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## Asylum Seekers, New Businesses, and Job Creation

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# ASYLUM SEEKERS, NEW BUSINESSES, AND JOB CREATION

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## Abstract

How do asylum seekers affect host-country economies from a supply and demand perspective? What share of such immigration shocks is absorbed by existing vs. new businesses? To study these questions, we combine exclusive business registration and asylum seeker data for the universe of German districts over 2007-2021. We address endogeneity in asylum seeker allocation by exploiting rule-based allocation quotas as an instrument. A one SD treatment (10 asylum seekers/1,000 inhabitants) leads to 0.7 new businesses (7.9% increase) including 2.7 full-time jobs per 1,000 inhabitants. A sector-level analysis suggests that the founding of new businesses is both supply- (additional workforce) and demand-driven (need for basic goods/services), while the demand effect kicks in first. District-level employment data shows that total job creation is about four times larger, suggesting that 75% of the immigration shock is absorbed by existing businesses.

**Keywords:** asylum seekers, business registrations, host-country economy

**JEL codes:** F22, J20, L26

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# 1 Introduction

How asylum seekers impact host-country economies is a question that is high on the agenda in both academic and political debates. A preliminary conclusion appears to be that while providing for individuals seeking protection is costly at first, Western societies facing substantial demographic shifts and labor shortages may benefit eventually (Card, 2005). The question remains under which circumstances net economic effects are positive and how they come about. Meanwhile, asylum seeker numbers for Germany and other parts of Western Europe (mostly including Afghans and Syrians escaping war and humanitarian crises) have surged since 2015. *Asylum seekers* turn into *refugees* if they are granted asylum eventually.<sup>1</sup> For brevity, in most of the paper we use the term asylum seekers to refer to both groups.

Previous literature considers immigration mostly as a labor supply shock affecting the size and skill mix of the workforce and quantifies effects on wages and employment (Bohnet *et al.* (2025); Delgado-Prieto (2024); Dustmann *et al.* (2017); Foged and Peri (2016); Glitz (2012)).<sup>2</sup> Only a small part of the literature examines the absorption of higher demand for basic goods/services and resulting employment opportunities and wage increases for the native workforce (Berbée *et al.* (2022); Borjas and Monras (2017)). Our paper builds on both literatures and is the first (i) to study the causal effect of asylum seekers on the registration of new businesses highlighting the temporal pattern of demand- and supply-side effects and (ii) to quantify the relative size of absorption across new and existing businesses in a unified setting (i.e., the universe of German districts).

New businesses can be an important engine for economic growth and job creation promoting innovation and the diffusion of new knowledge (Audretsch *et al.*, 2006). In Germany, the self-employment rate is traditionally low compared to other EU countries and has even declined

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<sup>1</sup>Over 50% of asylum seekers since 2015 have been granted refugee status (BAMF, 2022).

<sup>2</sup>There is also a literature that studies effects of immigration as a labor supply shock on specific firm-level outcomes of existing firms. An example is Mitaritonna *et al.* (2017) studying effects on the productivity of French manufacturing firms, depending on their size and initial productivity levels. The authors find positive effects that are also associated with faster capital growth, larger exports, and higher wages for natives.

further in recent years: over 2000-2021 self-employment rates in Spain, Poland, or Italy were on average 17.4%, 23.2%, and 25.2%, compared to 11% in Germany (World Bank, 2023).<sup>3</sup> In this paper, we focus on newly-founded businesses as an outcome and rely on exclusive fine-grained data on local business registrations in the universe of about 400 German districts.<sup>4</sup> Our goal is to estimate the causal effect of asylum seekers on the number of new businesses registered based on an IV strategy that exploits a rule-based allocation of asylum seekers (i.e., a dispersal policy) to districts over 2007-2021.

