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REFUGEE MIGRATION AND BUSINESS REGISTRATIONS

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Abstract

This paper examines the effect of refugee migration on local business registrations. We exploit the large sudden intake of asylum seekers in 2015/16 which varies significantly across the about 400 German districts (*Kreise*). To address potential endogeneity in the allocation of asylum seekers, we instrument asylum seekers with within-state allocation quotas. We combine unique data on business registrations at the district level with data on asylum seeker arrival in Germany between 2007 and 2021. Our findings indicate that a higher number of asylum seekers per capita in a district leads to more business registrations per capita. An increase of 100 asylum seekers p.c. increase business registrations p.c. by 7. This creates 27 new job positions p.c. The new businesses are mainly registered by men and Germans. We observe the increase in the manufacturing and service to end-consumer sector. Asylum seekers do not lead to business deregistrations.

Keywords: Migration, Refugees, Labor Markets, Business Registrations, Entrepreneurship **JEL codes**: F22, J15, L26, M13, R23

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1 Introduction

Since late 2015, the number of arriving asylum seekers has increased sharply in Germany and other parts of Western Europe. Fleeing from war and humanitarian crises, people coming for example from Syria, Afghanistan, or Iran were seeking shelter in Europe. Over half of the asylum seekers have since then been granted refugees status (BAMF, 2022).¹ This development has had a noticeable impact on German society and its economy. It continues to be salient as the numbers of asylum seekers arriving in Germany has increased again in the aftermath of the Russian invasion of Ukraine in 2022 (BAMF, 2023a).

New registrations for small-and-medium sized businesses are an important engine for economic growth and employment (Parker, 2018). However, in Germany, the self-employment rate is traditionally relatively low on average in the EU and has been falling since the early 2000s (OECD, 2023). For example, the self-employment rate in Spain, Poland, or Italy over the years 2000 until 2021 were on average 17.4%, 23.2%, and 25.2%, compared to 11% in Germany (World Bank, 2023). Can refugee migration contribute to improving this share in Germany or does it rather discourage individuals from setting up new businesses in Germany?

Refugee migration affects the economy and labor markets in several ways. First, after a while refugees may take up regular employment and participate in the German labor market. The IAB-BAMF-SOEP survey of refugees indicates that 49% of the refugees who came to Germany from 2013 to the end of 2016 were in regular employment after five years (Brücker *et al.*, 2020).² Second, the intake of asylum seekers can lead to the creation of new jobs for example through certain demand patterns. Berbée *et al.* (2023) show that asylum seekers have a demand for housing, food, public services, and other subsistence goods. This creates a labor demand effect in the non-tradeable sector. They find a significant effect in the public administration and

¹Individuals fleeing from war and applying for asylum are called asylum seekers. When they receive asylum in a country, they are called refugees. We focus on all individuals who are seeking shelter in Germany (*Schutz-suchende insgesamt*) and call them asylum seekers.

²Asylum seekers can affect native workers either by replacing native workers or through wages. Gehrsitz and Ungerer (2022) estimate that refugees have not displaced native workers in Germany after 2015/16.

finance, insurance, and real estate sector. Third, asylum seekers may seek self-employment and start their own businesses (Kone *et al.*, 2020). Based on the microcensus, Leicht *et al.* (2021) estimate that refugees had a self-employment rate³ of 8.1% in 2019.

An additional workforce, new or different demand for goods and services, and the willingness of asylum seekers to be self-employed can increase business registrations in Germany. On the other hand, a large share of refugees in a certain region may harm local economic growth (Batut and Schneider-Strawczynski, 2021) and thus, discourage individuals from setting up a new business.

We study the effect of asylum seekers on business registrations by exploiting the large intake of asylum seekers in 2015/16. Our analysis is based on annual data for 393 German districts (*Kreise*) between 2007 and 2021.⁴ In Germany, asylum seekers were allocated to districts according to administrative quotas. However, these quotas were not always fulfilled. Due to limited housing capacities or for ideological reasons, some districts accommodated more/less asylum seekers than they were obliged to. Therefore, the allocation was not completely exogenous. To overcome the endogeneity of asylum seeker allocation, we use an instrumental variable approach. We use the within-state allocation quotas to instrument the number of asylum seekers in a district. These quotas are typically based on the population share in each district and are uncorrelated with economic characteristics of the districts.

We use unique data on the universe of business registrations between 2007 and 2021. In Germany, new businesses need to be registered at the local trade office (*Gewerbeamt*). We obtain the number of business registrations in total and by industry as well as gender and nationality of the business owner. We combine this with data on asylum seekers in Germany. Data on the number of asylum seekers is provided by the Central Register of Foreigners (*Ausländerzentralregister*) where every asylum seeker is registered. Therefore, we have full coverage

³The self-employment rate shows the proportion of self-employed individuals among all employed persons in certain groups, here among refugee.

⁴We thereby cover the universe of German regions. The reason that we have 393 instead of the 401 official districts is that some districts have jointly organized refugee allocation matters.

of business registrations and asylum seekers at the district level. Moreover, we have obtained the within-state allocation quotas from the federal government agencies in charge by contacting them individually via email.

We find that an increase of 100 asylum seekers per capita increases business registrations per capita by seven. At the mean number of business registrations per 100 inhabitants of 1 and asylum seekers per 100 inhabitants, this corresponds to an increase of 7%. Extensive robustness tests support this positive relationship between asylum seekers p.c. and business registrations p.c. The businesses are mainly registered in the manufacturing sector and sectors that offer end-consumer services like trade, finance, and guard and security services. Most businesses are registered by men and have at least one German founder. However, there is also an increase in business registrations where at least one founder comes from the top 10 asylum countries.⁵ Additionally, an increase of 100 asylum seekers per capita increase the number of employees of newly registered businesses per capita by 27. The majority of the positions are full-time. Conversely, asylum seekers per capita have no effect on business deregistrations per capita, i.e. there is no indication that businesses are closed down because of the arrival of refugees.

This paper primarily contributes to the literature on the effect of migrants on the economy of host countries. We focus on the impact of asylum seekers on business registrations in the host country. Our paper especially relates to the strand of literature that focuses on the effect of migrants on the labor market. Dustmann *et al.* (2016) find very small and insignificant effects of immigration from Czech Republic to Germany on natives' wages. Foged and Peri (2016) show that in Denmark migration has a positive effect on native unskilled wages and employment. Considering refugee migration, Gehrsitz and Ungerer (2022) estimate the effect of refugees who came to Germany in 2014/15 on native workers finding that refugees have not displaced native workers. We extend the analysis on the effect of refugee migration on the host-country labor market by focusing on business registrations. Additionally, we extend

⁵According to the data of the Central Register of Foreigners, the top 10 asylum countries in Germany between 2007 and 2021 are Syria, Afghanistan, Iraq, Eritrea, Iran, Somalia, Türkiye, Russia, Pakistan, and Nigeria.

the the literature by showing that asylum seekers increase the number of workplaces by rising business registrations.

We also contribute to the literature that examines how local economic activity is affected by asylum seekers. Berbée *et al.* (2023) estimate that with increasing asylum seekers the demand for locally produced goods increase and therefore, the local employment increases.⁶ Batut and Schneider-Strawczynski (2021) show that in France the opening of housing centers for refugees decrease the economic activity of the hosting municipality. This effect is related to a decrease in population because fewer people move to these municipalities due to prejudices against asylum seekers. We add to the literature on local economic activity by showing that economic activity increase in form of business registrations in districts with a higher share of asylum seekers.

In addition, we contribute to the literature on refugees and entrepreneurship focusing on the group of people with a migration background who start a business. Existing literature focuses on opportunities for refugees to become entrepreneurs themselves.⁷ The focus is on case studies describing the situation of refugees as entrepreneurs (Heilbrunn *et al.*, 2019). Empirical evidence is scarce. For example, Kone *et al.* (2020) analyses the likelihood of self-employment of different migrant groups in the United Kingdom and finds that asylum seekers have a six percentage points higher likelihood to be engaged in self-employment than UK citizens. Conversley, Brunetti and Zaiceva (2023) show that in Italy, non-economic migrants have a lower likelihood to become self-employed than natives. This literature does not focus on the effect of asylum seekers on business registrations in total in the host country so far. We contribute with an analysis focusing on business registrations in total. This applies not only to refugees, but also to natives and anyone else who is allowed to set up a business in Germany.

Finally, the effect of asylum seekers on business registrations in total is usually neglected in the existing literature. Altındağ *et al.* (2020) estimate the effect of refugees on the number of

⁶They instrument the number of asylum seekers with within-state allocation quotas and additionally, use as a second instrument empty military barracks.

