basel-City and Lucerne. Figure 2b visualizes the change in welfare benefits for TAFs over time by canton, standardized at the levels of 2009 (the beginning of our sample period). Besides several amendments of small to medium extent, two cantons stand out: the canton of Zurich increased the basic allowance from 680 CHF to 977 CHF in 2012, whereas the canton of Lucerne reduced it from 986 CHF to 427 CHF in 2015. This rich variation in the magnitude of social assistance changes helps us in identifying the effect of social assistance on crime, not just as a consequence of substantial income shocks but also in response to smaller changes. We leverage the two marked policy changes in separate difference-in-differences analyses.

In addition to the basic allowance, the monthly payout also depends on integration supplements, monetary sanctions, tax-free allowance, and benefits in kind. All of these policy parameters are set by the cantons and coded as part of our policy data collection. The integration supplement is paid to welfare recipients who are 16 years or older and show particular efforts for their social or professional integration. In 2012, 28 percent of welfare beneficiaries received this supplement of, on average, 213 CHF. If a beneficiary fails to comply with or violates their legal obligations, for example, in the event of a lack of labor market integration efforts or insufficient cooperation, the social assistance payment can also be reduced. Although sanctions are not consistently recorded, the analysis of individual case files in Ferwerda et al. (2022) suggests that they are generally very rare. In our data, we code both the integration supplement and the benefit cuts in terms of the potential maximum cash amount that can be applied (in CHF) to reward or sanction. Individuals in employment can also receive social assistance, but reductions are applied if the monthly income is above a canton-specific tax-free allowance. We record the tax-free allowance as the amount of income from employment (in CHF) up to which social benefits are not reduced proportionally. Finally, some cantons pay part of the social

Figure 2: Variation in social assistance by refugee status and canton



(a) SA by refugee status and canton



(b) Social assistance for TAFs over time

Note: **Figure (a)** plots the average monthly social assistance payments between 2009 and 2016 in all cantons for different population groups: asylum seekers with a pending asylum claim (N), refugees with subsidiary protection (F), and accepted refugees and immigrants with and without permanent residence permits (B/C), who receive the standard rate. **Figure (b)** depicts the percentage change in monthly social assistance benefits for TAFs in each canton relative to the benefit level in the baseline year 2009. The gray line indicates cantons without change in the social assistance rates during the observation period; blue lines indicate cantons with increases in the social assistance rates; and red lines indicate cantons with decreases in the social assistance rates. The legend specifies the baseline levels of monthly social assistance rates for TAFs in 2009.

assistance benefits in kind. These non-monetary payments include, among others, public transportation vouchers and mobile phone cards.

In our empirical analysis, we focus on the effect of changes in the basic allowance for single households, which is the primary determinant of the monthly benefits. While the social assistance rates vary over time, the accompanying policies show only little variation in our study period. For example, only one canton changed its payment-in-kind policy during the study period. Nevertheless, we consider these policies as controls in all specifications to ensure that estimates are not confounded by contemporaneous variation in accompanying policies (see table A.3 in the Appendix for summary statistics by canton).

3 Data

To estimate the effect of cantonal social assistance rates on crime, we link data from the central migration information system of the State Secretariat for Migration, discussed below, with data from the criminal charges registry, which is maintained by the Federal Statistical Office. The crime register contains all persons charged with committing a crime on a case-by-case basis, including details about the accused person, the crime's penal code, and the date and location of the incident. We combine this linked data with information on the level of social assistance in the respective canton to which the refugees were assigned in the respective quarter of the year.

3.1 Central migration information system

The central migration information system, hereinafter referred to as the migrant register, records all regular immigrants and refugees in Switzerland. It includes detailed information on each asylum case, including the date of application, the asylum decision, and the date of the decision. It also records sociodemographic information on every foreigner in the country. Individuals are tracked over time as long as they reside in the country, independent of whether their residence status changes up to and including naturalization.[12] Our main sample comprises all TAFs (33,934 individuals) who resided in Switzerland between January 2009 and December 2016. We only include individuals for whom the information on gender, permit, cantonal assignment, and canton of residence is not missing. We further exclude individuals who have resided in the country for more than ten years (as they might submit a request for permit residency and thus relax their mobility restrictions). We also exclude individuals who were younger than ten years at the time of observation (i.e., the minimum age for legal responsibility in Switzerland).

[12]The reference date of the data collection is December 31 of the respective year.

3.2 Criminal charges registry

The criminal charges registry contains all criminal charges recorded by the police forces. Each incident is assigned a case ID and includes police record information on the crime (e.g., penal code, place, date) as well as on the individual charged with the crime (e.g., gender, date of birth, place of residence, residence permit). Depending on the case and circumstances, each case can be associated with several penal codes.

The first outcome variable, *total crimes*, measures whether an individual is charged with any crime in a given quarter.[13] Importantly, the effect of social benefits on crime likely varies by the type of offense. We thus define four additional outcome variables, which pertain to different subcategories of crimes:

> *Subsistence crimes* include crimes related to income motives, such as drug dealing, robbery, theft, prostitution, and illicit labor.
>
> *Petty crimes* are a subset of subsistence crimes, capturing less severe and low-threshold illegal activities, such as shoplifting, repeated fare evasion, possession of small amounts of drugs, or bouncing.
>
> *Violent crimes* are any form of violent crime, including assault, rape, and homicide.
>
> *Other crimes* comprise all remaining crimes that cannot be clearly assigned to either violent or subsistence crimes. These are mainly rare specific offenses, such as failure to provide emergency assistance or defamation.

Appendix Table A.1 lists the main crime categories and documents the classification. For each crime category, we define an indicator that equals 100 (for readability) if the individual is accused of committing a crime that falls within the category in a given quarter and zero otherwise. Since the same incidence can be associated with multiple crimes, a person can have a record in more than one crime category for the same incident. Information on the distribution of charges by permit type and crime category is provided in Table A.2. The probability of being charged with a crime of any category is, on average, 1.19% in a given quarter.

Using a binary crime measure allows us to identify the extensive margin of the welfare–crime nexus, which is informative as it captures the transition into delinquency. In a complementary approach, we assess the effects on the severity of offenses. To this end, we construct a measure of crime severity using the range of sanctions specified for each (sub-)crime in the Swiss penal code. *Prison sentence* measures the minimum sentence

[13] We exclude charges of drug consumption as they are usually not driven by monetary motives. Moreover, in most cantons, cannabis consumption—by far the most prevalent drug in Switzerland—is only sentenced with a fine or not further prosecuted at all.

for a given charge in the penal code. The sanctions range from fines to several years of prison.[14] We assign each case the minimum sentence from the penal code and convert the fine sentences into prison days using official conversion keys that are applied to convicted who cannot or refuse to pay the fines.[15] If a person is charged with several crimes from different categories (e.g., subsistence crime in combination with a violent crime), we take the sum of the minimum sentence across categories within a quarter. If a person is accused of committing several crimes of the same category (e.g., three income-motivated thefts), we take the one with the highest minimum sentence, i.e., the severest crime within a quarter. The outcome variable is zero for individuals who were not charged with a crime in the respective crime category and quarter. The median implied prison sentence among individuals in our main sample who were charged with a crime is three years (the mean is six years and 251 days). Including zeros, on average, TAFs are charged for offenses that translate into 22.3 prison days per quarter.

There are two noteworthy caveats relating to the data. First, since there is no individual-level data on convictions in Switzerland, in our main analysis, we draw on the universe of criminal charges. To validate that criminal charges are a meaningful proxy for convictions, we draw on official statistics aggregated at the canton level. The coefficient estimate from regressing convictions on charges is 0.977 among foreigners, indicating that criminal charges and convictions are highly correlated. We visualize the relationship in Appendix Figure A.7.[16] Second, our data does not capture crimes that have never been detected or prosecuted. We thus underestimate the number of crimes, particularly for certain crime categories that often remain undetected or unreported (e.g., shoplifting). Yet, this concern, which is common in empirical studies of crime, should not bias our estimates of the effect of the level of welfare benefits on crime unless prosecution rates were to vary with welfare policies, which seems unlikely.

3.3 Linking the migration and the crime register

There exists no common identifier that would allow us to directly link refugees with the crime register. We thus resort to a probabilistic merge based on detailed demographic information. To this end, we identify individuals appearing in the migrant register in a specific quarter by unique combinations of [nationality × exact date of birth × gender ×

[14] For instance, severe cases of drug dealing are sentenced to at least one year of prison, whereas minor cases are fined with a minimum amount equivalent to one day in prison.

[15] In Switzerland, more than half of all inmates are on substitute custodial sentence, i.e., they did not pay the fine and were instead imprisoned (FSO, 2024). The strict ruling that fines are always converted into prison sentences in the event of non-payment becomes evident in the fact that even fare evasion is among the most frequently converted offenses.

[16] We compare official statistics on charges and convictions of foreigners at the canton level, which are available from the Federal Statistical Office (FSO, 2023a). The official published statistics come with some caveats (e.g., publication only once per year, mismatch in the timing of charges and convictions, appeals) and do not allow us to distinguish between refugees and other non-Swiss residents.

permit × postal code of residence]. Across all foreigners (including regular immigrants), 96.86 percent of these combinations are unique.[17] In the crime register, 98.85 percent of the observations are unique with regard to the combination of [nationality × exact date of birth × gender × permit × postal code of residence]. Since the crime register does not allow us to distinguish between foreigners with and without an asylum background, we perform the linkage of the refugee sample in the migrant register against all foreigners charged with a crime in the crime register (i.e., including non-refugees).[18] When performing the probabilistic merge, we allow one person to be assigned to multiple cases per quarter since persons can be charged with multiple crimes. Appendix Table A.2 provides summary statistics on the crime incidences and sociodemographic characteristics of the different groups of asylum seekers and refugees in our linked sample. In Section 5.4, we validate the probabilistic merge using an alternative estimation strategy, which is based on aggregate canton-level (i.e., unlinked) data. Since our main insights are confirmed with this alternative strategy, we conclude that the probabilistic linkage is unlikely to hamper the robustness of our results.

4 Empirical strategy

Our analysis focuses on temporarily admitted foreigners (TAFs), who reside in Switzerland under subsidiary protection. Throughout our analyses, we include TAFs regardless of whether they actually receive social assistance, implying that our estimates have an intention-to-treat (ITT) interpretation. However, given that more than 80 percent of TAFs receive social assistance (FSO, 2023b), our estimates provide a close lower-bound effect of actual welfare receipts.

Several features of the asylum system facilitate the identification of welfare policy effects for this particular refugee group. First, in contrast to refugees recognized under the Geneva Convention, TAFs are not allowed to move to another canton. The mobility restrictions are strictly enforced. Even unauthorized temporary relocations (if they last longer than 90 days) lead to fines and, in repeated cases, imprisonment. Because social assistance is tied to the registered place of living, this restrictive policy helps to rule out sorting into cantons with more generous welfare schemes. Second, cantons make use of their regulatory autonomy (backed by supreme court rulings) to set lower social assistance benefit levels for TAFs (and asylum seekers), while welfare policies for recognized refugees have been largely harmonized across Switzerland (see Figure 2a). Third, in contrast to

[17] Some of the remaining duplicate entries, which are excluded from the sample, may stem from undetected double entries generated when immigrants register in Switzerland, from coding errors by caseworkers in the foreign office, or from missing information (e.g., if the date of birth cannot be verified).

[18] A possible limitation of our linking strategy is within-year address change. While the migrant register records the address as of December 31, the crime register records the address on the date when the person is charged. We thus may fail to link individuals who changed their address within the year.

asylum seekers (whose status changes after the asylum decision), TAFs hold their status for a longer period and usually stay in the country permanently, despite their asylum applications being formally rejected. A longer status duration implies that individuals are more likely to experience a change in welfare generosity due to changes in cantonal policy. Focusing on TAFs thus allows us to gain insights into the effects of welfare benefits on criminal behavior, leveraging only within-person variation.