In theory, three channels contribute to a positive effect of asylum seekers on business registrations: (i) demand-side effects through demand for basic goods/services, (ii) supply-side effects through additional labor (iii) or supply-side effects through a larger (and more diverse) pool of founders. First, hosting more asylum seekers can lead to new business registrations due to shifts in demand patterns. *Berbée et al. (2022)* show that asylum seekers demand housing, food, public services, and other subsistence goods and thereby create employment for natives in public administration, temporary agency work, and finance/insurance/real estate sectors. Second, asylum seekers granted asylum often become employed. The IAB-BAMF-SOEP survey of refugees indicates that 49% of refugees who came to Germany in 2013-2016 had regular employment after five years (*Brücker et al., 2020*). Through an expansion of the local workforce coupled with a skill distribution different from natives asylum seekers may motivate natives to start new businesses. Third, asylum seekers themselves may found businesses. Based on the German microcensus, *Leicht et al. (2021)* report a refugee self-employment rate of 8.1% in 2019. Founding a business is attractive, e.g., when facing discrimination in the regular labor market (*Constant and Zimmermann, 2006*). Building on these channels, our first hypothesis is that more asylum seekers lead to more business registrations.

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<sup>3</sup>Self-employment based on survey data is an often-used but imprecise measure of entrepreneurship. Nascent entrepreneurs are often employed elsewhere while developing a business and are thus typically classified as employed (*Parker, 2018*). As we do not rely on survey data but on business registrations, in our context business ownership implies self-employment and we will therefore use both terms throughout the paper.

<sup>4</sup>*Parker (2018)* notes that there is no common definition of entrepreneurship. Our outcome captures small firms, business ownership and replicative rather than innovative entrepreneurship (more of the same products).

We also formulate an opposing second hypothesis: more asylum seekers lead to fewer new businesses being registered. Batut and Schneider-Strawczynski (2022) show that the opening of small housing centers for refugees in France has decreased local economic activity and in turn shrunk the local population by 2%.<sup>5</sup> This adds to an established literature on so-called displacement effects, i.e., a shrinking of the native population due to immigration (Card, 2001; Borjas, 2006; Fernández-Huertas Moraga *et al.*, 2019). A resulting smaller customer base and native workforce may discourage people from setting up new businesses suggesting a negative effect of asylum seekers on business registrations.

Against the backdrop of the two opposing hypotheses, we analyze the effect of asylum seekers on new business registrations using annual 2007-2021 data on the universe of German districts (*Kreise*).<sup>6</sup> Asylum seekers are allocated to German districts via predetermined rule-based quotas. Yet, these quotas are often not fulfilled. Hence, the allocation is partially endogenous and OLS estimates are likely biased. Asylum seekers are often allocated to rather rural areas where housing is abundant. On the one hand, rural areas have a smaller customer base and a smaller local workforce, making new businesses less likely. On the other hand, there is less local competition and therefore more room for new businesses being founded. From a theoretical viewpoint, OLS may thus over- or underestimate the true effect.<sup>7</sup>

To address endogeneity in asylum seeker allocation, we use an IV approach. Our instrument is based on hand-collected information on rule-based allocation quotas.<sup>8</sup> Each of the 16 federal states defines which variables determine its state-specific quotas for the allocation of

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<sup>5</sup>In contrast, Gamalerio *et al.* (2023) show that in Italy the opening of refugee centers has improved the provision of local amenities (e.g., schools) and led to local population growth. Glitz *et al.* (2023) conduct an analysis at the 1km x 1km grid cell level for Germany and also show that refugees do not displace locals (via higher housing prices, etc.) and contribute to an improvement of local amenities.

<sup>6</sup>Our data covers 393 instead of the 401 official districts as some districts jointly organize refugee allocation.

<sup>7</sup>In Section 6.1, we report null results for OLS estimations. Compared to our IV results, OLS estimates are thus downward biased likely due to asylum seekers often being accommodated in economically less favorable areas.

<sup>8</sup>Previous studies also rely on quotas, albeit for a shorter time span. Berbée *et al.* (2022) estimate the effect of asylum seekers on local employment of native Germans based on biannual 2014-2017 data using the presence of

asylum seekers to its districts. The quotas are typically based on the annual share of the state population living in a district, i.e., more populous districts receive more asylum seekers. Some states have fixed quotas which they adjust every few years. Our first-stage results indicate a strong and significantly positive relationship between the quotas and asylum seekers per district. Balance tests show that the quotas are not systematically correlated with pre-determined economic, fiscal, or political district characteristics.