⁷For an overview of the literature of refugee entrepreneurship see Desai *et al.* (2020) or Abebe (2022).

new firms in Türkiye over the period from 2011 to 2016. Their findings show a robust increase in the number of new firms in refugee-hosting areas. To ensure an exogenous variation in the number of refugees, they use the historical background of Arabic speaking people as an instrument for the number of asylum seekers in Türkiye. Their results are supported by other analyses for Türkiye such as Akgündüz *et al.* (2018) and Cengiz and Tekgüç (2021).

It is not clear whether asylum seekers can have the same effect on business registrations in an industrialized country. To the best of our knowledge, there is no such analysis in countries of the European Union or another industrialized country. We estimate the effect of asylum seekers on business registrations in a developed country focusing on Germany. Our preliminary findings suggest a positive and robust effect of refugee migration on business registrations. One additional contribution of our paper is that we are able to observe several years after the treatment. The decision and implementation of a start-up takes time. Therefore, with a longer research period we can estimate the effect of asylum seekers on business registrations not only in the short run but also in the medium run.

Our results have important implications for the evaluation of refugee migration in economic terms. Existing literature focuses on fiscal effects via tax-transfer systems and focuses on immediate effects on regular employment. This literature provides somewhat mixed but increasingly positive effects of refugee migration on fiscal balances (Colas and Sachs, 2024; Dustmann and Frattini, 2014). Our paper provides an additional positive effect which may take even more time to materialize in fiscal balances. The fact that refugee migration leads to a surge in new business registration should be therefore taken into account into these kind of fiscal analysis, at least in medium- to long-run projections.

2 Background

2.1 Asylum seeker allocation in Germany

The allocation of asylum seekers in Germany to districts is done in two steps. First, they are allocated to the federal states. When asylum seekers arrive Germany, they are registered in

the nearest initial reception facility (*Erstaufnahmeeinrichtung*). From there, the refugees are distributed to the 16 federal states.⁸ The allocation of asylum seekers is based on fixed quotas following a rule called *Königsteiner Schlüssel*.⁹

Second, they are allocated to the districts within the federal state. When arriving in the allocated federal state, asylum seekers live in an initial reception center of the assigned federal state before being allocated to districts. Each state uses different allocation rules. However, most states set quotas based on the population share of the districts. Typically, the within-state allocation quotas are independent of economic characteristics of districts.¹⁰ It is mandatory for all federal states, districts, and asylum seekers to participate in the allocation process. In theory, this ensures an exogenous allocation of asylum seekers. However, data show that there is imperfect compliance with quotas (see Figure 1). Due to a lack of appropriate housing or political convictions, asylum seekers are not always distributed according to quotas. Therefore, allocation is not completely exogenous.

[Figure 1 goes here]

Asylum seekers cannot freely choose to live in another federal state. They need to stay in the state that they were assigned to for three years. This regulation ensures the allocation effect of the *Königsteiner Schlüssel* and prevents asylum seekers to move to another federal state. This avoids a shift in responsibilities between the federal states. With this residence rule, federal states can assign refugees to a place of residence (positive allocation) or prohibit the move to certain areas (negative allocation).

⁸Some regional Federal Offices for Migration and Refugees have specialized on specific nationalities and receive over proportionally many refugees from these countries. Although this might cluster refugees in some states, there is no allocation of a single nationality to one specific state.

⁹The *Königsteiner Schlüssel* calculates the quotas based on tax revenues (two-thirds) and population (onethird) of the states (BAMF, 2023b). However, Schmandt *et al.* (2023) show that the key corresponds mainly to population shares of the states because tax revenue is used in the calculation only after the redistribution of funds between the states. Thus, the actual economic power of a federal state has no relevance for the *Königsteiner Schlüssel*. This leads to an exogenous allocation of refugees to the states, independent of economic conditions.

¹⁰For a detailed description of the different allocation quotas see Online Appendix A.4.

Seven federal states (Baden Wurttemberg, Bavaria, Hesse, North Rhine-Westphalia, Saarland, Saxony, and Saxony-Anhalt) apply strict positive allocation to their districts since 2016/17. Asylum seekers allocated to the three cities states (Berlin, Bremen, and Hamburg) are not allowed to live outside the cities. In the remaining six federal states, refugees are allowed to move to another district within federal states. However, Aksoy *et al.* (2023) show that most refugees stay in their initial place of residence, regardless of whether the federal states strictly apply the positive allocation. This indicates that the *Königsteiner Schlüssel* and within-state allocation quotas determine where asylum seekers live in several years after their arrival in Germany.

2.2 Entrepreneurship

Registering a business means that the person in charge becomes self-employed. Governments support self-employment in the hope of boosting the country's economy (BMWK, 2023). New businesses are connected with innovation and new job opportunities which should sustain economic growth now and in the future. Individuals can choose if they want to start their own business. Individuals choose self-employment if:

$$EU(\pi) > U(w) \tag{1}$$

If the utility of entrepreneurship $(EU(\pi))$ is higher as the utility of the alternative (U(w)) individuals will choose to be self-employed (von Greiff, 2009; Parker, 2018). The opportunity costs are the wage that can be earned when employed or the unemployment benefits. If the alternative utility decreases the utility of self-employment increases.

There are push and pull factors for self-employment. Push factors lower opportunity costs. Pull factors can increase the utility of being self-employed. The decision depends on the risk aversion of the individual. Starting a new business relates to uncertainty and having a higher level of risk-taking behavior helps individuals to start their own business. Caliendo *et al.* (2007) show that in general, individuals with higher risk-taking behavior is more likely to become selfemployed if individuals coming out of regular employment. Conversely, if individuals come out of unemployment risk-aversion is not a decisive factor. Additionally, push and pull factors can depend on the national business cycle. However, the effect of the national business cycle is not clear. Evidence on how economic performance affects business registrations is mixed (Blanchflower, 2000; Koellinger and Thurik, 2012; Svaleryd, 2014).

Individuals can be pushed into self-employment to prevent unemployment considering that the utility of self-employment is higher than the unemployment benefit (von Greiff, 2009). The risk to be unemployed is especially high during a recession. Therefore, push factors of self-employment can be decisive during a recession (Fossen, 2020). However, a recession can also deter individuals from starting a business. If there is a low likelihood that the business will be successful individuals with high risk-aversion might avoid self-employment. The opportunity costs will increase. A second push factor for self-employment can be difficulties on the labor market. If a person is discriminated against on the labor market or is unable to participate in the labor market, e.g. due to illness or caring for a relative, self-employment can be an alternative to unemployment. Especially, immigrants might be pushed into self-employed due to discrimination (Constant and Zimmermann, 2004).

Individuals can also be pulled into self-employment to improve their living. One pull factor might be that the alternative like employee salary is lower than the revenues of being self-employed. Additionally, self-employment can bring additional attributes like flexible working hours, freedom, and self-realization (Blanchflower, 2000; Svaleryd, 2014). The likelihood that the new business will be a success is especially high during an expansion phase. Therefore, it is likely that businesses are formed during a boom (Fossen, 2020). However, individuals may decide against self-employment during a booming period because it is easy to find a job and opportunity costs increase (Svaleryd, 2014).

Asylum seekers can influence these push and pull factors. First, asylum seekers increase the demand for non-tradeable goods (Berbée *et al.*, 2023) and are a new workforce (Cengiz and Tekgüç, 2021). This can offer a new opportunity and act like a pull factor for individuals to start their own business. Second, asylum seekers might decrease local economic activity (Batut and Schneider-Strawczynski, 2021) and lead to unemployment which might push people into self-

employment. Third, if asylum seekers receive asylum and are refugees, they might start their own business.¹¹ Refugees might face problems to enter the labor market of the host country. Then they might be pushed into self-employment to avoid unemployment. It is assumed that refugees have a higher level of risk-taking behavior and therefore, more likely to decide for self-employment (Leicht *et al.*, 2021). Either way, asylum seekers can affect business registrations.

3 Data

3.1 Asylum seeker data

Data on asylum seekers across German districts and over time is obtained from the Federal Statistical Office. The dataset includes all individuals searching for protection (*Schutzsuchende*), which we define as *aslyum seekers*. Asylum seekers are foreigners who are staying in Germany for reasons of international law, on humanitarian, or political grounds and who are registered at the Central Register of Foreigners¹² (*Ausländerzentralregister*) with the corresponding status under residence law.¹³

Once individuals are granted asylum (*befristet anerkannter Schutzstatus aus Asylverfahren*), they are called *refugees*. Figure 2 illustrates the number of asylum seekers in Germany over time which has increased in recent years. From 2007 to 2021 the number of asylum seekers increased from 460,000 to 1,940,000. The sharpest increase was in 2015 and 2016.