Our main specification for estimating the intent-to-treat effects of the level of social assistance on the criminal charges of TAFs is given by

$$C_{ict} = \tau SA_{ct} + X'_{ct}\gamma + \zeta_t + \mu_i + \eta_{(t-T(i))} + \varepsilon_{ict}, \tag{1}$$

where the individual i's crime outcome C_{ict} observed in canton c and quarter t is a function of social assistance transfers, SA_{ct}, which we measure in 100 CHF. We control for year–quarter (ζ_t) and individual (μ_i) fixed effects as well as fixed effects for years of residence in Switzerland $\eta_{(t-T(i))}$, where $T(i)$ denotes the year of arrival. We use linear fixed effects regressions for the dichotomous outcomes (i.e., a criminal charge in a given quarter). The prison sentence outcome is highly skewed; hence we use Poisson pseudo-maximum likelihood regression, which allows for multiway fixed effects (Correia et al., 2019). Including person fixed effects implies a conservative specification that exploits within-person variation and effectively compares individuals' exposure to policy changes while accounting for compositional changes that might arise from selective permit changes. The person fixed effects also absorb canton fixed effects as TAFs are generally forced to remain in the same canton. We also report results for a less restrictive specification with canton fixed effects, which leverages long-term comparisons across different cohorts. Given that the endogenous sorting of individuals across cantons is prohibited by the institutional setting, both specifications credibly identify the causal effect of social assistance levels on crime (and employment) outcomes.

As discussed in Section 2.2, social assistance, SA, is not the only welfare policy whose level is determined by the cantons. Accordingly, we control in all estimations for four related welfare policies collected in the vector X_{ct}: first, the maximum permissible benefit cut, which is measured as a share of the social assistance level and is applied to beneficiaries who do not comply with their obligations to cooperate with welfare services and to seek employment (with cuts ranging between 0 and 85 percent in the sample); second, the integration bonuses paid to welfare recipients for particular efforts to integrate into the labor market (0 to 400 CHF, measured in 100 CHF); third, the income allowance up to which income from employment does not lead to benefit cuts (0 to 600 CHF, measured in 100 CHF); and, fourth, a binary indicator for whether part of the social assistance benefits are paid in kind (see Ahrens et al., 2023a). The summary statistics of social assistance rates and related policies for our sample are provided in Appendix Table A.3.

Two policy changes stand out during our study period: an increase in social assistance

rates by almost 300 CHF in the canton of Zurich in 2012 and a decrease in social assistance rates by more than 500 CHF in the canton of Lucerne in 2015 (see Figure 2b). These significant changes allow us to exploit them as marked events in two difference-in-differences analyses by replacing the continuous SA measure employed in (1) with a binary treatment variable set to 1 after the welfare changes in Zurich and Lucerne. As a control group, we use (never-treated) cantons without variation in the social assistance rate during the study period. Both analyses account for individual, time, and residence duration effects, canton-by-quarter effects to capture seasonality, and—as before—controls for accompanying cantonal welfare policies.[19] For Zurich and Lucerne, we also employ event studies to assess pre-trends and potential anticipation effects, allowing us to validate the plausibility of the parallel trends assumption underlying the difference-in-differences analyses. The event study specifications are given by

$$C_{ict} = \sum_{\substack{h=-a \\ h\neq -4}}^{b-1} \tau_h \mathbb{1}\{K_{ct} = h\} + \tau_{b_+} \mathbb{1}\{K_{ct} > b\} + X'_{ct}\gamma + \zeta_t + \mu_i + \eta_{(t-T(i))} + \varepsilon_{ict}, \quad (2)$$

where $\mathbb{1}\{\cdot\}$ denotes the indicator function for the treated canton (Zurich or Lucerne) and K_{ct} is the number of quarters since the policy change. The event study window covers the a periods before the event and b periods after the respective policy change. b_+ corresponds to the long-run impact of the policy change.

In all our analyses, we cluster the standard errors at the cantonal level, i.e., the level of treatment assignment. Since there are only 26 cantons in Switzerland and only half of them show any variation in benefits, this approach might yield misleading confidence intervals. The cluster wild bootstrap (CWB) is a popular approach if the number of clusters is small (Cameron et al., 2008) but may still perform poorly if only a small number of clusters are treated or clusters substantially differ in size (MacKinnon and Webb, 2017), as is the case here. Thus, we also report p-values using cluster jackknife to estimate more robust p-values, which relies on the leave-one-cluster-out method and may be more robust to the presence of few high-leverage clusters (see MacKinnon et al., 2022; MacKinnon et al., 2023).

The main empirical strategy exploits the time variation presented in Figure 2b. A potential threat to identification could be due to confounding factors that are associated with welfare rate changes. For instance, policymakers might reduce welfare rates for TAFs to incentivize employment when labor demand is high. A similar bias could arise if cantonal changes in social assistance rates were a reaction to local refugee crime rates, perhaps due to political reasons. Figure A.4 in the Appendix shows that past levels of these two key factors as well as first differences are not systematically associated with cantonal social assistance rates in a given quarter. Moreover, in Appendix Figure A.6 we show that the local share of individuals with subsidiary protection is not related to the respective can-

[19] Note that we apply a linear specification to the prison sentence outcome in the DID setting.

tonal social assistance rates, which confirms that the asylum process and decision—for which federal authorities are responsible—is independent of local welfare regimes and that temporarily admitted persons do not sort into (financially) more conducive regions.

5 Results

5.1 Main results

Table 1 reports the results based on Equation 1 using either canton or individual fixed effects. According to Column (1), Panel A, the overall crime rate of TAFs is 0.034 percentage points lower in a quarter when the cantonal monthly social benefits are 100 CHF higher, which constitutes a decrease of 2.86 percent, evaluated at the sample mean of 1.19 (recall that the binary dependent variable is scaled by 100). The effect seems to be strongest for petty crimes, for which the effect size increases to –0.045 percentage points (or 8.04 percent at the mean of 0.56). This specification does, however, not account for baseline differences across individuals and unobserved factors driving individuals' propensities to emigrate or change their residence permit. In Panel B, we thus consider our preferred specification using individual fixed effects. As shown in Column (1) of Panel B, an increase in monthly social assistance by 100 CHF decreases the probability of TAFs committing any crime in a given quarter by 0.072 percentage points, implying a sizeable 6.05 percent drop in crime incidence measured at the outcome mean of 1.19.[20] Based on cluster-robust standard errors, the coefficient is statistically significant at conventional levels ($p = 0.004$). Cluster wild bootstrap and cluster jackknife, which are more robust when the number of clusters is small or the clusters are uneven, yield somewhat higher p-values of 0.102 and 0.085, respectively. Finally, we find similar effects when estimating the impact on crime severity, which we proxy for by the number of prison days, using a fixed effects Poisson model (column 2). The point estimate of -0.074 ($s.e. = 0.035$) translates into a reduction of around 7 percent or approximately 1.57 prison days per quarter when the monthly social benefits are 100 CHF higher.

[20] In Table B.3, we re-estimate our main models using logistic regression instead of OLS and find similar effect sizes.

Table 1: ITT effect of social assistance on criminal charges

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Panel A: Adjusting for canton fixed effects						
Social assistance	-0.034**	-0.059***	-0.022***	-0.045***	0.007	-0.014**
	(0.015)	(0.012)	(0.008)	(0.005)	(0.015)	(0.006)
Cluster robust	$p = 0.028$		$p = 0.010$	$p = 0.000$	$p = 0.631$	$p = 0.038$
CWB	$p = 0.220$		$p = 0.287$	$p = 0.094$	$p = 0.677$	$p = 0.277$
Jackknife CV3	$p = 0.200$		$p = 0.164$	$p = 0.000$	$p = 0.808$	$p = 0.062$
Observations	364,520	364,520	364,520	364,520	364,520	364,520
Canton FE	26	26	26	26	26	26
Policy controls	yes	yes	yes	yes	yes	yes
Panel B: Adjusting for individual fixed effects						
Social assistance	-0.072***	-0.074**	-0.068***	-0.087***	0.003	-0.020
	(0.024)	(0.035)	(0.016)	(0.019)	(0.009)	(0.018)
Cluster robust	$p = 0.004$		$p = 0.000$	$p = 0.000$	$p = 0.758$	$p = 0.256$
CWB	$p = 0.102$		$p = 0.100$	$p = 0.042$	$p = 0.964$	$p = 0.349$
Jackknife CV3	$p = 0.085$		$p = 0.010$	$p = 0.015$	$p = 0.781$	$p = 0.520$
			Policy controls			
Welfare cuts	-0.511	-0.832	0.051	-0.745	-0.427	-0.430
	(0.569)	(0.923)	(0.498)	(0.652)	(0.334)	(0.432)
Integration bonus	0.035	0.136*	0.051*	0.027	-0.000	-0.033**
	(0.038)	(0.082)	(0.029)	(0.027)	(0.035)	(0.016)
Income allowance	-0.145***	-0.169*	-0.079*	-0.040	-0.059	-0.058***
	(0.046)	(0.096)	(0.046)	(0.040)	(0.054)	(0.016)
In-kind benefits	0.434	2.554**	0.661	0.819	0.363	0.086
	(0.461)	(1.156)	(0.419)	(0.533)	(0.350)	(0.207)
Observations	362,247	364,520	362,247	362,247	362,247	362,247
Individual FE	33,934	33,934	33,934	33,934	33,934	33,934
Mean dep. var.	1.19	22.30	0.75	0.56	0.36	0.36
Estimator	OLS	Poisson	OLS	OLS	OLS	OLS

Note: OLS (columns 1, 3–6) / Poisson regression (column 2) effect of the level of cantonal social assistance (in 100 CHF) on the crime probability (x100), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. Sample restricted to TAFs who have resided in Switzerland no longer than 10 years. Panel A adjusts for canton fixed effects, Panel B for individual fixed effects. *All crimes* is an indicator that equals 100 if any crime has been committed in a given quarter. *Prison sentence* is defined as the minimum sentence of the crime in case of conviction converted to prison days. *Subsistence crimes* defines crimes with a clear income motivation. *Petty crimes* denote a subsample of income-related crimes. *Violent crimes* capture crimes that clearly involve violence and that do not contain a clear income motivation. *Other crimes* comprise all incidents that cannot be unambiguously categorized into either subsistence or violent crimes. All models adjust for related policies (welfare cuts as % of aid, integration bonuses in 100 CHF, income allowance in 100 CHF, dummy for benefits contributed partly in kind). SE clustered at canton level (N=26); CWB restricted. Significance levels based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

5.2 Heterogeneity by crime category and gender

Next, we explore heterogeneity across different crime categories and by gender. Table 1, Columns (3)–(6) reveal that the welfare–crime relationship is largely driven by financially motivated subsistence crimes (including theft, robbery, and drug dealing), while we find little evidence that violent crimes (e.g., assault, domestic violence) and other crimes respond to changes in welfare benefits. Petty crimes, i.e., small-scale, low-threshold financial offenses such as shoplifting, pickpocketing, but also fare evasion, respond particularly strongly to changes in the social assistance rates. The point estimate of -0.087 percentage points ($s.e.$ = 0.019) in Panel B implies a 15.5 percent drop in crimes at the outcome mean for an increase in monthly social assistance benefits by 100 CHF. The fact that we observe the strongest behavioural reactions to changes in social assistance in this category is consistent with petty crimes having relatively low entry barriers compared to, for example, organised drug dealing, which requires more preparation, criminal networks and criminal motivation. At the same time, petty crimes can serve as a means for perpetrators to meet their basic needs.