We obtain exclusive data on the universe of business registrations for 2007-2021 from the Research Data Center of the German Federal Statistical Office (*Forschungsdatenzentrum (FDZ) des Statistischen Bundesamtes*). Following a special request, the FDZ provided us with data on new business registrations by sector, gender and nationality of business owner(s) as well as the number of people to be employed by the new businesses at the district-year level. Data on the number of asylum seekers per district is based on the Central Register of Foreigners (*Ausländerzentralregister*). Finally, we have hand-collected information on within-state allocation quotas by reaching out to the government agencies in charge by email.

We make three contributions to the literature. First, we hand-collect information on rule-based allocation quotas for 2007-2021 and use them as an instrument to estimate the causal effect of asylum seekers on new business registrations. Second, we obtain exclusive data on the sectors of new businesses and on the nationality of founders to study how supply- and demand-side channels contribute to the baseline effect. Third, we obtain data on business deregistrations as well as the number of jobs created by the new businesses. This allows us to quantify (i) to what extent new businesses replace existing businesses and (ii) how much of the positive economic stimulus due to immigration is absorbed by new vs. existing businesses (comparing job creation overall with job creation in new businesses).

Our IV results show that a one SD increase in asylum seekers ( $\approx 10$  additional asylum seekers) per 1,000 inhabitants leads to 0.7 new businesses per 1,000 inhabitants (7.9% increase). Several robustness tests confirm this finding. Further analysis allows us to uncover

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military barracks and allocation quotas as instruments. Lange and Sommerfeld (2024) use the quota instrument to estimate the effect of refugees on crime rates in Germany for 2013-2018.

underlying mechanisms. Based on a sector-level breakdown of the new businesses, we find that our baseline result is driven both by supply- and demand-side effects. The demand-side effect materializes in the year of the shock and persists thereafter. In contrast, the supply-side effect due to asylum seekers finding employment is significant only in  $t+2$  and  $t+3$ . This seems reasonable as it takes time for asylum seekers to receive a work permit typically being the case once they are granted asylum and become refugees. Finally, we find that almost all new businesses are registered by a single founder with German citizenship.

We also provide results for several extensions that make us confident that asylum seeker intake has positive welfare effects from an economic perspective. A one SD increase in asylum seekers creates 2.7 full-time jobs in newly registered businesses per 1,000 inhabitants.<sup>9</sup> In addition, based on publicly available labor market data, we find that overall 10.9 additional full-time jobs are created. If we use job creation as a measure of economic absorption of the immigration shock, 25% of the absorption accrues to the new businesses, whereas the bulk of absorption is borne by existing businesses. Additional estimations taking into account deregistrations of businesses show that the new businesses hardly, if at all, displace existing businesses.

## 2 Related literature

Our paper primarily relates to the literature on the effect of asylum seekers on host-country economies, jointly considering demand- and supply-side effects. Peri *et al.* (2024) study Hispanic immigration to Orlando after Hurricane Maria hit Puerto Rico in 2017 and identify demand- (retail and hospitality sector) and supply-side effects (construction sector), i.e., the new immigrants found employment in the construction sector and were in need of basic goods/services, overall giving rise to positive economic effects. We extend these findings by a sector-level analysis allowing us to trace demand- and supply-side effects over time. Demand-side effects likely show up already in the year of the shock as basic goods/services are necessary immediately. On the other hand, integrating asylum seekers into the labor market takes time,

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<sup>9</sup>Combined with 0.7 new businesses, this means that any new business creates on average 3-4 new jobs.

i.e., supply-side effects show up later (and may be driven by those that receive asylum and become refugees). The temporal pattern of supply- vs. demand-side effects has not yet been analyzed in the literature.