¹¹More information about refugee entrepreneurship can be found in Section A.5 in the Online Appendix.

¹²Due to the large number of refugees arriving in Germany in 2015/2016, some asylum seekers were already distributed to the states before the data was collected upon entry to Germany. However, the data was adjusted in the states afterwards (BAMF, 2023b).

¹³The asylum seekers are then split up in people with an open protection status (*offener Schutzstatus*), acknowledged protection status (*anerkannter Schutzstatus*), or rejected protection status (*abgelehnter Schutzstatus*). If people have an acknowledged protection status, this status is either valid for an unlimited period of time (*Niederlassungserlaubnis*) or the status is valid for a limited time. The latter also includes the temporary protection by asylum (*befristet anerkannter Schutzstatus aus Asylverfahren*).

[Figure 2 goes here]

3.2 Data on business registrations

We obtain exclusive access to data on business registrations for the years 2007-2021 from the *Forschungsdatenzentrum* (FDZ) of the German Federal Statistical Office (*Statistisches Bundesamt*). Since 1996, a nationally homogenized data collection of business registrations has been carried out on a monthly basis.¹⁴ The data includes business registrations and deregistrations of all legal entities and natural persons who are legally obliged to register their business at the trade registration office (*Gewerbeant*) of their municipality. The dataset provides information on the industrial sector¹⁵, the number of employees, the official municipality ID as well as the legal form of the business. In addition, the dataset includes information on the nationality and the gender of the founders (Destatis, 2020).¹⁶

For our analysis, we focus on business registrations per capita in total and for selected nationalities. For sole proprietorship it is possible to identify the nationality of the people registering their business unambiguously. This is more difficult for business start-ups of other legal forms because there are more than one founder who can have more than one nationality. In this case, we include businesses in our analysis if at least one founder has a certain nationality. For example, business registrations by Germans have at least one founder who is German. For the evaluation, the nationality at the time of the business registration was decisive.

We examine business registrations who have at least one founder from the top 10 asylum countries: Syria, Afghanistan, Iraq, Eritrea, Iran, Somalia, Türkiye, Russia, Pakistan, and

¹⁴More information can be found in the Online Appendix Section A.3.

¹⁵The economic branches are defined according to the classification of the economic branches edition 2008 (WZ 2008). When registering the trade, the economic activity must be specified in the questionnaire. The economic activity is then classified according to the WZ classifications. A detailed description can be found in the Online Appendix Section A.6.

¹⁶Due to privacy protection, the dataset divided into the mentioned characteristics is only available via the FDZ. Access is subject to a fee. Numbers of business notifications below three and above zero per district, as well as other values that allow conclusions to individuals are censored by the FDZ.

Nigeria. In Germany, individuals who are granted asylum are allowed to be self-employed (see Online Appendix A.5).

The number of total business registrations and business registrations from people originating from top 10 asylum countries from 2007 until 2021 is shown in Figure 3. Total business registrations per capita decrease over time while the business registrations from top 10 asylum countries per number of migrants originating from the top 10 asylum countries increase after 2016. The registrations are aggregated by year and divided by the number of business registrations of the base year 2007. The development of total business registrations in Germany is negative after 2009, following the financial crisis in 2008/09. Conversely, business registrations from people originating from top 10 asylum countries increase after 2015.

[Figure 3 goes here]

3.3 District-level data

Our analysis is based on annual data of 393 German districts between 2007 and 2021.¹⁷ We obtain gross domestic product, population density, and the business tax multiplier. Additionally, we obtain the number of migrants already living in a district.¹⁸

[Table 1 goes here]

¹⁷As of 2023, there are 401 districts. Some districts share a common immigration authority. Therefore, we merge these districts. This is the case for the entire state of Saarland, the city and district Kassel, the city Cottbus and the Spree-Neiße Kreis, and the districts Göttingen and Osterrode im Harz. In addition, district mergers from 2007 to 2023 were taken into account and districts were harmonized accordingly in our dataset.

¹⁸The number of migrants include all people living in Germany with foreign nationality. The numbers are based on the Foreigners' registrations office (*Ausländerbehörde*).

Table 1 shows summary statistics for all variables.¹⁹ We find that all districts have business registrations over the years. On average, there are 0.009 business registrations per capita in one district with a maximum of 0.04. In total, there are 5,895 observations. The majority of the businesses are registered by men on average. The mean of business registrations by men p.c. is 0.007 whereas of women is 0.003. Most business registrations have on average at least one founder with the German nationality (mean of 0.007). There are also some business registrations which have at least one founder coming from top 10 asylum countries. The mean of business registrations per capita with founders originating from top 10 asylum countries is 0.0003. Districts have on average 0.0084 new employees p.c. of newly registered businesses. The majority have full-time positions. Most business registrations are in the trade, traffic, and catering sector per capita with a mean of 0.0029. There are on average 0.012 asylum seekers per capita in each district with a maximum of 0.13. The average number of asylum seekers according to within-state allocation quotas is equally to the actual number of asylum seekers per capita (0.012). However, in the case of asylum seekers per capita according to within-state allocation quotas, there are some districts without any quotas. These districts often have an initial reception facility (IRF). When a district has an IRF, it does not need to accommodate asylum seekers beside the ones living in the IRF.

4 Empirical Model

4.1 Structural relationship

To estimate the relationship between asylum seekers and business registration we use the following model:

¹⁹There is only data available from 2007 to 2020 for the variable population density. For the variables business registrations of men, women and according to business sectors, there is only data available for the years 2008 to 2021. For the business tax multiplier, there is no data available for the two districts Brandenburg an der Havel and Potsdam in the year 2008.

$$y_{i,t} = \alpha + \beta A S_{i,t} + X_{i,t-1} + \lambda_i + \gamma_t + \varepsilon_{i,t}$$
⁽²⁾

 $y_{i,t}$ is the number of business registrations per capita in district *i* and year *t*. $AS_{i,t}$ is the number of asylum seekers per capita in district *i* and year *t*. $X_{i,t-1}$ is a vector of lagged district-level controls that include gross domestic product per capita, population density, the business tax multiplier, and the number of migrants per capita. To account for time-invariant district characteristics and year-specific effects, we include district fixed effects λ_i and year fixed effects γ_t . Standard errors are clustered at the municipality level.

4.2 IV design

4.2.1 Endogeneity concerns

As mentioned in Section 2.1, the allocation of asylum seekers is likely endogenous. Unobserved district characteristics affect both the number of asylum seekers in each district and the number of business registrations. The allocation of asylum seekers to districts was often based on free accommodation capacities or political decisions. Therefore, the allocation was not exogenous, especially during the peak of asylum seeker intake in 2015/16. To prevent homelessness, asylum seekers were sent where there was appropriate housing. Additionally, some regional governments refused to accommodate all the asylum seekers according to the quotas whereas other regional governments agreed to accommodate more asylum seekers than required. Moreover, although adjusted afterwards, the dataset of actual asylum seekers might suffer from measurement error due to registration failures during the peak of 2015/16.

4.2.2 Instrument and first stage

To address potential endogeneity regarding the allocation of asylum seekers, we use an IV approach in the spirit of Berbée *et al.* (2023).²⁰ The instrument is based on the within-state

²⁰Berbée *et al.* (2023) estimate the effect of asylum seekers on local employment. The analysis is based on bi-annual data over the period 2014-2017. For their IV estimation they use two instruments, presence of military

allocation quotas of each federal state. With these quotas, federal states distribute asylum seekers from initial reception facilities to their districts. The instrument is calculated as follows:

$$ASQuota_{i,t} = \frac{ASBundesland_{s,t} \times Quota_{i,t}}{100}$$
(3)

We multiply the number of asylum seekers allocated to the federal state with the official within-state allocation quotas that was effective in year *t*. *ASBundesland*_{*s*,*t*} is the number of asylum seekers allocated to the federal state *s* in year *t*. *Quota*_{*i*,*t*} refers to the official within-state allocation quotas that each federal state defines to allocate asylum seekers to the districts.

This gives rise to the following first stage:

$$AS_{i,t} = \alpha + \beta ASQuota_{i,t} + X_{i,t-1} + \lambda_i + \gamma_t + \varepsilon_{i,t}$$
(4)

We instrument the actual number of asylum seekers per capita $AS_{i,t}$ by the number of asylum seekers a district would have received due to $ASQuota_{i,t}$. Figure A.2 in the Online Appendix shows a binscatter of actual asylum seekers p.c. and the instrument. There is a positive relationship. Thus, asylum seekers p.c. according to within-state allocation quotas represent the actual number of asylum seekers p.c. quite well. However, there is still some variation.