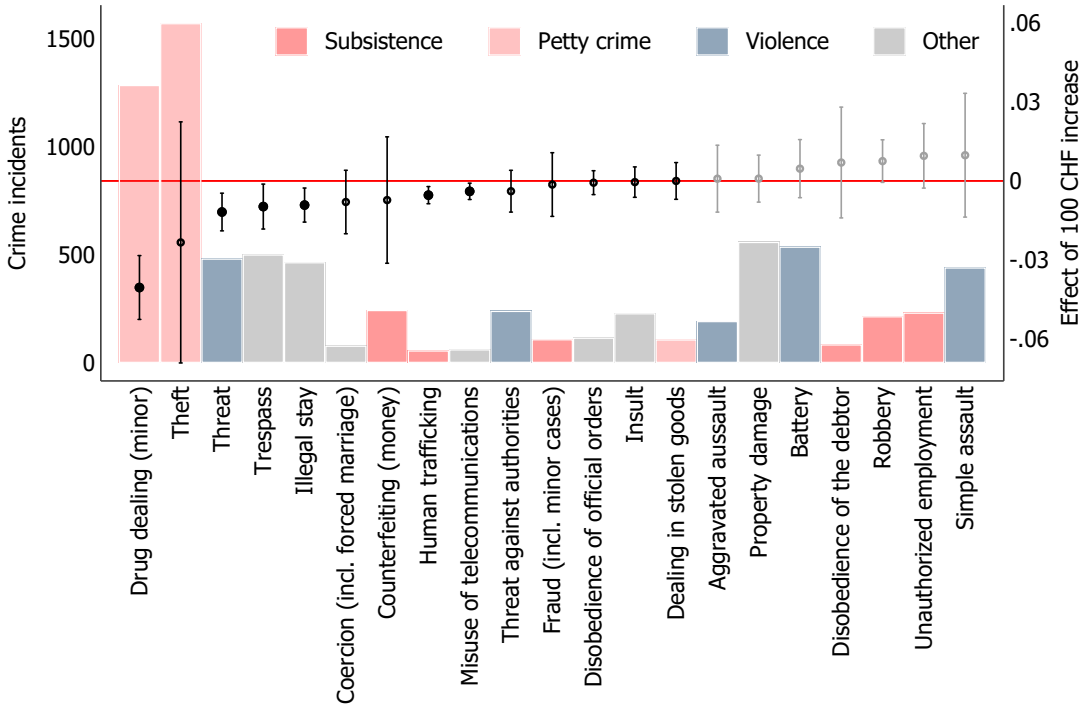
To gain a better understanding of the types of crime that drive the causal welfare–crime link, we additionally leverage the crime registry's fine-grained penal codes. We discard subcategories with fewer than 50 incidences over the sample period and combine crimes that fall under multiple legal panel codes but are conceptually similar, resulting in 21 crime subcategories (see Table A.1).[21]

Figure 3 shows the effects from estimating Equation 1 separately for each crime subcategory, along with their 95% confidence intervals. The subcategories are sorted by effect size in terms of percentage points (beginning with the largest reduction). Negative coefficients are shown in black and positive coefficients in gray. The bars correspond to the number of crime incidents over the period 2009–2016. Notably, (minor) drug dealing and theft, both classified as petty crimes, show the largest negative effect. They are also the crime subcategories with the largest number of incidences. It is noteworthy, however, that we also observe negative effects for threatening, trespassing, and illegal stay. These crimes are often associated with subsistence crimes. For instance, more than 90 percent of all burglary cases in the official registry also entail charges for trespassing. The same might apply to illegal stay (in another canton) since individuals might cross cantonal borders to commit crimes. Overall, crime subcategories associated with negative effects predominate, accounting for approximately 78 percent of all crime incidences in the sample.

There appears to be no systematic pattern for the effects on non-petty subsistence crimes, violent crimes, and other crimes, and some coefficients even turn out positive. We are,

[21] For instance, different kinds of theft fall under different penal codes, including 311.00.139.74 (shoplifting), 311.00.139.75 (pick-pocketing), and 311.00.172.39 (theft misdemeanor). We aggregate these different types into a joint category (theft).

Figure 3: Effect of social assistance on categories of criminal charges



Note: The figure shows ITT effects in percentage points (right vertical axis) for criminal charges by subcategories. Negative coefficients are marked in black and positive coefficients in gray. The sample of crimes is restricted to single crimes with at least 50 incidents among TAFs, covering 94 percent of all crime incidents in the sample. 95% CIs are clustered at the canton level.

however, reluctant to speculate about possible reasons as none of them is significantly different from zero at conventional levels.

Appendix Table B.1 documents effect heterogeneity with respect to gender. Consistent with the literature on criminal behavior (e.g., Grogger, 1998; Britto et al., 2022), the absolute effect is larger for men than for women. However, we also observe a change in subsistence and petty crime among women, with a relative effect size similar to that for men.

5.3 Difference-in-differences results for Zurich and Lucerne

Next, we turn to the difference-in-differences analyses for Zurich and Lucerne. These two cantons experience the two largest changes in SA in our observation period. Table 2 shows that the increase in social assistance benefits for TAFs by around 300 CHF in Zurich led to a decrease in their probability of being charged with a crime by 0.357 ($s.e.$ = 0.085) percentage points (panel A, column 1). The estimated effect of the policy change is thus slightly larger (in absolute terms) than what would be implied by the results estimate in

Table 1, i.e., $-0.072 \times 3 = -0.216$. Consistent with previous results, the observed effect in Zurich is largely driven by subsistence and petty crimes. The estimated effect for Lucerne (shown in panel B) is positive, indicating that the reduction in social assistance benefits by more than 500 CHF raised the crime rate of TAFs by 0.169 percentage points ($s.e. = 0.192$). This overall effect is smaller than the one implied by the results for the full sample, i.e., $-0.072 \times -5 = 0.360$ and not statistically significant. However, we observe statistically significant and economically large increases in subsistence crimes, i.e., for the kind of crimes we would expect behavioral responses to liquidity constraints.

Table 2: Difference-in-differences results for Zurich and Lucerne

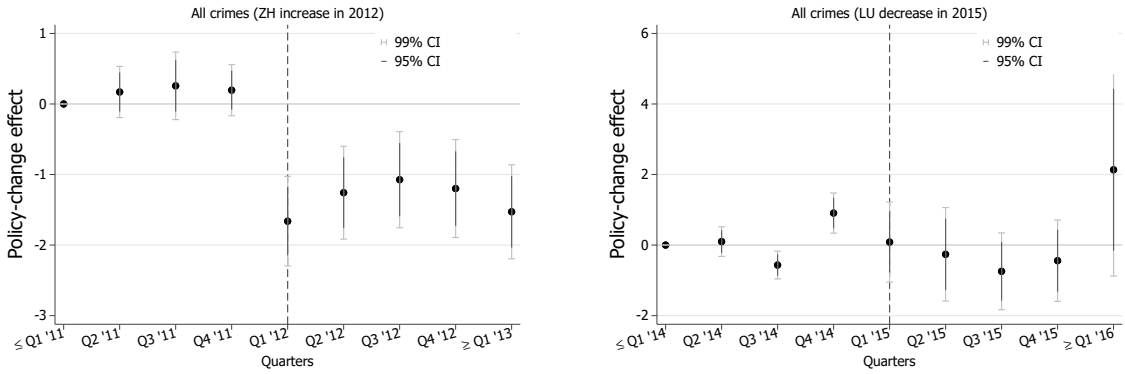
	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Panel A: Diff-in-diff setting, Zurich raise from 680 to 977 CHF in Q1, 2012						
Zurich × post-2012Q1	-0.370***	-0.034***	-0.383***	-0.289***	0.022	-0.131**
	(0.088)	(0.006)	(0.053)	(0.058)	(0.049)	(0.059)
Mean dep. var.						
Zurich pre	1.564	0.101	0.945	1.079	0.371	0.415
Control pre	1.158	0.072	0.537	0.722	0.384	0.340
Zurich post	1.455	0.084	0.670	0.967	0.399	0.382
Control post	1.097	0.065	0.498	0.671	0.342	0.379
Observations	342,364	342,364	342,364	342,364	342,364	342,364
Individual FE	32,138	32,138	32,138	32,138	32,138	32,138
Panel B: Diff-in-diff setting, Lucerne cut from 986 to 427 CHF in Q1, 2015						
Lucerne × post-2015Q1	0.193	0.012	0.270***	0.289***	0.001	-0.060
	(0.137)	(0.009)	(0.082)	(0.089)	(0.077)	(0.050)
Mean dep. var.						
Lucerne pre	1.490	0.093	0.883	1.033	0.380	0.378
Control pre	1.124	0.069	0.531	0.707	0.358	0.340
Lucerne post	1.498	0.084	0.526	0.950	0.407	0.424
Control post	1.107	0.064	0.472	0.651	0.353	0.419
Observations	291,937	291,937	291,937	291,937	291,937	291,937
Individual FE	27,338	27,338	27,338	27,338	27,338	27,338

Note: OLS effect of cantonal social assistance for TAFs on their likelihood of committing crime (x100) in a difference-in-differences setting, adjusted for individual, year–quarter (N=32), canton–quarter, and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample comprises TAFs who reside in Switzerland no longer than 10 years. The control group comprises all cantons without variation in the social assistance rate. All models adjust for related policies (welfare cuts as % of aid, integration bonuses in CHF, income allowance in CHF, dummy for benefits contributed partly in kind). SE clustered at canton level (N=17). Significance levels based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Next, we explore the dynamic effects of the policy changes in Zurich and Lucerne. Figure 4 presents the results with a focus on the overall crime incidence using a window of ± 12 quarters around the policy change. The event study for Zurich (left plot) indicates

that the policy change had an immediate and strong negative effect and a lasting long-term effect. The event study for Lucerne (right plot) shows no clear immediate effect but a positive long-term effect. This suggests that while increases in social assistance rates immediately alleviate financial constraints (Zurich), a longer adjustment period is required before welfare reductions are compensated through increased criminal activities (Lucerne). In Appendix Figure B.1 and Figure B.2, we also present event studies for each individual crime category, which also show no clear pre-trends and thus provide further support for the assumption of parallel trends underlying our difference-in-differences estimations. Together, the two analyses provide consistent evidence that TAFs are less likely to commit crimes when they receive higher social assistance benefits.

Figure 4: Event studies exploiting changes in social welfare policy in Zurich and Lucerne



(a) Event study: Zurich vs. control

(b) Event study: Lucerne vs. control

Note: Figure (a) Increase in welfare benefits in the canton of Zurich from 680 CHF to 977 CHF in Q1 of 2012. Figure (b) Reduction in welfare benefits in the canton of Lucerne from 986 CHF to 427 CHF in Q1 of 2015. In both event studies, the control group comprises all cantons without changes in the social assistance rate.

5.4 Further robustness checks

Measurement of social assistance

In our main specification, we use the absolute amount of social assistance to measure cantonal welfare generosity. However, the absolute values in nominal CHF do not take into account possible differences in the cost of living between cantons (e.g., price of services and groceries). To probe the sensitivity of our conclusions concerning this issue, we account for cantonal variation in price levels by defining the ratio between the social assistance rate for TAFs and that for permanent residents in each canton. Table B.2 in the Appendix summarizes the results, which are all in line with our main findings. Another implication of Appendix Table B.2 is that, if TAFs were paid the same social assistance rates as other residents, their crime rate would decrease by 27 percent.[22]

[22]The sample average in the ratio of social assistance rates for TAFs to social assistance rates for other residents is 56 percent. This implies an elasticity of -0.34 at the sample mean.

Leave-one-canton-out

Our empirical specification in Equation 1 relies on cantonal variation over time in welfare generosity. As Table 2b illustrates, the cantons exhibit significant differences in policy variation, with several cantons experiencing no change during the observed period. To validate our results, first, we show that the estimates do not change when restricting the sample to cantons in which there has been at least one change in welfare benefits for TAFs (panel A in table B.4). Second, we perform a leave-one-out exercise, showing that the estimates are not sensitive to the omission of single cantons (see appendix figure B.3).