4.2.3 IV sample

Our IV design relies on the availability of within-state allocation quotas. We contacted all responsible government agencies in the federal states and asked for their quotas. We received an answer from seven out of twelve federal states, i.e. Baden-Württemberg, Bavaria, Brandenburg,

barracks and the within-state allocation quotas. With the military barracks Berbée *et al.* (2023) focus on recently arrived asylum seekers. We did not include the barracks because asylum seekers will not or only minimal have an effect in the short run. Forming a business takes time and it takes a while until a business is registered. The newly arrived asylum seekers will not have the same impact on business registrations as asylum seekers who have settled in a district.

Hesse, North Rhine-Westphalia, Saxony, and Rhineland-Palatinate. For these states, we use the quotas that were provided to us. For the other federal states, we obtain the quotas either from official documents or calculate them based on the respective regulation in federal state law.

A more detailed explanation of the allocation of asylum seekers can be found in the Online Appendix A.4. For the federal states Saarland, Berlin, and Hamburg we use the number of asylum seekers assigned by the *Königsteiner Schlüssel*. For Bremen, we use the allocation quotas according to their Admission Act (*Aufnahmegesetz*) which states that 80% of asylum seekers are allocated to Bremen and 20% to Bremerhaven. Some federal states have constant quotas during the sample period, others have yearly changing quotas which we take into account.

4.2.4 Instrument validity

The instrument must affect the outcome only through asylum seekers. Thus, the instrument must be unrelated to the error term of the second stage. This condition is satisfied if the number of asylum seekers according to within-state allocation quotas is uncorrelated with economic characteristics and business formation behavior.

The allocation of asylum seekers according to quotas is an administrative decision of federal states. Quotas cannot be influenced by local authorities nor by asylum seekers themselves. This removes potential bias from regional sorting. Additionally, we normalize the variables by the population in each district and include district fixed effects to account for time-invariant district characteristics.

In addition, the *Königsteiner Schlüssel* as well as the within-state allocation quotas are uncorrelated with local economic characteristics. The *Königsteiner Schlüssel* is mainly based on the population share of the federal state (Schmandt *et al.*, 2023). The within-state allocation quotas are defined by each federal state separately (see Online Appendix A.4). These quotas are mainly based on the population share in each district as well.²¹

²¹Brandenburg, North Rhine-Westphalia and Hesse are exceptions in this regard. In the federal state Brandenburg the population share, the area of municipalities, and the number of employees subject to social insurance contributions are considered. In North Rhine-Westphalia the population share and the area of the district relative

To empirically support the exogeneity of within-state allocation quotas, we estimate balance checks and a pre-trend regression. In Figure 4, we regress migrants p.c., GDP in the agriculture sector p.c., GDP in the manufacturing sector p.c., GDP in the service sector p.c., percentage change in GDP to the previous year, number of employees at work place p.c., number of employees with professional qualifications p.c., number of employees with academic qualification p.c., employees in the manufacturing sector p.c., employees in the trade sector p.c., employees in the finance sector p.c., number of unemployed people p.c., the income tax revenues p.c., and trade tax allocation on the instrument. All economic variables are lagged by one year and standardized. The effect is for all variables insignificant indicating that the allocation of asylum seekers according to within-state allocation quotas is independent of economic factors.

[Figure 4 goes here]

For the pre-trend regression we estimate in Figure 5 the effect of asylum seekers p.c., instrumented by the within-state allocation quotas, on lagged business registrations p.c. Business registrations p.c. are lagged by eight years such that the last year in the sample is related to the last year before the intake of asylum seekers in 2015. The coefficient is insignificant. This indicates that instrumented asylum seekers p.c. do not correlate with business registrations p.c. before 2015. In sum, the instrument asylum seekers p.c. according to within-state allocation quotas ensures plausibly exogenous variation of asylum seekers p.c. in German districts.

[Figure 5 goes here]

to the total area in North Rhine-Westphalia is considered. In Hesse the quotas according to population share decreases if the share of migrants exceeds specific levels. However, in all three states the population share is the main predictor for the quotas calculation. As a robustness check we excluded each federal state in Table A.2. The estimations only deviate briefly from the baseline estimation and are still positive and significant.

5 Results

Table 2 collects our baseline findings. It shows the OLS and IV results with and without control variables. Model (1) of Table 2 reports OLS estimates without control variables. The results suggest a positive relationship between asylum seekers p.c. and business registrations p.c. The effect is statistically insignificant. In Model (2) we include control variables. There is a positive and significant effect. Model (3) of Table 2 reports the first-stage results using the number of asylum seekers according to within-state allocation quotas as instrument. There is a strong and statistically significant relationship between the instrument and actual asylum seekers per capita. An increase of 10 asylum seekers according to within-state allocation guotas, increase actual asylum seekers by seven. Thus, the instrument is clearly relevant for the actual allocation of asylum seekers.

[Table 2 goes here]

Model (4) collects the second-stage results. There is a positive relationship between the instrumented asylum seekers and business registrations. The effect is statistically significant at the 5%-level. An increase of one asylum seeker per 100 inhabitants - roughly one standard deviation - increases business registrations per 100 inhabitants by nine. At the mean number of business registrations p.c. of 0.01, this corresponds to an increase of 9%. Model (5) and (6) of Table 2 show our preferred IV estimation with control variables. The coefficient estimate of the second-stage is somewhat smaller, however. An increase of one asylum seeker per 100 inhabitants by around seven. At the mean number of business registrations p.c. of 0.01, this corresponds to an increase of 7%.²²

Taken together, the IV estimation shows that an increase in asylum seekers per capita increases business registrations per capita in districts in Germany. Comparing the OLS to the IV results, the IV results are larger than OLS but point in the same direction. The coefficient of IV estimation is 2.5 times larger than the OLS regression with control variables in Model (2).

 $^{^{22}}$ Note that the first stage Kleibergen-Paap *F*-statistic is significantly different from zero and clearly shows that our instrument is sufficiently strong.

Hence, OLS seems to underestimate the effect of asylum seekers on business registrations. One reason for the downward-biased OLS estimation coefficient might be the endogenous allocation of actual asylum seekers to districts. Asylum seekers might be allocated to areas where economic conditions for business registrations were less favorable.²³

6 Robustness

We next show that our findings are robust to different specifications.²⁴ First, we estimate the effect of asylum seekers per capita on the log of business registrations per capita (rather than its level) with control variables. In Model (1) of Table 3 the second-stage result is positive and statistically significant. The effect is comparable in size to the baseline IV estimation.

Second, we estimate the effect of lagged asylum seekers per capita on business registrations per capita. Model (2) of Table 3 shows the second-stage result of asylum seekers per capita lagged by three years on business registrations per capita. The result is statistically significant and positive. The estimation is slightly higher than in the baseline estimation in Model (6) of Table 2. The result shows that with lagged asylum seekers the effect is still positive.

Third, in Model (4) we estimate the reduced form. The effect is statistically significant and positive. We find a qualitatively similar effect as in our baseline estimation.

Fourth, we exclude the federal states that have no internal allocation scheme. These are the city states Berlin and Hamburg as well as the federal state Saarland. Additionally, we excluded the city state Bremen as it is only divided into Bremen and Bremerhaven. Model (3) shows the second-stage regression. The effect is positive and statistically significant at the 5%-level. The

²³Asylum seekers were often allocated where there was free housing capacities like empty barracks or empty hotels. These areas had often not unfavorable economic conditions. Section A.3 in Online Appendix show that asylum seekers were often allocated to rural area with higher unemployment rate. Additionally, the measurement error of the Central Register of Foreigners and the overburdened local authorities in 2015/16 will underestimate the OLS estimation.

²⁴Further robustness checks can be found in the Online Appendix Section A.2.

effect is only slightly larger than our baseline estimation in Model (6) of Table 2. This shows that the city states and Saarland do not bias our results.

Fifth, Model (5) shows the estimation for West-German states only. One can see the second-stage result in West Germany.²⁵ There is a positive relationship but it is statistically insignificant. Considering that the sample size is smaller compared to the estimation in the baseline, it is not surprising that the estimation is insignificant. The baseline result in Model (6) of Table 2 is twice as large.

Sixth, in Table 3 in Model (6) we check the robustness regarding the calculation of the quotas. A detailed explanation about the responses of the ministries and how the quotas are calculated can be seen in the Online Appendix A.4. Model (6) shows the estimation with federal states which sent us quotas. The result is positive and slightly lower than our baseline estimation but statistically insignificant. Considering that the sample size is smaller compared to the estimation in the baseline, it is not surprising that the estimations differ. However, the effect is still positive and near the baseline coefficient.

[Table 3 goes here]

7 Heterogeneity

7.1 Economic Sectors

In the baseline specification, we find that asylum seekers increase business registrations. We now examine which economic sectors are affected. Figure 6 shows the results for all eleven economic sectors.²⁶ Asylum Seekers increase business registrations mainly in the manufacturing sector and sectors that offer end-consumer service.

²⁵We do not estimate the model for East-German states because the results were not meaningful. The sample size is small due to the small number of districts in East-German states and the standard errors are quite large. Moreover, the IV estimation was very weak with a Kleibergen-Paap Wald F-Statistic value of 0.00.

²⁶The sectors follow the classification of economic activities 2008 (WZ 2008) of the Federal Statistical Office of Germany. The sectors are aggregated according to the high-level SNA/ISIC (System of National Ac-

In 6 sectors the result is positive and statistically significant. Asylum seekers p.c. increase business registrations p.c. in the manufacturing sector (Manufacturing), service sector including trade, traffic, and catering (Trade, Traffic, Catering), information sector including software development and data processing (Information, Communication), finance and insurance sector (Finance, Insurance), other economic and scientific services including guard and security service (Other Economic & Scientific Services), and in the sector of real estate activities including leasing and maintenance (Real Estate Activities).

In three sectors, agriculture (Agriculture), mining, energy/water supply, waste disposal (Mining, Energy), and construction sector (Construction), the result is positive but statistically insignificant. The two sectors administration, education, health (Administration, Education, Health), and art, entertainment, provision of other services, manufacturing for the private household, exterritorial organizations (Art, Private Production, Exterritorial) have a negative and statistically insignificant result.²⁷

[Figure 6 goes here]

7.2 Gender by Founders

Next, we estimate whether asylum seekers have different effects on business registrations by men and women. Figure 7 shows that the more business were registered by men than by women. The result for men is highly statistically significant. The result for women is statistically insignificant. This supports the general development of business registrations in Germany. Women register in general less businesses than men. On a long-term average of the last five years, women are underrepresented at 39% compared to men. Women are already less inclined

counts/International Standard Industrial Classification of the United Nations) aggregation A*10/11. For a more detailed description see Online Appendix A.6

²⁷We also estimated the effect of aslyum seekers on business registrations according to primary, secondary, tertiary, quarternary, and quinary sectors. Business registrations increase in the secondary (manufacturing), tertiary (services to end-consumer and business) and quarternary (knowledge-based activities) sectors.

to start a business than men. In addition, women are more likey to set a up a freelance business (Viete *et al.*, 2022) and are therefore even more underrepresented in this data set.

[Figure 7 goes here]

7.3 Nationality by Founders

In Table 4, we investigate the nationality of the people who have registered the companies. Asylum seekers can increase business registrations whose founders are Germans or foreigners. The results show that the businesses are registered by founders where at least one of whom is German. Additionally, there is an increase in business registrations where at least one founder has a nationality from one of the top 10 asylum country.

Model (2) shows the estimation where at least one founder is German. The result is positive and statistically significant at 1%-level. An increase of 100 asylum seekers per capita increase business registrations by Germans by 5. At the mean number of business registrations p.c. by 0.01, this corresponds to an increase of 5%. Conversely, Model (3) shows the estimation of registrations where all founders are foreigners. The result is statistically insignificant. This indicates that asylum seekers increase the number of business registrations in which at least one founder is always German.

In Model (4) we estimate the effect of asylum seekers on business registrations where at least one founder is coming from the top 10 asylum countries. An increase of 1000 asylum seekers per capita increase business registrations with at least one founder from top 10 asylum countries by 4. The result is positive and statistically significant at 1%-level. At the mean number of 0.0003 this is an increase of 13%. This indicates that with increasing asylum seekers also refugees start to register their own business. Model (5) and Model (6) show the estimation with business registrations by Syrians and Afghans.²⁸ The results show that asylum seekers

²⁸The two countries from which most asylum seekers came to Germany in 2015/16 were Syria and Afghanistan.

increase business registrations by Syrians but not by Afghans. An increase of 1000 asylum seekers per capita increase business registrations by Syrians per capita by 6.

[Table 4 goes here]

7.4 Party Vote Share

Next, we estimate if the voting share of parties impacts the effect of asylum seekers on business registrations. We add the second vote share of the federal elections from 2009, 2013, 2017, and 2021 as an interaction term in Equation 2. The estimations show that right-wing parties decrease the effect of asylum seekers on business registrations. Conversely, a higher vote share for the left party increases the effect.

Figure 8 show the marginsplot of the estimation asylum seekers p.c. on business registrations p.c. with the vote share of right-wing parties²⁹ as an interaction term. The marginsplot shows the estimation with three different level of right-wing vote share, the minimum, mean, and maximum vote share. The plot shows that with an increasing vote share, the effect of asylum seekers on business registrations decreases. The estimation with the maximum vote share of right-wing parties has the lowest estimation effect of asylum seekers on business registrations. With increasing number of asylum seekers the effect becomes insignificant.

[Figure 8 goes here]

Conversely, Figure 9 shows the marginsplot with the vote share of the German left party. The marginsplot shows the estimation of asylum seekers p.c. on business registrations p.c. with the interaction term vote share of left party³⁰ with minimum, mean, and maximum vote share. With higher vote share of the left party the effect of asylum seekers on business registrations increases. The highest estimation effect is measured with the maximum vote share of the left party as an interaction term.

²⁹Right-wing parties are AfD, NPD, DVU, REP, Die Rechte, III Weg. The vote share of right-wing parties has a variance of 0.0039.

³⁰The left party has a variance of 0.0045.

8 Extension

In this section, we estimate the effect of asylum seekers on business deregistrations and the number of employees of new business registrations.

8.1 **Business Deregistrations**

As an extension, we estimate the effect of asylum seekers p.c. on business deregistrations p.c. Table 5 shows OLS and IV estimations with and without control variables of asylum seekers per capita on business deregistrations per capita. Our preferred Model is the IV regression with control variables in Model (6).

Model (1) of Table 5 reports OLS estimates without control variables. There is a negative relationship between asylum seekers p.c. and business deregistrations p.c. The effect is statistically insignificant. In Model (2) we include control variables. The effect becomes positive but statistically insignificant.

[Table 5 goes here]

In Model (3) we estimate the second-stage result for business deregistrations p.c. without control variables. There is a positive relationship between the instrumented asylum seekers and business deregistrations. However, the effect is statistically insignificant.

Model (4) shows the second-stage result for business deregistrations p.c. with control variables. The effect is positive. An increase of one asylum seeker per 100 inhabitants, increases business deregistrations per inhabitants by one.³¹ However, the result is again insignificant.

All Models show a statistically insignificant result and the coefficients are quite small. Taken together, the estimations indicate that asylum seekers have no effect on business dereg-

³¹Note that the first stage Kleibergen-Paap F-statistic is significantly different from zero and clearly shows that our instrument is sufficiently strong.

istrations. There is no indication that businesses are closed down or move to another district because of the arrival of asylum seekers.³²

8.2 Employees of New Business Registrations

As an addition extension, we estimate the effect of asylum seekers on employees of new business registrations.³³ The estimations show that asylum seekers increase the number of full-time employees by new business registrations.

Model (1) of Table 6 shows that an increase of 100 asylum seekers p.c. increase number of employees p.c. of new business registrations by 27. At the mean of employees of new business registrations of 0.01, this is an increase of 27%. The result is statistically significant at 1%-level. Model (2) and Model (3) show that the employees have a full-time position in the new businesses. In Model (2) asylum seekers p.c. increase full-time employees of new business registrations. The result is statistically significant at 1%-level. The result in Model (3) for part-time employees is insignificant. 100 asylum seekers p.c. increase business registrations p.c. by 7 and full-time employees p.c. by 27.

[Table 6 goes here]

9 Conclusion

Business registrations can increase economic growth and form new job positions. Considering the relatively low self-employment rate in Germany, it is interesting to identify what affects business registrations. With the relatively high number of asylum seekers in Germany in the last years, the question arises: Do asylum seekers increase business registrations? Asylum

³²We also estimate the effect of asylum seekers on population movement and found no evidence for chain migration of the inhabitants.

³³We also estimate the effect of asylum seekers on employees in a district in general and found a positive relationship. Asylum seekers increase the number of employees beyond the number of employees of new business registrations. However, this estimation is beyond the scope of this study.

seekers might increase business registrations by increasing demand for local goods, being a new workforce for new businesses or by registering a business on its own.

We analyze if asylum seekers have an impact on business registrations. We use data on business registrations combined with the number of asylum seekers from 2007 until 2021. To overcome endogeneity, we instrument asylum seekers per capita with within-state allocation quotas for asylum seekers.