Impact of linkage quality

As described above, due to the absence of a unique personal identifier that is common to both the crime and the migrant register, we employ probabilistic linkage based on unique combinations of individual characteristics. Even though the share of unique combinations in our data is very high ($> 95\%$), one might be concerned that the linkage quality could be associated with the level of social assistance, thereby introducing a systematic bias.

To check whether our findings could be influenced by selective linkage bias, we examine the robustness of our main results at the aggregate level. For this, we use crime incidence data from the complete set of charges in the register, regardless of whether these can be linked to the migrant register. On this basis, we calculate the crime rate for F permit holders (i.e., both TAFs and TARs) using the permit identifier available in the crime register. We divide the total criminal charges for F permit holders in a specific canton and quarter by the pre-linkage count of individuals in this group within the migrant register. While this approach represents a slight deviation from our main model—as it cannot isolate the impact of changes in social assistance rates *within* refugees—it allows us to compare aggregate-level outcomes with our individual-level fixed effects analyses. Panel A in Table B.6 presents the estimates accounting for quarter and cantonal fixed effects as well as other welfare-relevant policies. In Panel B, we also report the results based on the log number of crimes. The results show that 100 CHF higher social benefits are associated with a 4 percent reduction in the number of subsistence crimes, which is consistent with our main findings. We interpret these aggregate-level estimates as evidence that the linking procedure does not bias our main results.

External validity

Given the observed policy variation and existing mobility restrictions, our analysis primarily concentrates on TAFs. However, one could argue that our findings for TAFs do not generalize to other refugee populations, e.g., refugees recognized under the Geneva Convention. TAFs face higher levels of insecurity, are exposed to more restrictive regulations on labor market access, and are subject to a less generous welfare regime. For example, the fact that their status is insecure could reduce their propensity to crime

because obtaining permanent residence after 10 years depends, among other things, on a clean criminal record. To assess whether our findings generalize to recognized refugees, we replicate our main analysis for this group (i.e., B and C permit holders) with up to 10 years of residence. The estimates, presented in Appendix Table B.5 point in the same direction as our main estimates but are less precise. The limited precision might be driven by the markedly smaller variation in the standard level of social assistance for recognized refugees compared to the variation in social assistance rates for TAFs. The estimates should also be treated with caution as the mobility restrictions do not apply to this group, implying that B and C permit holders could potentially relocate to cantons with generous welfare schemes.

6 Discussion

In this section, we discuss two central implications of our main findings. First, we examine the role of labor market outcomes including employment and earnings as possible mechanisms through which welfare affects crime. Second, we trace the fiscal implications of our findings using a simple back-of-the-envelope calculation.

6.1 The role of labor market outcomes

To explore how labor market outcomes might mediate—or at least accompany—the effect of welfare benefits on crime among refugees, we use data from the register of the social security compensation funds (AHV). This data records (formal) employment status and earnings based on pension fund contributions for all workers in Switzerland.[23] We link the social security data with the population registry to create a quarterly panel of all individuals with subsidiary protection who have resided in the country for 10 years or less.[24] We use the same estimation model as in Equation (1), including individual, year–quarter, and years-since-arrival fixed effects. As outcome variables, we consider an employment indicator, total quarterly earnings (including non-employed), log quarterly earnings (of the employed), and imputed disposable income after social benefit receipts

[23] By law, social security contributions are mandatory from age 18 until retirement if the annual income exceeds 2,300 CHF, which amounts to roughly one-third of the average monthly full-time wage in Switzerland.

[24] In this data, we only observe whether refugees have an F permit. Within the group of F permit holders, we cannot distinguish between TAF and TAR status. TARs, however, only account for roughly 10 percent of the population with an F permit. Since TARs are not affected by the changes in the social assistance rate for TAFs, this analysis will likely be slightly downward biased. The data for this analysis was obtained through a separate data linkage request that only covers the years 2010 through 2015.

but before taxes.[25]

Table 3: Difference-in-differences estimates of social welfare changes on labor outcomes in Zurich and Lucerne

	Zurich (increase in January 2012)			Lucerne (decrease in January 2015)		
	Employed (×100) (1)	Earnings tot. (IHS) (2)	Disposable inc. (IHS) (3)	Employed (×100) (4)	Earnings (IHS) (5)	Disposable inc. (IHS) (6)
Policy change	-0.258	-0.071	0.172***	-0.513	-0.044	-0.750***
	(1.078)	(0.103)	(0.031)	(0.739)	(0.069)	(0.019)
Cluster-robust	$p = 0.811$	$p = 0.494$	$p = 0.000$	$p = 0.487$	$p = 0.518$	$p = 0.000$
CWB	$p = 0.837$	$p = 0.558$	$p = 0.000$	$p = 0.508$	$p = 0.550$	$p = 0.000$
Jackknife CV3	$p = 0.565$	$p = 0.451$	$p = 0.324$	$p = 0.466$	$p = 0.493$	$p = 0.318$
Mean dep. var.	20.401	1.864	7.310	20.944	1.916	7.226
Observations	241,296	241,296	241,296	201,988	201,988	201,988
Individual FE	21,458	21,458	21,458	18,005	18,005	18,005

Note: The table shows the effects of the increase in social assistance benefits by 297 CHF in Zurich in January 2012 and the reduction by 559 CHF in Lucerne in January 2015. Results are from difference-in-differences estimations. The outcome variables are employment (in columns 1 and 4), total earnings (columns 2 and 5) and disposable income (columns 3 and 6). All specifications include individual, year–quarter, and residence duration fixed effects. The control group comprises all cantons without variation in the social assistance rate. All models adjust for related policies (welfare cuts as % of aid, integration bonuses in CHF, income allowance in CHF, dummy for benefits contributed partly in kind). SE clustered at canton level (N=18); CWB refers to the restricted cluster wild bootstrap. Significance levels based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Table 3 reports the results from the same difference-in-differences specification applied to the policy changes in Zurich and Lucerne as above. Our estimates suggest that the effects of welfare benefits changes on employment and total earnings are small and statistically insignificant. In contrast, the effect on disposable income, which is driven by the increase (decrease) in welfare benefits, is, as expected, positive (negative) in Zurich (Lucerne). The limited effects on employment suggest that reservation wages as determinants of labor supply are only of secondary importance in our context. Instead, the lack of response to changes in social assistance payments might indicate that, independent of the social assistance levels, a sizeable share of refugees is unable to find employment due to frictions in the labor market, for example, as a result of a mismatch in professional and language skills (Auer, 2018) or specific employment restrictions for refugees (Marbach et al., 2018; Ahrens et al., 2023a). We provide event studies for Zurich and Lucerne in Appendix C.1, which confirm our finding for all three outcomes, i.e. employment, earnings, and disposable income. Table C.1 exploits variation in the social assistance rate across all cantons. We do not find evidence for strong responses either. Moreover, the impact on disposable income is no longer systematic.

[25] Based on our policy data and the administrative records, we can calculate realized social aid payments as max(cantonal social assistance - max(income+unemployment income-free tax allowance,0),0). The gross disposable income before tax is the sum of labor income and (predicted) social aid.

6.2 Can more generous benefits be cost efficient?

We also provide a back-of-the-envelope calculation on the fiscal implications of increasing social assistance. In our main specification, we estimate that a 100 CHF increase in monthly social assistance benefits reduces equivalent prison time by 1.6 days per quarter or about 6.4 days per year. In 2013, roughly the mid-point of our study period, the average cost per prisoner in Switzerland was 390 CHF per day (Wanner, 2013). Taking these numbers at face value, our results suggest that increasing social assistance can be an effective strategy for reducing overall fiscal costs. Specifically, the additional costs from increasing social assistance benefits by 100 CHF per month ($12 \times 100 = 1,200$ CHF p.a.) would be outweighed by fiscal savings from fewer prison stays ($6.4 \times 390 = 2,496$ CHF). As we do find limited evidence for labor market effects, it is unlikely that an increase in social assistance benefits would lead to large forgone revenues from, for example, income taxes. On the one hand, this estimate might represent an upper bound, because not all individuals charged with crimes serve prison time (as charges may be dismissed or sentences may be resolved through fines).[26] On the other hand, this back-of-the-envelope calculation does not account for additional costs incurred by the justice system (court fees, etc.) or by society. Thus, even without considering the broader social repercussions of crime, such as physical and psychological harm (e.g., Linden and Rockoff, 2008; Blanco and Ruiz, 2013), this back-of-the-envelope calculation weakens the fiscal argument for reducing welfare benefits for refugees.

7 Conclusion

We contribute to the debate on welfare generosity for refugees by analyzing the impact of social assistance on refugees' criminal behavior. Our empirical analyses focus on Switzerland because it provides an ideal study setting for several reasons. Refugees arriving in Switzerland are exogenously assigned to the different cantons, which in turn have considerable autonomy in determining the level of welfare benefits. Furthermore, refugees with subsidiary protection are obliged to remain in the cantons to which they have been assigned, which is why sorting to cantons with more generous welfare benefit schemes can be ruled out.

We collect original data on the cantonal social assistance rates, combine it with individual administrative data on the asylum process, and link these data to criminal charges registered by the police. Our panel regressions exploiting within-person variation in social assistance over time show that the likelihood that a refugee is charged with a crime

[26] Unpaid fines result in replacement incarcerations, which in turn constitute more than half of all prison sentences in Switzerland. In our sample, where liquidity shortages appear to be the primary driver of criminal behavior, it is reasonable to assume that the vast majority of charges result in (replacement) incarceration.

decreases in the level of welfare benefits. Two difference-in-differences analyses examining cases of cantons with sudden and substantial rate changes corroborate the direction of the welfare–crime link. When breaking down the relationship by crime category, we find that the overall effect is almost exclusively driven by a reduction in subsistence crimes, particularly petty crimes such as low-level drug dealing and theft, which are characterized by a low entry threshold.

How can we explain these findings? In our study, sharp cuts in welfare benefits led to a decrease in refugees' disposable income, which is in line with Dustmann et al. (2023) and Foged et al. (2022b). This suggests that the often-stated policy goal of encouraging labor force participation through lower social benefits may remain elusive. The lack of response on labor supply could indicate that refugees' reservation wages are already below the offered wages, yet many refugees still struggle to find employment, for example, due to language barriers (Auer, 2018) and policies restricting labor market access (Marbach et al., 2018; Ahrens et al., 2023a).

Our findings also have implications for public policy. Our back-of-the-envelope calculation suggests that, from a societal perspective, offering higher welfare benefits is likely to pay off: not only in terms of security but also in terms of public finances due to savings in incarceration costs. One factor that the back-of-the-envelope calculation does not take into account are general equilibrium effects triggered by refugees moving to localities with higher benefits. While Ferwerda et al. (2022) find very limited evidence that immigrants residing in Switzerland systematically move to municipalities with higher benefits, this does not speak to the question of whether refugees arriving from abroad would be more likely to favor Switzerland over comparable countries if cantons provide more generous social assistance.

The policy implications may have relevance beyond Switzerland. A comparative analysis of welfare benefits across Europe, as documented by Ahrens et al. (2023b), reveals that many countries provide similarly low social assistance rates for refugees with subsidiary protection as Switzerland. While neighboring Austria and France pay 385 EUR and 396 EUR, respectively, benefit rates can be as low as 77 EUR in Romania (2016 rates, all PPP-adjusted). This suggests an untapped potential for many European countries to simultaneously improve refugees' material situation and public safety by increasing the welfare benefits for asylum seekers and refugees.