We find that more asylum seekers per capita in a district increase business registrations per capita. An increase of one asylum seeker per 100 inhabitants - roughly one standard deviation -, increases business registrations per 100 inhabitants by seven. The result is supported by extensive robustness tests. The businesses are mainly registered in the manufacturing sector and sectors that offer end-consumer services. Most businesses are registered by men and have at least one German founder. Additionally, an increase of 100 asylum seekers increase number of employees in a district from new business registrations by 27. The majority of the new employees have a full-time position. Conversely, asylum seekers have no effect on business deregistrations, i.e. there is no indication that businesses are closed down or moved to other districts because of the arrival of refugees.

In future extensions we want to estimate the effect of business registrations on the local economy by estimating the effect on local GDP.

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Figure 1: Allocation of asylum seekers in Germany, 2016. This Map shows the allocation of asylum seekers per 100 inhabitants per district in year 2016. Figure (a) shows the allocation of actual asylum seekers per 100 inhabitants and (b) the allocation of asylum seekers according to within-state allocation quota per 100 inhabitants.



Figure 2: Number of asylum seekers in Germany, 2007-2021. This graph shows the development of the number of asylum seekers from 2007 to 2021 in Germany.



Figure 3: Business Registrations in Germany over time, 2007-2021. This graph shows the development of the number of total business registrations p.c. and from people with nationality of the top 10 asylum countries per total number of people coming from asylum countries living in Germany from 2007 to 2021. The registrations are aggregated per year and divided by the number of business registrations of the base year 2007.



Figure 4: Balancing Test: Endogeneity of within-state allocation Quotas. This figure shows coefficients from regressing the number of asylum seekers according to quotas on various district characteristics. All variables are lagged by one year and standardized. The variables are migrants p.c., GDP in the agriculture sector p.c., GDP in the manufacturing sector p.c., GDP in the service sector p.c., percentage change in GDP to the previous year, number of employees at work place p.c., number of employees with professional qualifications p.c., number of employees with academic qualification p.c., employees in the manufacturing sector p.c., the income tax revenues p.c., and trade tax allocation. Regressing include year and district fixed effects. Standard errors are clustered at the district level. 90% and 95% confidence intervals are indicated in the graph.



Figure 5: Pre-Trend Test: Effect of Asylum Seekers on Business Registrations, lagged by 8 years. This figure shows the pre-trend test of instrumented asylum seekers on business registrations. The variable business registrations is lagged by eight years. 90% and 95% confidence intervals are indicated in the graph.



Figure 6: Effect of Asylum Seekers on Business Registrations, by Economic Sectors. The figure shows the estimation of instrumented asylum seekers p.c. on business registrations p.c. according to different economic sectors. The sectors are manufacturing, finance and insurance, trade, traffic and catering, information and communication, other economic and scientific services, real estate activities, construction, agriculture, mining and energy supply, administration, education and health services, and art, entertainment, private production and exterritorial services. All variables are standardized. 90% and 95% confidence intervals are indicated in the graph.



Figure 7: Effect of Asylum Seekers on Business Registrations, by Gender. The figure shows the estimation of instrumented asylum seekers p.c. on business registrations p.c. according to gender (men and women). Both variables are standardized. 90% and 95% confidence intervals are indicated in the graph.



Figure 8: Marginsplot: Right-Wing Parties Voting Share. This graph shows the marginsplot of business registrations p.c. to instrumented asylum seekers p.c. with minimum, mean, and maximum vote shares of right-wing parties from the 2009, 2013, 2017, and 2021 federal elections. The variance of the vote share of right-wing parties is 0.0039. Right-wing parties are AfD, NPD, DVU, REP, Die Rechte, III Weg. 90% and 95% confidence intervals are indicated in the graph.



Figure 9: Marginsplot: Left Party Voting Share. This graph shows the marginsplot of business registrations p.c. to instrumented asylum seekers p.c. with minimum, mean, and maximum vote shares of the left party from the 2009, 2013, 2017, and 2021 federal elections. The variance of the vote share of the left party is 0.0045. 90% and 95% confidence intervals are indicated in the graph.

Variable	Mean	Min.	Max.	SD	Obs.
Business Registrations (BR) p.c.	0.0087	0.003	0.035	0.00	5895
Asylum Seekers p.c.	0.0116	0.000	0.130	0.01	5895
Asylum Seekers Quota p.c.	0.0121	0.000	0.056	0.01	5847
BR by Gender					
BR Men p.c.	0.0067	0.000	0.028	0.00	5544
BR Women p.c.	0.0028	0.000	0.009	0.00	5544
BR by Nationality					
BR German p.c.	0.0070	0.003	0.014	0.00	5895
BR Foreigners p.c.	0.0017	0.000	0.026	0.00	5895
BR Top 10 p.c.	0.0003	0.000	0.002	0.00	5895
BR Syrian p.c.	0.0000	0.000	0.001	0.00	5895
BR Afghan p.c.	0.0000	0.000	0.000	0.00	5895
Employess of BR					
Employees p.c.	0.0084	0.000	0.382	0.01	5895
Full-Time Employees p.c.	0.0058	0.000	0.381	0.01	5895
Part-Time Employees p.c.	0.0027	0.000	0.299	0.00	5895
Economic Sectors BR					
Agriculture p.c.	0.0001	0.000	0.001	0.00	5544
Mining, Energy p.c.	0.0003	0.000	0.004	0.00	5544
Manufactuing p.c.	0.0004	0.000	0.002	0.00	5544
Construction p.c.	0.0010	0.000	0.011	0.00	5544
Trade, Traffic p.c.	0.0029	0.000	0.007	0.00	5544
Information p.c.	0.0003	0.000	0.002	0.00	5544
Finance, Insurance p.c.	0.0003	0.000	0.001	0.00	5544
Real Estate Activities p.c.	0.0002	0.000	0.002	0.00	5544
Administration p.c.	0.0011	0.000	0.007	0.00	5544
Other Economic Services p.c.	0.0018	0.000	0.012	0.00	5544
Private Production p.c.	0.0002	0.000	0.001	0.00	5544
Control Variables					
GDP p.c.	0.0338	0.012	0.196	0.02	5895
Business tax multiplier	379.2182	223.000	893.000	49.52	5893
Population density	526.9336	35.580	4789.840	690.53	5109
Migrant p.c.	0.0891	0.006	0.439	0.06	5895
Population Tsd.	208.7631	33.944	3677.472	241.55	5895
Vote Share					
Voting Share Left Party	0.0839	0.016	0.374	0.07	1572
Voting Share Right-Wing Parties	0.0845	0.004	0 373	0.06	1572

Table 1: SUMMARY STATISTICS - VARIABLES

Notes: This table reports summary statistics of the outcome variable business registrations per capita, the treatment variable asylum seekers per capita, the variable instrument asylum seekers according to quotas per capita, business registrations of men p.c., business registrations where at least one founder is German p.c., business registrations where at least one founder comes from the top 10 asylum countries, business registrations where at least one founder comes from the top 10 asylum countries, business registrations where at least one founder comes from the top 10 asylum countries, business registrations where at least one founder comes from the top 10 asylum countries, business registrations where at least one founder is Afghan p.c., number of employees from new business registrations p.c., business registrations in agricultural sector p.c., business registrations in trade, traffic and catering sector p.c., business registrations in construction sector p.c., business registrations in trade, traffic and catering sector p.c., business registrations sector p.c., business registrations in real estate activities sector p.c., business registrations, education and health sector p.c., business registrations in real estate activities sector p.c., business registrations, education and health sector p.c., business registrations in other economic and scientific sector p.c., business registrations, exterritorial sector p.c., for the control variables gross domestic product per capita, business tax multiplier, population density and number of migrants per capita and the number of populations per 1000 inhabitants, and additionally the vote share of the left and right-wing party in Germany from the federl elections between 2007 and 2021 per capita. It indicates the mean, minimum value (Min), and maximum values (Max), the standard deviation (SE), as well as the number of observations (Obs.).

	OLS		IV				
	(1)	(2)	(3) First Stage	(4) Second Stage	(5) First Stage	(6) Second Stage	
IV Quote p.c.			0.710***		0.703***		
			(0.088)		(0.077)		
Asylum Seekers p.c.	0.002	0.027*		0.090**		0.070**	
	(0.008)	(0.016)		(0.040)		(0.030)	
Mean (SD)	0.01 (0.00)	0.01 (0.00)	0.01 (0.01)	0.01 (0.00)	0.01 (0.01)	0.01 (0.00)	
District FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
Controls		\checkmark			\checkmark	\checkmark	
Kleibergen-Paap Wald F				65.07		83.01	
Ν	5,895	5,107	5,847	5,847	5,066	5,066	

Table 2: IV RESULTS – ASYLUM SEEKERS AND BUSINESS REGISTRATIONS

Notes: This table collects results from OLS and IV regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Model (1) and (2) show the OLS regression with and without control variables. We estimate two IV estimations for business registrations, one without controls variables (Model 4) and one with control variables (Model 6). Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states (Models (3) and (5)). The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

	(1) Logarithm	(2) Lag t-3	(3) Reduced	(4) w/o HB etc.	(5) West Ger.	(6) Answer
IV Quote p.c.			0.049**			
			(0.023)			
Asylum Seekers p.c.	6.899***			0.074***	0.038	0.055
	(2.213)			(0.028)	(0.028)	(0.039)
lag t-3 Asylum Seekers p.c.		0.089**				
		(0.042)				
Mean (SD)	-4.79 (0.26)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)
District FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Controls	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Kleibergen-Paap Wald F	83.01	45.82		82.69	101.59	68.38
Ν	5,066	4,677	5,066	5,001	4,106	3,701

Table 3: ROBUSTNESS CHECKS – ASYLUM SEEKERS AND BUSINESS REGISTRATIONS

Notes: This table collects second-stage results from IV regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Model (1) show the second stage regression of logarithmized business registrations p.c., Model (2) regression of lagged estimation by three years, Model (3) the reduced form, Model (4) without the federal state Bremen, Hamburg, Berlin, and Saarland, and Model (5) shows the result of the estimation with federal states in West Germany. Model (6) shows the second-stage regression with federal states who sent us the quotas. Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

	(1) Baseline	(2) at least one German	(3) only Foreigners	(4) at least one Top 10	(5) at least one Syrian	(6) at least one Afghan
Asylum Seekers p.c.	0.070**	0.052***	0.018	0.004***	0.006***	0.000
	(0.030)	(0.012)	(0.030)	(0.001)	(0.001)	(0.000)
Mean (SD)	0.01 (0.00)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
District FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Controls	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Kleibergen-Paap Wald F	83.01	83.01	83.01	83.01	83.01	83.01
Ν	5,066	5,066	5,066	5,066	5,066	5,066

Table 4: IV RESULTS - ASYLUM SEEKERS AND BUSINESS REGISTRATIONS, BY NATIONALITIES

Notes: This table collects results from IV regressions that relate business registrations per capita from Germans, Foreigners, people from top 10 asylum countries, Syrians, and Afghans to the number of asylum seekers per capita in a district. Model (1) shows the baseline estimation, Model (2) the estimation where at least one founder is Germans, Model (3) where all founders are Foreigners, Model (4) where at least one founder is originating of top 10 asylum countries, Model (5) where at least one founder is Syrian, and Model (6) the estimation where at least one founder is Afghan with control variables. Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

	OLS		IV		
	(1)	(2)	(3) Second-Stage	(4) Second-Stage	
Asylum Seekers p.c.	-0.005 (0.007)	0.011 (0.012)	0.026 (0.031)	0.013 (0.027)	
Mean (SD)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	
District FE	\checkmark	\checkmark	\checkmark	\checkmark	
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	
Controls		\checkmark		\checkmark	
Kleibergen-Paap Wald F			65.07	83.01	
Ν	5,895	5,107	5,847	5,066	

 Table 5: IV – ASYLUM SEEKERS AND BUSINESS DEREGISTRATIONS

Notes: This table collects results from OLS and IV regressions that relate business deregistrations per capita to the number of asylum seekers per capita in a district. Model (1) and (2) show the OLS regression with and without control variables. We estimate two IV estimations for business deregistrations, one without controls variables (Model 3) and one with control variables (Model 4). Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

	(1) Employees	(2) Full-Time Employee	(3) Part-Time Employee	
Asylum Seekers p.c.	0.272***	0.286***	-0.015	
	(0.098)	(0.088)	(0.029)	
Mean (SD)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	
District FE	\checkmark	\checkmark	\checkmark	
Year FE	\checkmark	\checkmark	\checkmark	
Controls	\checkmark	\checkmark	\checkmark	
Kleibergen-Paap Wald F	83.01	83.01	83.01	
Ν	5,066	5,066	5,066	

 Table 6: IV – Asylum Seekers and Business Registrations by Employees

Notes: This table collects second-stage results from IV regressions that relate employees of business registrations per capita to the number of asylum seekers per capita in a district. Model (1) shows the estimation on number of employees from business registrations, Model (2) on the number of full time employees of business registrations, Model (3) on the number of part time employees of business registrations. Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

Online appendix

A.1 Additional figures



Figure A.1: Distributions – Asylum seekers and Business registrations. The figure shows the histograms of (a) aslyum seekers p.c. and (b) business registrations over the period 2007-2021 in Germany



Figure A.2: Asylum Seekers p.c. on Asylum Seekers p.c. quota. Binscatter plot of asylum seekers p.c. on asylum seekers p.c. according to within-state allocation quotas.



Figure A.3: Asylum Seekers p.c. on Economic Variables and Vote Share. Coefplot asylum seekers p.c. on economic variables unemployment rate lagged by one year, migrants p.c. lagged by one year, vote share right-wing parties, CDU, SPD, FDP, Grüne, Left party of federal election, and rural region. All variables are standardized. 90% and 95% confidence intervals are indicated in the graph.

A.2 Additional Robustness Checks

	(1) Baseline	(2) Lag t-1	(3) Lag t-2	(4) Urban	(5) Rural	(6) w/o ind. cities
Asylum Seekers p.c.	0.070**			0.060**	0.115***	0.036***
	(0.030)			(0.029)	(0.041)	(0.013)
lag t-1 Asylum Seekers p.c.		0.079**				
		(0.033)				
lag t-2 Asylum Seekers p.c.			0.079**			
			(0.036)			
Mean (SD)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)
District FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Controls	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Kleibergen-Paap Wald F	83.01	59.63	54.78	32.24	70.54	193.30
Ν	5,066	5,066	5,065	2,586	2,480	3,744

Table A.1: ROBUSTNESS CHECKS – ASYLUM SEEKERS AND BUSINESS REGISTRATIONS II

Notes: This table collects second-stage results from IV regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Model (1) show the second stage regression of the baseline regression, Model (2) regression of lagged estimation by one year, Model (3) regression of lagged estimation by two years, Model (4) estimation in urban area, and Model (5) shows the results of the estimation in rural area. Model (6) shows the second-stage regression without independent cities. Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

	(1) w/o NRW	(2) w/o HE	(3) w/o BB	(4) w/o BW	(5) only Restric- tive States	(6) w/o small AS
Asylum Seekers p.c.	0.075** (0.037)	0.038** (0.018)	0.065** (0.029)	0.072** (0.031)	0.055* (0.033)	0.070** (0.030)
Mean (SD)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)
District FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Year FE	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Controls	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Kleibergen-Paap Wald F	57.95	77.87	94.93	77.56	85.08	83.03
Ν	4,377	4,741	4,847	4,535	3,157	5,064

Table A.2: ROBUSTNESS CHECKS – ASYLUM SEEKERS AND BUSINESS REGISTRATIONS III

Notes: This table collects second-stage results from IV regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Model (1) show the second stage regression without North Rhine-Westphalia, Model (2) regression without Hesse, Model (3) regression without Branden, and Model (4) estimation without Baden-Wuerttemberg. Model (5) show the estimation only with federal states who apply strict positive allocation and Model (6) excludes districts with small number of asylum seekers (smallest 10 % percentiles). Regressions include district and year fixed effects. To account the endogeneity of the asylum seekers allocation to districts in Germany, we instrument the number of asylum seekers per capita with the quotas for allocation of asylum seekers defined by the federal states. The row entitled Mean (SD) reports the mean and standard deviation of the dependent variable for each regression. Stars indicate significance levels at 10%(*), 5%(**) and 1%(***). Heteroscedasticity and cluster-robust standard errors in parentheses. The unit of clustering is the district.

A.3 Business Registrations in Germany

In principle, anyone in Germany who is of legal age and legally competent can register a business (freedom of trade). However, in some sectors a certificate of qualification to exercise the profession must be available, e.g. a master craftsman's examination. In addition, a trade can be prohibited if the trader is unreliable and the prohibition is necessary to protect the general public and the employees in the business. This may be the case in the event of high tax debts or non-payment of social security contributions. The data on business registrations does not include liberal professions like medical doctors, artists, lawyers or architects, primary production, such as agriculture, forestry or mining, and insurance brokers. The business notification is carried out by means of a questionnaire. Copies of these registrations and deregistrations are statistically evaluated. The data are checked for plausibility at the statistical offices of the federal states and corrected if necessary. Since the business registration statistics are a complete survey, no extrapolation is necessary. It should be noted that the statistic might overestimate the registrations because in some cases it is not possible to find out whether the registration is a declaration of intent or if the business became economically active.