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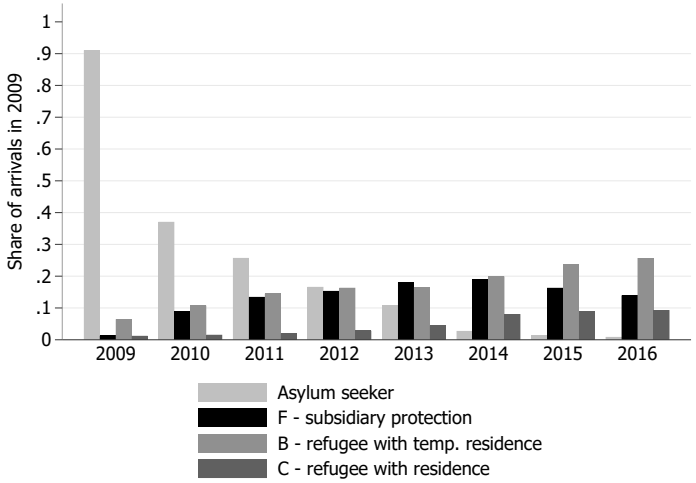
Online Appendix

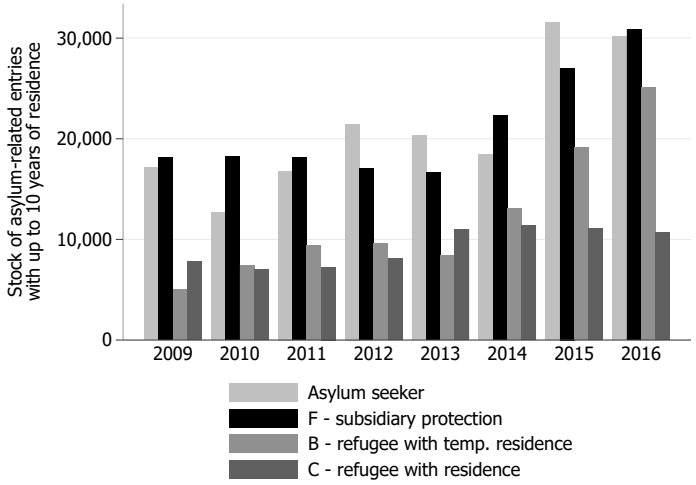
A Additional data information

Figure A.1: Changes in residence status of asylum seekers who arrived in 2009



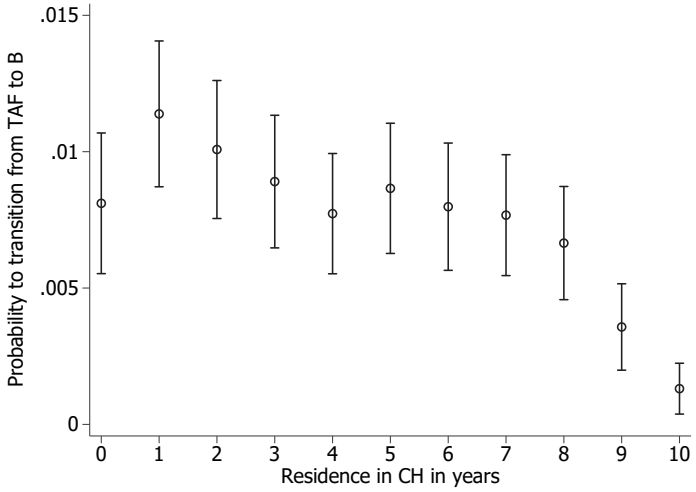
Note: Shares of individuals who arrived in Switzerland as asylum seekers in 2009 by residence status registered on December 31 of a given year. Roughly 50 percent of asylum seekers are deported to the Schengen country that is responsible for processing the asylum request or do not enter the asylum system registry for other reasons (e.g., asylum claim rejected at the border).

Figure A.2: Stock of registered individuals



Note: Number of individuals in the asylum system by residence status as registered on December 31 of a given year. The sample is restricted to individuals with a residence duration in Switzerland of 10 years or less.

Figure A.3: Probability of changing from F permit to B permit



Note: The figure shows the probability of TAFs changing from subsidiary protection status (F permit) to residence status (B permit), typically via a hardship request, by years of residence in Switzerland. Logistic regression. 95% CI clustered at the individual level.

Table A.1: Documentation of crime coding

Penal code	Crime description	Subsistence crimes	Petty crimes	Violent crimes	Other crimes
14220023	Other violations of foreign law				x
14220066	Unauthorized employment	x			
14220077	Unauthorized employment of foreigners	x			
14220088	Human trafficking	x			
14220099	Illegal stay				x
31100111	Homicide			x	
31100122	Aggravated assault			x	
31100123	Simple assault			x	
31100126	Battery			x	
31100128	Failure to provide emergency help				x
31100135	Portrayals of violence				x
31100136	Administering hazardous substances to children				x
31100137	Unlawful appropriation	x	x		
31100138	Embezzlement	x	x		
31100139	Theft	x	x		
31100140	Robbery	x			
31100141	Appropriation of property	x	x		
31100144	Property damage				x
31100146	Fraud (incl. minor cases)	x	x		
31100150	Unauthorized use of a service	x			x
31100156	Blackmailing	x			
31100157	Profiteering and disloyal management	x			x
31100160	Dealing in stolen goods	x	x		
31100173	Slander				x
31100174	Defamation				x
31100177	Insult				x
31100179	Misuse of telecommunications				x
31100180	Threat			x	
31100181	Coercion (incl. forced marriage)			x	x
31100183	Abduction and kidnapping			x	
31100186	Trespass				x
31100187	Sexual acts with minors				x
31100188	Sexual assault			x	
31100190	Rape			x	
31100191	Desecration			x	
31100194	Exhibitionism				x
31100195	Prostitution	x	x		
31100197	Pornography				x
31100198	Sexual harassment			x	
31100217	Neglect of support obligations				x
31100221	Arson			x	
31100237	Disruption of public traffic				x
31100240	Counterfeiting (money)	x			
31100259	Public incitement to crime or violence				x
31100261	Disturbance of freedom of belief and worship				x
31100263	Committing an act in self-inflicted incapacity				x
31100285	Threat against authorities			x	
31100292	Disobediance of official orders				x
31100303	False accusation				x
31100305	Money laundering	x			
31100322	Bribe	x			
31100323	Disobediance of the debtor	x			
31100332	Failure to report a finding	x			
81212101	Drug dealing (minor)	x	x		
81212109	Drug dealing (organzied)	x			

Note: Crime aggregated at the level of the legal article. If two or more articles are grouped together, we report the penal code of the main crime. The detailed coding for each single crime at the subparagraph level is available in the replication materials.

Table A.2: Summary statistics by residence status

	Accepted refugees (B/C)	Temporary accepted (F)	Asylum seekers (N)
All crimes (in quarter $t\times100$)	0.822	1.188	1.187
	(0.014)	(0.018)	(0.015)
Subsistence crimes	0.454	0.750	0.757
	(0.010)	(0.014)	(0.012)
Petty crimes	0.296	0.561	0.626
	(0.008)	(0.012)	(0.011)
Violent crimes	0.307	0.359	0.226
	(0.008)	(0.010)	(0.007)
Other crimes	0.248	0.365	0.486
	(0.008)	(0.010)	(0.010)
Min. prison sentence (days)	13.441	22.300	29.131
	(0.486)	(0.655)	(0.679)
SA (in 100 SFr/month)	9.950	5.571	4.805
	(0.001)	(0.004)	(0.002)
SA (ratio to standard rate)	1.000	0.562	0.484
	(.)	(0.000)	(0.000)
Female (indicator)	0.431	0.420	0.316
	(0.001)	(0.001)	(0.001)
Age	30.183	30.424	28.191
	(0.018)	(0.023)	(0.014)
Married (indicator)	0.372	0.259	0.228
	(0.001)	(0.001)	(0.001)
Duration of stay (years)	4.672	4.625	1.183
	(0.004)	(0.005)	(0.002)
Pr. to ever change residence canton	0.072	0.053	0.079
	(0.000)	(0.000)	(0.000)
Observations	427,682	364,520	524,868
Individuals	32,169	33,934	88,163

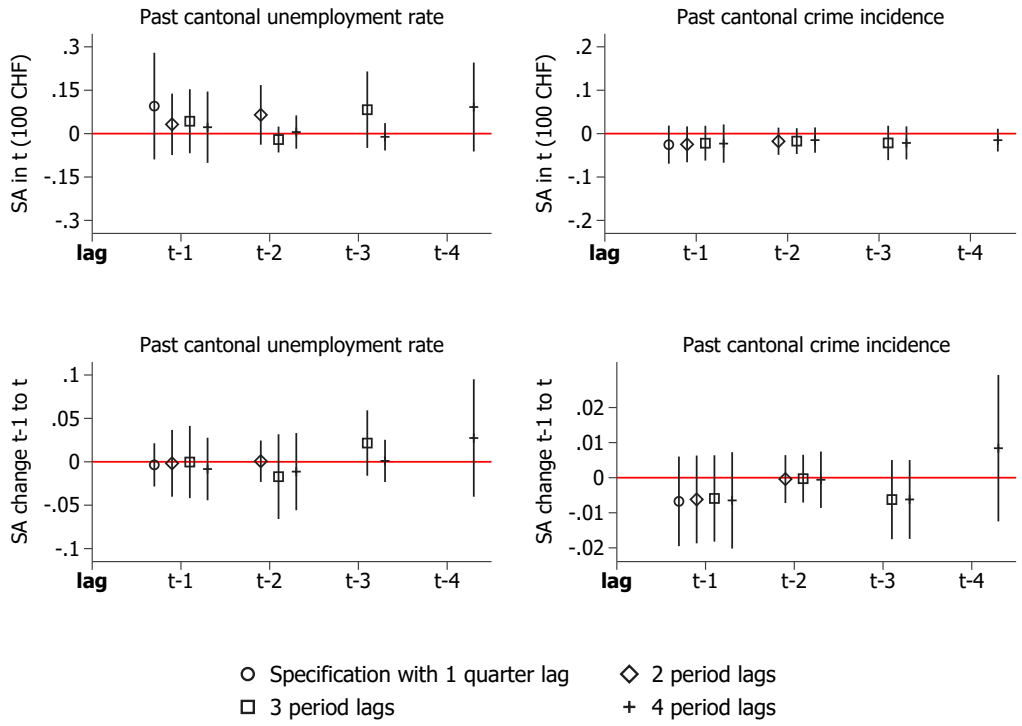
Note: Person–quarter observations 1/2009 – 4/2016. Samples are restricted to individuals with 10 years or less residence in Switzerland. Crime incidence $\times100$. *All crimes* is an indicator that equals 100 if any crime has been committed in a given quarter. *Subsistence crimes* defines crimes with a clear income motivation. *Petty crimes* denote a subsample of income-related crimes. *Violent crimes* captures crimes that clearly involve violence and that do not contain any income motivation. *Other crimes* comprise all incidents that cannot be unambiguously categorized into either subsistence or violent crimes. *Prison sentence* is defined as the minimum sentence of the crime in case of conviction converted to prison days. Standard errors robust to heteroskedasticity in parentheses.