A.4 Within-State Allocation Quotas

In Germany, asylum seekers are allocated towards the districts by within-state allocation quotas. Every federal state has defined by law how to allocate asylum seekers from the initial reception facility towards their districts. The quotas differ between the states. Some states distribute their asylum seekers according to the population share and adapt the quotas frequently, other set fixed quotas and other states consider the area of the districts. A more detailed overview is provided in Table A.3.

To receive the quotas we contacted the ministries in each federal state responsible to determine the quotas. The federal states Berlin, Hamburg, Bremen and Saarland were excluded because the refugees there were distributed according to the *Königsteiner Schlüssel* or in Bre-

State	Allocation
Baden-Wuerttemberg	population share
Bavaria	population share
Berlin	Königsteiner Schlüssel
Brandenburg	population share, cadaster areas
	municipalities, state and employees
	social insurance contributions
Bremen	fixed quotas set by law
Hamburg	Königsteiner Schlüssel
Hesse	population share and
	proportion foreign nationals
Mecklenburg-West Pomerania	population share relative
	inhabitants in state
Lower Saxony	population share
North Rhine-Westphalia	population share relative to
	population in NRW and share of
	area relative to NRW areas
Rhineland Palatinate	population share
Saarland	merged districts in data
Saxony	population share from previous years
Saxony-Anhalt	population share
Schleswig-Holstein	population share relative
	to state population
Thuringia	fixed quotas set by law

 Table A.3: WITHIN-STATE ALLOCATION QUOTAS FOR DISTRIBUTING ASYLUM SEEKERS

men according to the law (80% Bremen, 20% Bremerhaven). In total we contacted 12 federal states and received seven answers. Table A.4 shows a detailed overview how we calculated the quotas. Where we received no answer and there was no fixed quota set in the law, the law stated that the quotas were calculated based on the population share. In this case, we calculated the quotas based on the population share of the federal state. For the federal state Baden-Wuerttemberg we only received monthly quotas from the year 2015 until 2021. To calculate the quotas for the years before 2007, we calculated the average yearly quota from 2015 until 2021 and used this quota for the whole period 2007 - 2021. In a similar way we calculated the quotas for North Rhine-Westphalia. There we received weekly quotas from 2018 until 2021. Again we calculated the average yearly quota and used them for the time period 2007 until 2021. In neither federal state the quota varied largely over time therefore we had

no large bias by using yearly average quotas. In Table A.2 we excluded in Model (1) North Rhine-Westphalia and in Model (4) Baden-Wuerttemberg as a robustness check. Both results are statistically significant and deviate only briefly from the baseline estimation.

Answer	Calculation
Yes	average value from monthly Quotas 2015 until
	2021
Yes	fixed quotas according to law
/	Königsteiner Schlüssel
Yes	fixed quota according to law
/	fixed quotas set by law
/	Königsteiner Schlüssel
Yes	fixed quotas
No	calculation based on population share
No	calculation based on population share
Yes	average value from weekly quotas from 2018
	until 2021
Yes	yearly quotas
/	Königsteiner Schlüssel
Yes	fixed quotas
No	calculation based on population share
No	calculation based on population share
No	fixed quotas set by law
	Answer Yes Yes / Yes / / Yes No Yes / Yes / Yes No No No No

Table A.4: EMAIL CORRESPONDENCE WITH THE AUTHORITIES REGARDING QUOTAS

A.5 Legal regulations on entrepreneurship

In Germany, individuals who come to Germany are allowed to be self-employed and register an business under specific circumstances. If individuals come to Germany and apply for asylum, they are divided into different protection statuses. The statuses depend on the status of the asylum decision, if it is still open, granted (temporary or unlimited) or if it is denied. Depending on the protection status, a business registration is either directly allowed, needs permission from the responsible government agency or is not allowed.

An asylum seeker with an open asylum decision (open protection status) might be able to be self-employed if he or she gets the permission by the responsible government agency. If individuals are granted asylum (temporary protection from asylum process) in Germany and become official refugees, they are allowed to be self-employed. A more detailed overview is provided in Table A.5.

Schutzstatus	§ §	Entrepreneurship
open protection status (of- fener Schutzstatus)	§ 63a AsylG	possible
	§ 55 AsylG	possible
	§ 7 AufenthG	possible
temporary protection status from asylum process (<i>befr.</i> <i>Schutz Asyl</i>)	§ 25 Abs. 1 AufenthG	yes
- /	§ 25 Abs. 2 S. 1 Nr. 1 AufenthG	yes
	§ 25 Abs. 2 S. 1 Nr. 2 AufenthG	yes
	§ 25 Abs. 3	yes
temporary protection without asylum process (<i>befr Schutz</i> <i>NoAsyl</i>)	§ 22 AufenthG	yes
10011591)	8 23 Abs 1 AufenthG	possible
	§ 23 Abs 2 AufenthG	ves
	§ 23 Abs. 4 AufenthG	ves
	§ 24 AufenthG	ves
	§ 23a AufenthG	ves
	§ 25 Abs. 4 AufenthG	possible
	§ 25 Abs. 5 AufenthG	ves
	§ 25a AufenthG	yes
	§ 25b AufenthG	yes
unlimited protection status (unbefr Schutz)	§ 23 Abs. 2 AufenthG	yes
	§ 26 Abs. 3 AufenthG	yes
without protection (ohne Schutz)		no
tolerated (geduldet)	§ 60a AufenthG	possible
latent obliged to leave the country (<i>latent</i>)	§ 50 Abs. 1 AufenthG	no
enforceable to leave the coun- try (<i>vollziehbar</i>)	§ 58 Abs. 2 AufenthG	no

Table A.5:	LEGAL	REGUI	ATIONS	ON	ENTR	EPREN	JEUR	SHIP
14010 11.01	LLOAL	REGUL	1110110	011			LOIG	51111

"Yes" means that one can become self-employed and register with the tax office and trade office without any other residence title or permission from the foreigners' authority. "Possible" means that one needs a permission of the aliens authority and apply § 21 Abs. 6 AufenthG (Perspektive neuStart e.V., 2023).

A.6 Economic Sectors

The classification of economic activities, issue 2008 (WZ 2008) is used to record the economic activities of statistical units in all official statistics in a standardized way. The Federal Statistical Office has created the classification with the intensive involvement of data users and data producers in administration, business, research and society. The classification consider the requirements of the statistical classification of economic activities in the European Community (Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) Revision 2). The European Commission has given its approval in accordance with Article 4, paragraph 3, of the above-mentioned regulation and is based on the International Standard Industrial Classification of the United Nations (ISIC Rev. 4). We use the highlevel SAN/ISIC (System of National Accounts/International Standard Industrial Classification of the United Nations) aggregation A*10/11 (Federal Statistical Office of Germany, 2008). A more detailed description about the economic sectors and what they include is provided in Table A.6.

Economic Sector	Detail
Agriculture	Agriculture, forestry, fishing
Mining, Energy	Mining and quarrying, energy and gas supply, water supply,
	waste disposal, waste management and pollution abatement
Manufacturing	Manufacturing of nourishment, drinks, tobacco, textiles,
	wood, paper, chemical products, plastic, glassware, metal
	products, cars, furniture
Construction	Building construction, civil engineering
Trade, Traffic, Catering	Wholesale, retail, trade with automobiles, shipping, avi-
	ation, land transportation, warehousing, accommodation,
	catering
Information, Communication	Publishing, film distribution, cinemas, software develop-
	ment, data processing
Finance, Insurance	Finance and insurance services
Real Estate Activities	Leasing, building management
Other Economic & Scientific	Provision of freelance, scientific and technical services,
Services	other economic services including rental of movable prop-
	erty, placement of workers, guard & security services, travel
	agencies, building management, landscaping
Administration, Education,	Public administration and provision other services includ-
Health	ing public administration (e.g. in the fields of health care,
	education, culture, social services), defense, social secu-
	rity, interest groups, church and other religious associations,
	repair of data processing equipment and consumer goods,
	provision of other mainly personal services (laundry, hair-
	dresser, cosmetics, funeral, sauna), education, health care
	and social services
Art, Private Production, Ex-	Art, Entertainment, creative artistic and entertainment activ-
territorial	ities, libraries, museums, lottery, sports, private households
	with domestic staff, production of goods and provision of
	services by private households for own use without a dis-
	tinct focus, exterritorial organizations

Table A.6: DETAIL DESCRIPTION ECONOMIC SECTORS