Table A.3: Summary statistics of policy measures by canton

		Social assistance	SA min/max	Welfare cuts	Integration bonus	Income allowance	In-kind payments
Zurich	ZH	8.788	6.800	0.163	300	400	0
		(1.450)	9.860	(0.065)	.	.	.
Bern	BE	3.812	3.812	0.120	0	245.739	0
		.	3.812	.	.	(49.819)	.
Lucerne	LU	8.082	4.270	0.168	200	500	0
		(2.516)	9.860	(0.053)	.	.	.
Uri	UR	3.507	3.507	0	0	250	0
		.	3.507	.	.	.	.
Schwyz	SZ	4.200	4.200	0.218	0	0	0
		.	4.200	.	.	.	.
Obwalden	OW	3.194	3.012	0.169	90	425	0
		(0.103)	3.264	(0.050)	.	.	.
Nidwalden	NW	3.050	3.050	0.200	0	600	0
		.	3.050	.	.	.	.
Glarus	GL	5.102	5.100	0.176	0	400	0.731
		(0.009)	5.147	.	.	.	(0.444)
Zug	ZG	4.464	4.395	0.149	256.801	513.601	0
		(0.033)	4.490	(0.001)	(102.588)	(205.176)	.
Fribourg	FR	4.541	4.150	0.261	145.121	393.494	0
		(0.391)	5.480	(0.068)	(26.612)	(35.482)	.
Solothurn	SO	7.680	7.680	0.150	333.986	533.986	0
		.	7.680	.	(94.052)	(94.052)	.
Basel-Stadt	BS	9.805	9.600	0.150	100	400	0
		(0.093)	9.860	(0.001)	.	.	.
Basel-Land	BL	5.827	5.780	0.146	229.691	400	0
		(0.054)	5.890	(0.028)	(197.791)	.	.
Schaffhausen	SH	3.700	3.700	0.243	0	500	0
		.	3.700	.	.	.	.
Appenzell-I.	AI	3.965	3.965	0	125.355	0	0
		.	3.965	.	(148.112)	.	.
Appenzell-A.	AR	4.200	4.200	0.179	0	400	0
		.	4.200	.	.	.	.
St. Gallen	SG	4.500	4.500	0.339	144.618	400	0
		.	4.500	.	(15.496)	.	.
Graubuenden	GR	4.368	4.270	0.298	0	103.597	0
		(0.073)	4.423	(0.019)	.	(175.245)	.
Aargau	AG	3.050	3.050	0.250	0	0	1
		.	3.050	.	.	.	.
Thurgau	TG	4.270	4.270	0.429	0	400	0
		.	4.270	.	.	.	.
Ticino	TI	5.000	5.000	0.400	0	307.353	0
		.	5.000	.	.	(143.817)	.
Vaud	VD	4.380	4.380	0.856	0	0	1
		.	4.380	.	.	.	.
Valais	VS	5.000	5.000	0.400	0	400	0
		.	5.000	.	.	.	.
Neuchatel	NE	4.814	4.800	0	200	338.320	0
		(0.022)	4.850	.	.	(48.620)	.
Geneve	GE	4.510	4.510	0.335	300	500	0
		.	4.510	.	.	.	.
Jura	JU	4.400	4.400	0	0	400	0
		.	4.400	.	.	.	.

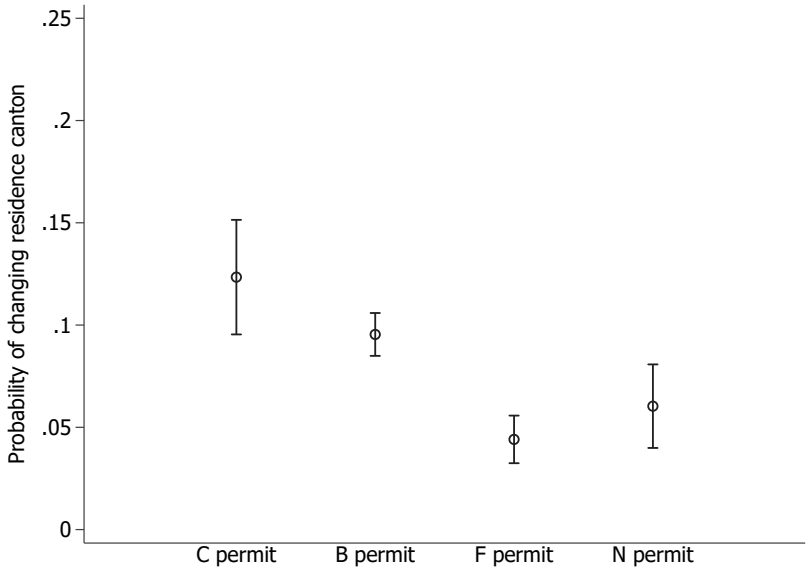
Note: The table shows averages of social assistance rates and related policies by canton in the main sample (i.e., TAFs with up to 10 years of residence, 2009–2016). SD in parentheses; social assistance minimum/maximum. Ordering according to the coding by the Federal Statistical Office.

Figure A.4: Association between cantonal social assistance rate and past unemployment, crime



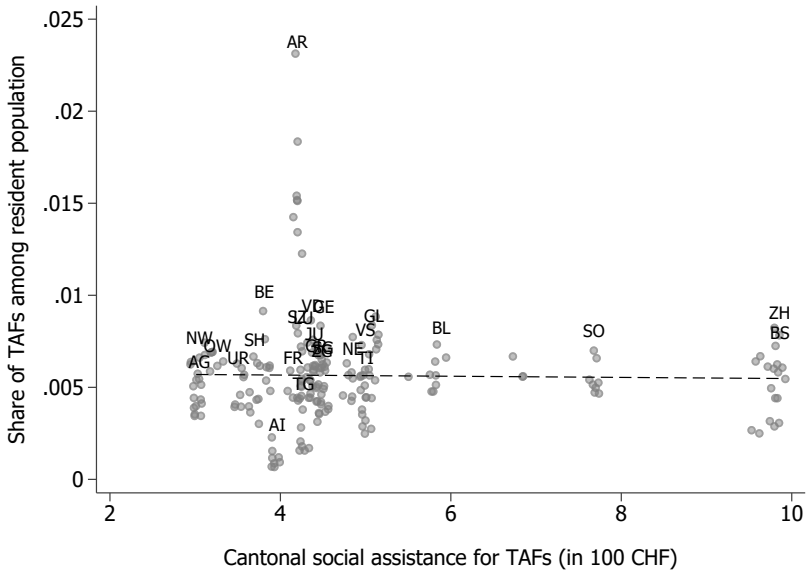
Note: The figure plots coefficients from an OLS regression of the cantonal social assistance rate (in 100 CHF) or the quarterly change in the cantonal social assistance rate from $t-1$ to t against past unemployment rate (in percent) and crime (probability $\times$ 100), respectively. The regressions include canton and quarter fixed effects. We add lags stepwise from $t-1$ to $t-4$ quarters. 95% confidence intervals clustered at the canton level reported.

Figure A.5: Probability of changing residence canton by type of permit



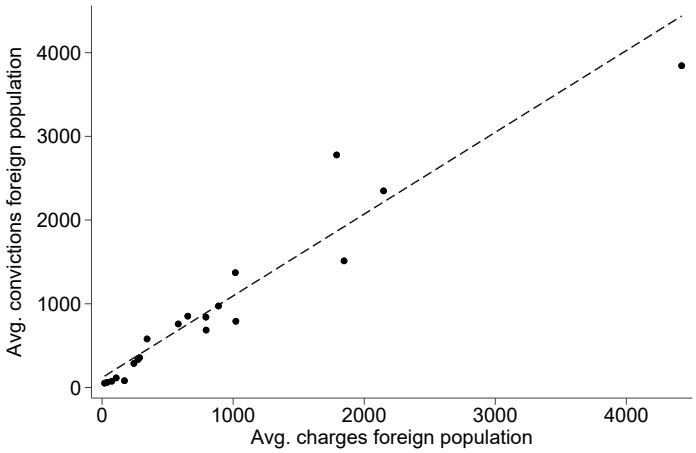
Note: The figure plots the predicted probabilities of refugees ever moving to another canton (registration as of December 31) using an OLS specification in which the probability to move $P_{\text{moved},i,c,r}$ of individual i, who is initially assigned to canton c and holds permit type r, is a function of the permit type (four binary indicators for C, B, F, and N permit). The regression is adjusted for individual fixed and canton fixed effects. The sample is restricted to individuals with at least one and at most 10 years of residence. Note that asylum seekers are typically assigned to another canton than the one in which their initial reception center is located. This explains a slightly higher moving probability of N compared to F permit holders.

Figure A.6: Share of TAFs in cantonal resident population by social assistance rate



Note: The figure plots the yearly share of TAFs against the yearly average reduced social assistance rate. Points indicate canton–year observations (jittered). The linear fit (black dashed line) confirms that any variation in the cantonal share of TAFs is not driven by the reduced social assistance rate. The correlation coefficient is -0.021.

Figure A.7: Criminal charges and convictions across cantons, 2009–2016



Note: The figure depicts the relationship between the number of charges and the number of convictions among the foreign population. The underlying correlation coefficient (black dashed line) is 0.977. The aggregate cantonal data are provided by the Federal Statistical Office (FSO, 2023a).

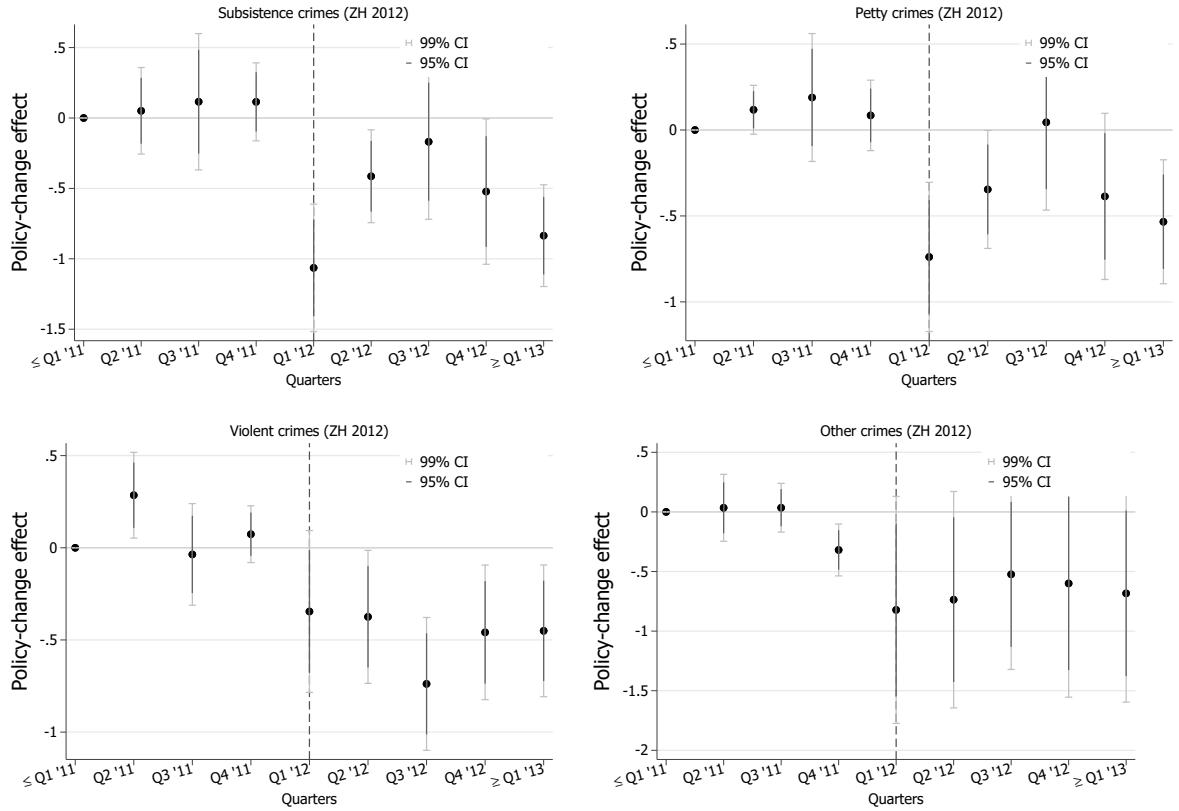
B Additional crime results

Table B.1: ITT effect of social assistance on crimes by gender

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Panel A: Males						
Social assistance	-0.118*	-0.055	-0.105***	-0.133***	0.011	-0.028
	(0.061)	(0.049)	(0.032)	(0.041)	(0.015)	(0.037)
Cluster robust	$p = 0.055$		$p = 0.002$	$p = 0.002$	$p = 0.460$	$p = 0.439$
CWB	$p = 0.070$		$p = 0.122$	$p = 0.094$	$p = 0.543$	$p = 0.571$
Jackknife CV3	$p = 0.270$		$p = 0.054$	$p = 0.071$	$p = 0.596$	$p = 0.670$
			Policy controls			
Welfare cuts	-1.012	-0.920	-0.421	-1.212	-0.453	-0.270
	(1.016)	(1.150)	(1.080)	(1.140)	(0.515)	(0.561)
Integration bonus	-0.007	0.082	0.055	0.014	-0.016	-0.080**
	(0.078)	(0.145)	(0.056)	(0.046)	(0.074)	(0.031)
Income allowance	-0.212***	-0.107	-0.083	-0.031	-0.129	-0.086**
	(0.072)	(0.160)	(0.088)	(0.070)	(0.088)	(0.033)
In-kind benefits	0.976	2.910*	1.437	1.568	0.603	0.149
	(0.924)	(1.532)	(0.909)	(1.072)	(0.632)	(0.325)
Mean DV	1.73	31.88	1.08	0.80	0.55	0.55
Observations	210,005	211,460	210,005	210,005	210,005	210,005
Individual FE	19,776	19,776	19,776	19,776	19,776	19,776
Panel B: Females						
Social assistance	-0.012	-0.152***	-0.019**	-0.024**	-0.008	-0.006
	(0.026)	(0.026)	(0.009)	(0.011)	(0.021)	(0.010)
Cluster robust	$p = 0.645$		$p = 0.031$	$p = 0.026$	$p = 0.702$	$p = 0.510$
CWB	$p = 0.747$		$p = 0.150$	$p = 0.156$	$p = 0.818$	$p = 0.675$
Jackknife CV3	$p = 0.772$		$p = 0.089$	$p = 0.112$	$p = 0.817$	$p = 0.670$
			Policy controls			
Welfare cuts	0.131	-0.549	0.637	-0.178	-0.355	-0.654*
	(0.519)	(1.777)	(0.457)	(0.472)	(0.358)	(0.349)
Integration bonus	0.057	0.255	0.034	0.035	-0.000	0.015
	(0.054)	(0.196)	(0.031)	(0.035)	(0.025)	(0.026)
Income allowance	-0.033	-0.415**	-0.079	-0.061**	0.056**	-0.005
	(0.062)	(0.203)	(0.061)	(0.027)	(0.022)	(0.021)
In-kind benefits	-0.014	0.000	-0.336*	-0.144	0.241*	0.160
	(0.210)	(.)	(0.193)	(0.122)	(0.140)	(0.133)
Mean DV	0.44	9.06	0.30	0.22	0.10	0.11
Observations	152,242	153,060	152,242	152,242	152,242	152,242
Individual FE	14,162	14,162	14,162	14,162	14,162	14,162

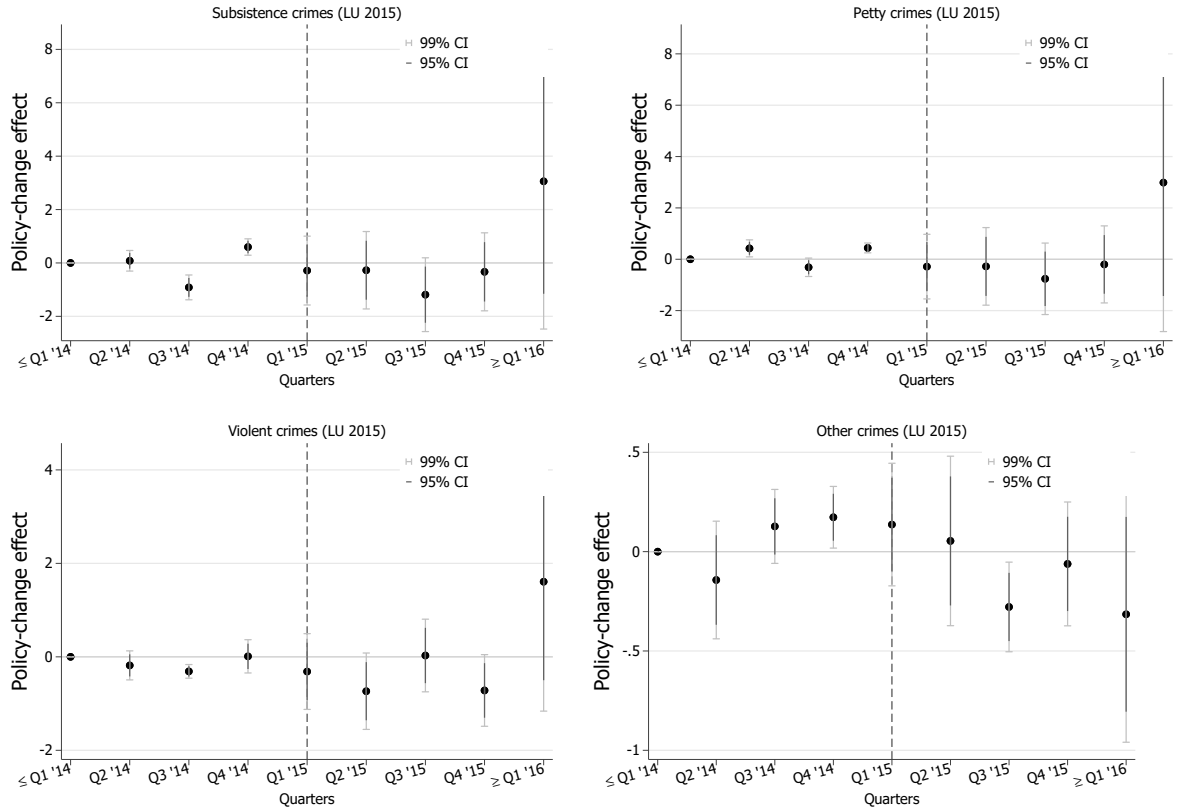
Note: The table shows OLS estimates of cantonal social assistance on crime probability (x100), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample is restricted to F permit holders who have resided in Switzerland no longer than 10 years and who are male (panel A) or female (panel B). SE clustered at canton level (N=26); CWB restricted. Significance stars based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Figure B.1: Event studies exploiting SA changes in Zurich



Note: Increase in welfare benefits in the canton of Zurich from 680 CHF to 984 CHF in Q1 of 2012. The control group comprises all cantons without variation in the social assistance rate in the respective period.

Figure B.2: Event studies exploiting SA changes in Lucerne



Note: Decrease in welfare benefits in the canton of Lucerne from 974 CHF to 427 CHF in Q1 of 2015. The control group comprises all cantons without variation in the social assistance rate in the respective period.

Table B.2: ITT effect of social assistance (as ratio) on crimes

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Social assistance	-0.736***	-0.736**	-0.688***	-0.866***	0.015	-0.224
	(0.236)	(0.341)	(0.154)	(0.190)	(0.092)	(0.183)
Cluster robust	$p = 0.003$		$p = 0.000$	$p = 0.000$	$p = 0.863$	$p = 0.212$
CWB	$p = 0.056$		$p = 0.056$	$p = 0.056$	$p = 0.056$	$p = 0.056$
Jackknife CV3	$p = 0.075$		$p = 0.006$	$p = 0.013$	$p = 0.876$	$p = 0.486$
Welfare cuts	-0.523	-0.845	0.043	-0.769	-0.428	-0.435
	(0.576)	(0.916)	(0.506)	(0.662)	(0.336)	(0.435)
Integration bonus	0.034	0.134	0.050	0.026	-0.000	-0.033**
	(0.038)	(0.082)	(0.029)	(0.028)	(0.034)	(0.016)
Income allowance	-0.144***	-0.168*	-0.079*	-0.040	-0.059	-0.058***
	(0.046)	(0.096)	(0.046)	(0.040)	(0.054)	(0.016)
In-kind benefits	0.419	2.517**	0.646	0.806	0.363	0.080
	(0.457)	(1.158)	(0.413)	(0.525)	(0.350)	(0.207)
Prioritization	-0.017	0.000	0.078	-0.253	-0.082	-0.099
	(0.292)	(.)	(0.337)	(0.362)	(0.183)	(0.154)
Mean DV	1.19	22.30	0.75	0.56	0.36	0.36
Observations	362,247	364,520	362,247	362,247	362,247	362,247
Individual FE	33,934	33,934	33,934	33,934	33,934	33,934

Note: The table shows OLS estimates of cantonal social assistance (reduced rate as share of cantonal standard rate) on crime probability (x100), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample is restricted to F permit holders who have resided in Switzerland no longer than 10 years. SE clustered at canton level (N=26); CWB restricted. Significance stars based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Table B.3: ITT effect of social assistance on criminal charges, logit

	All crimes (1)	Subsistence crimes (2)	*Petty crimes* (3)	Violent crimes (4)	Other crimes (5)
Panel A: Full sample					
Social assistance	-0.063**	-0.076**	-0.108***	0.005	-0.081*
	(0.025)	(0.030)	(0.034)	(0.045)	(0.046)
Mean DV	0.012	0.008	0.006	0.004	0.004
Observations	37,212	26,714	19,431	15,925	15,294
Panel B: Men only					
Social assistance	-0.072***	-0.077**	-0.116***	0.013	-0.090*
	(0.027)	(0.034)	(0.038)	(0.049)	(0.050)
Mean DV	0.017	0.011	0.008	0.005	0.006
Observations	29,172	20,933	15,119	13,514	12,817

Note: The table shows results from panel logistic regressions of cantonal social assistance on crime probability (indicator with 0;1), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample is restricted to TAFs who reside in Switzerland no longer than 10 years. All models adjust for related policies (welfare cuts as % of aid, integration bonuses in CHF, income allowance in CHF, dummy for benefits contributed partly in kind). SE clustered at canton level (N=26). *p<0.10 **p<0.05 ***p<0.01.

Table B.4: SA-on-crime effect, only cantons with variation in the social assistance rate

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Social assistance	-0.070***	-0.079***	-0.071***	-0.087***	0.005	-0.013
	(0.019)	(0.021)	(0.012)	(0.011)	(0.012)	(0.017)
Cluster robust	$p = 0.004$		$p = 0.000$	$p = 0.000$	$p = 0.649$	$p = 0.448$
CWB	$p = 0.062$		$p = 0.092$	$p = 0.124$	$p = 0.617$	$p = 0.421$
Jackknife CV3	$p = 0.040$		$p = 0.000$	$p = 0.000$	$p = 0.726$	$p = 0.666$
Welfare cuts	-1.709*	-1.253	-1.032	-1.806*	-0.693	-0.642
	(0.900)	(1.501)	(0.895)	(0.955)	(0.491)	(0.536)
Integration bonus	0.001	0.144***	0.030	0.003	-0.023	-0.038*
	(0.017)	(0.029)	(0.033)	(0.037)	(0.041)	(0.017)
Income allowance	-0.127***	-0.214***	-0.083*	-0.038	-0.003	-0.063***
	(0.025)	(0.026)	(0.044)	(0.039)	(0.079)	(0.017)
In-kind benefits	0.043	-0.528***	0.269***	0.124	-0.031	-0.096
	(0.111)	(0.064)	(0.081)	(0.069)	(0.069)	(0.078)
Prioritization	-0.160	0.000	-0.323	-0.289	0.038	-0.064
	(0.296)	(.)	(0.223)	(0.180)	(0.108)	(0.138)
Mean DV	1.37	23.86	0.88	0.66	0.40	0.39
Observations	145,208	146,091	145,208	145,208	145,208	145,208
Individual FE	13,633	13,633	13,633	13,633	13,633	13,633

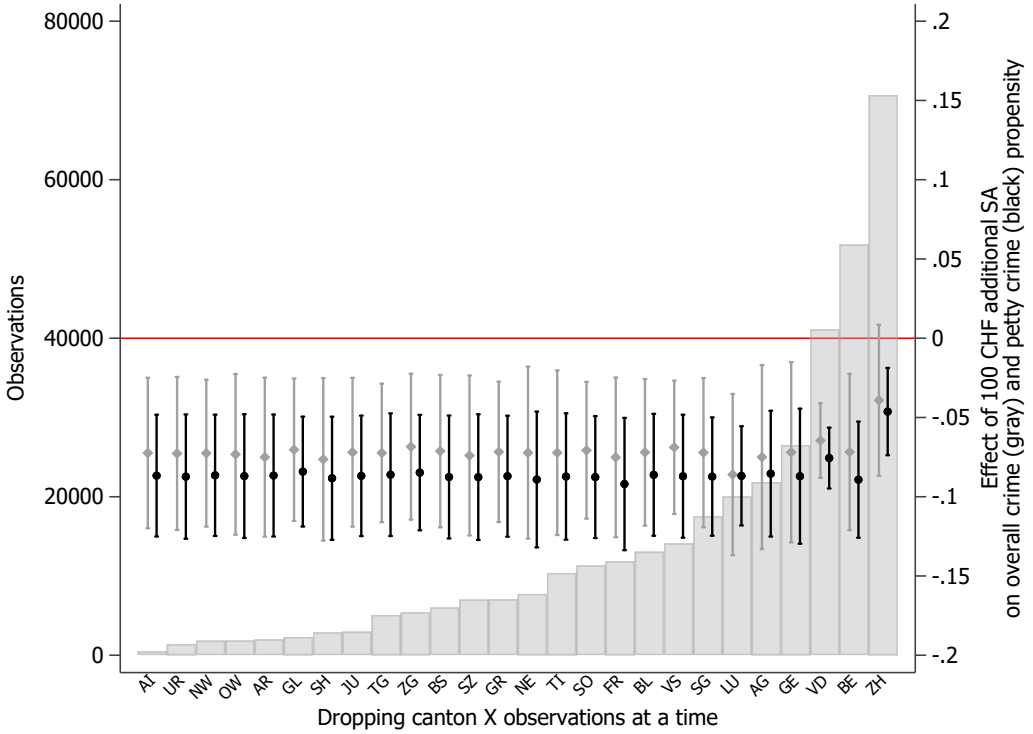
Note: The table shows OLS estimates of cantonal social assistance on crime probability (x100), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample is restricted to TAFs who have resided in Switzerland no longer than 10 years in cantons that have had one or more welfare policy changes during the observation period. SE clustered at canton level (N=26); CWB restricted. Significance stars based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Table B.5: ITT effect of social assistance on crimes (B/C permits)

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Social assistance	-0.177	0.468	-0.171*	-0.132	-0.028	-0.038
	(0.113)	(0.549)	(0.091)	(0.109)	(0.062)	(0.089)
Cluster robust	$p = 0.131$		$p = 0.072$	$p = 0.238$	$p = 0.657$	$p = 0.670$
CWB	$p = 0.413$		$p = 0.413$	$p = 0.413$	$p = 0.413$	$p = 0.413$
Jackknife CV3	$p = 0.578$		$p = 0.341$	$p = 0.723$	$p = 0.856$	$p = 0.882$
Welfare cuts	-0.152	-0.798	-0.117	-0.227	0.267	-0.234
	(0.403)	(1.334)	(0.297)	(0.253)	(0.376)	(0.293)
Integration bonus	0.103***	0.229***	0.038**	0.031***	0.041***	0.054***
	(0.012)	(0.047)	(0.015)	(0.011)	(0.014)	(0.007)
Income allowance	-0.072	-0.176	-0.043	-0.003	0.006	-0.047
	(0.042)	(0.116)	(0.041)	(0.028)	(0.011)	(0.033)
Mean DV	0.82	13.44	0.45	0.30	0.31	0.25
Observations	426,467	427,682	426,467	426,467	426,467	426,467
Individual FE	32,169	32,169	32,169	32,169	32,169	32,169

Note: The table shows OLS estimates of cantonal social assistance on crime probability (x100), adjusted for individual, year–quarter (N=32), and residence duration (years, N=11) fixed effects and for accompanying cantonal welfare policies. The sample is restricted to B/C permit holders who have resided in Switzerland no longer than 10 years. All models adjust for related policies (welfare cuts as % of aid, integration bonuses in 100 CHF, income allowance in 100 CHF), while standard welfare rates do not vary in in-kind payments. SE clustered at canton level (N=26); CWB restricted. Significance stars based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

Figure B.3: ITT effect on total crimes, excluding one canton at a time



Note: The figure shows the ITT effects of 100 CHF higher social benefits on the overall crime probability (×100, gray marker) and probability of petty crimes (×100, black marker) when dropping one canton at a time. Main specification with SE clustered at cantonal level. 95% CI indicated.

Table B.6: Aggregate canton-level association between the social assistance rate and crime p.c.

	Total effect		Crime categories			
	All crimes (1)	Prison sentence (2)	Subsistence crimes (3)	*Petty crimes* (4)	Violent crimes (5)	Other crimes (6)
Panel A: Aggregate level, crimes/prison sentence (days) per capita						
SA	-0.026	-2.118*	-0.029*	-0.032***	-0.001	0.003
	(0.057)	(1.077)	(0.017)	(0.005)	(0.038)	(0.011)
Mean DV	1.908	20.355	0.801	0.481	0.657	0.422
R2	0.213	0.260	0.314	0.393	0.131	0.137
Observations	832	832	832	832	832	832
Panel B: Aggregate level, log crimes/prison sentence						
SA	-0.014	-0.061	-0.039*	-0.058***	-0.018	-0.005
	(0.017)	(0.048)	(0.019)	(0.019)	(0.033)	(0.016)
Mean DV	2.125	7.775	1.428	1.088	1.183	0.914
R2	0.861	0.703	0.844	0.855	0.760	0.779
Observations	832	832	832	832	832	832

Note: OLS effect of cantonal social assistance on aggregated crime probability (per capita and as log), adjusted for year–quarter (N=32) and residence canton (N=26) fixed effects. Estimations based on the universe of registered crimes by TAFs (crime registry data only). SE clustered at canton level (N=26). *p<0.10 **p<0.05 ***p<0.01.

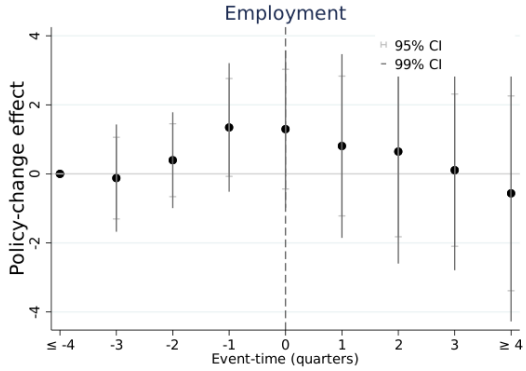
C Additional labor market results

Table C.1: The labor market effects of social assistance

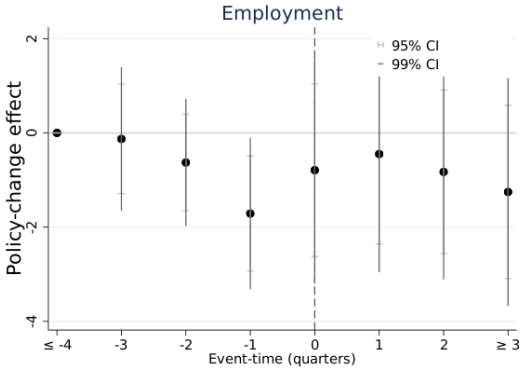
	Employed (×100) (1)	Earnings (CHF) (2)	Disposable (CHF) (3)	Employed (×100) (4)	Earnings (CHF) (5)	Disposable (CHF) (6)
SA	-0.411	-0.054	0.010	-0.033	0.001	0.032
	(0.475)	(0.042)	(0.024)	(0.156)	(0.005)	(0.022)
Cluster-robust	0.387	0.200	0.671	0.833	0.913	0.142
CWB	0.503			0.839		
Jackknife CV3	0.908			0.908		
Mean DV	21.193	1481.321	1925.940	21.193	3928.459	1926.270
Observations	303,484	303,484	303,484	303,484	114,436	303,432
Canton FE	26	26	26			
Individual FE				26,963	8,757	26,950
Policy controls	yes	yes	yes	yes	yes	yes
Estimator	OLS	Poisson	Poisson	OLS	Poisson	Poisson

Note: The table shows the effect of social assistance on employment (in columns 1 and 4), total earnings in CHF (columns 2 and 5) and disposable income in CHF (columns 3 and 6). All models include year–quarter and residence duration fixed effects. Columns 1-3 include canton fixed effects, while Columns 4-5 use individual fixed effects. We control for maximum welfare cuts (in percent of social assistance), integration supplement (in CHF), tax-free allowance, and an indicator that is set to one if part of the support can be paid in kind. Standard errors are clustered at the canton level (N=26). We also report *p*-values from the cluster wild bootstrap (CWB) and cluster jackknife. Significance stars based on cluster-robust SE: *p<0.10 **p<0.05 ***p<0.01.

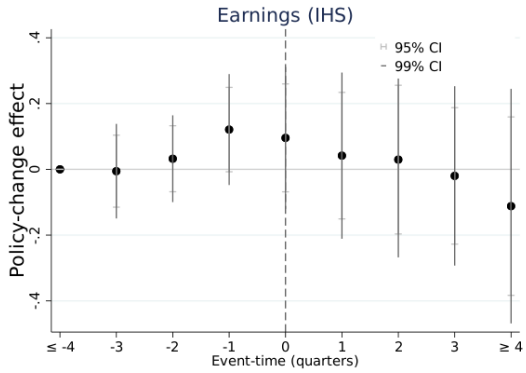
Figure C.1: Event studies estimating the effect on labor market outcomes



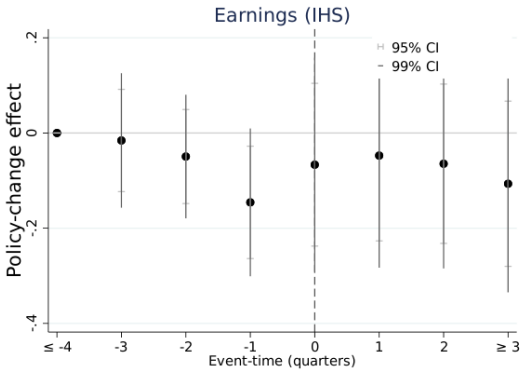
(a) Event study: Zurich vs. control



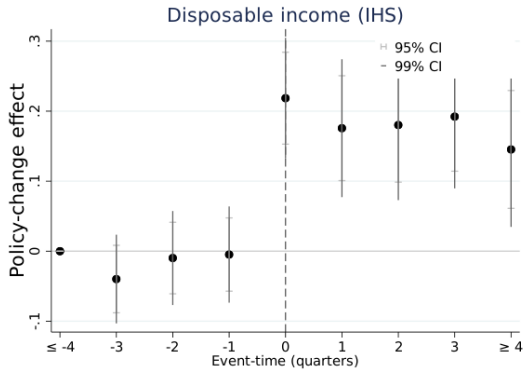
(b) Event study: Lucerne vs. control



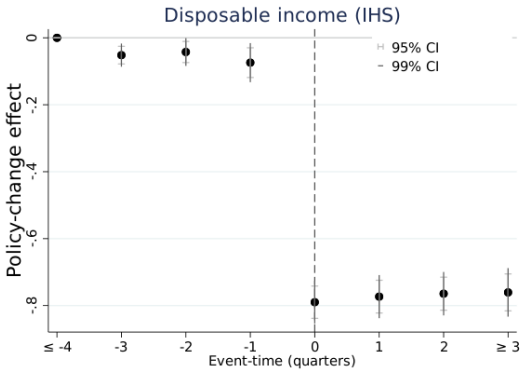
(c) Event study: Zurich vs. control



(d) Event study: Lucerne vs. control



(e) Event study: Zurich vs. control



(f) Event study: Lucerne vs. control

Note: Figure C.1a – Increase in welfare benefits in the canton of Zurich from 680 CHF to 984 CHF in Q1 of 2012. Figure C.1b – Reduction of welfare benefits in the canton of Lucerne from 974 CHF to 427 CHF in Q1 of 2015. The control group comprises all cantons without variation in the social assistance rates.