We also contribute to the literature on immigrant entrepreneurship. Clark and Drinkwater (2000) show that some immigrant groups are more likely to be self-employed than natives in England and Wales. In particular, time elapsed since immigration, ethnicity and language skills play a role. For the US, Kerr and Kerr (2020) find that 25% of new firms are founded by first-generation immigrants. Kone *et al.* (2021) analyze the likelihood of self-employment for different immigrant groups in the UK and find that refugees stand out among immigrants and have a 6 ppt higher likelihood of being self-employed than UK citizens. In contrast, Brunetti and Zaiceva (2023) show that in Italy immigrants generally have a lower likelihood of self-employment than natives, even though this gap is not significant for immigrants from Asia and Oceania. In an overview article, Desai *et al.* (2021) point out the scarcity of research at the intersection of entrepreneurship and refugee migration.

Finally, the effect of asylum seekers (as a special type of immigrants) on new business registrations is neglected in the literature. Jahn and Steinhardt (2023) estimate a positive effect of the intake of ethnic Germans in the 1990s from Eastern Europe on net business creation in Germany. Altındağ *et al.* (2020) study the effect of Syrian refugees on new firm formation in Turkey over 2011-16, using the historical share of Arabic-speaking people as an instrument and find a positive effect in line with Akgündüz *et al.* (2018). Dustmann and Glitz (2015) show that new firms in Germany play an important role in the absorption of labor supply shocks through immigration. The fact that demand-side effects are not explicitly taken into account makes it, however, likely that total new business formation is underestimated.

## 3 Background

### 3.1 Asylum seeker allocation in Germany

Upon arrival in Germany, asylum seekers are registered in the nearest initial reception center (*Erstaufnahmeeinrichtung*). From there, they are distributed to the federal states based on fixed quotas following the *Königsteiner Schlüssel*.<sup>10</sup> Next, they are allocated to districts within their assigned state by rule-based quotas which determine the share of asylum seekers to be accommodated in a district. Each state uses different variables and formulas to calculate the quotas but typically they are based on district population shares.<sup>11</sup> It is mandatory for all states, districts, and asylum seekers to participate in the allocation process. In theory, this ensures an allocation of asylum seekers orthogonal to other district characteristics. Yet, there is imperfect compliance with the quotas, e.g., due to variation in housing availability.

Asylum seekers cannot choose to live in another state but must stay in the state they were assigned to for three years. This regulation ensures the allocation effect of the *Königsteiner Schlüssel*. With this residence rule, federal states can assign asylum seekers to a place of residence (*positive allocation*) or prohibit moving to certain areas (*negative allocation*). Seven federal states (Baden-Württemberg, Bavaria, Hesse, North Rhine-Westphalia, Saarland, Saxony, Saxony-Anhalt) apply strict positive allocation to their districts since 2016/17.<sup>12</sup> Asylum seekers allocated to the three cities states Berlin, Bremen, and Hamburg are not allowed to live elsewhere. In the remaining six states, refugees are allowed to move to another district within the state. However, Aksoy *et al.* (2023) show that most refugees stay in their initial place of res-

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<sup>10</sup>This scheme calculates state quotas based on tax revenues (2/3) and population size (1/3) (BAMF, 2023). Some regional BAMF offices specialize in specific nationalities and receive disproportionately many asylum seekers from specific countries. Although this might concentrate specific asylum seeker groups in some states, there is no allocation of a single nationality to one specific state (Aksoy *et al.*, 2023).

<sup>11</sup>See Table A.2 in the online appendix for a detailed description of the different allocation quotas per state.

<sup>12</sup>We conduct additional estimations (results available upon request) where we exclude states with strict positive allocation. The baseline effect is significantly positive at the 1% level and even larger than in the baseline.

idence, regardless of whether the state strictly applies positive allocation.<sup>13</sup> This indicates that the *Königsteiner Schlüssel* and within-state allocation quotas strongly determine where asylum seekers live even several years after their arrival in Germany.

## 3.2 Business registrations (in Germany)

### 3.2.1 Determinants of business registrations

Individuals choose self-employment if the utility of entrepreneurship in terms of the profit of the business or self-realization benefits is higher than the utility of the outside option such as current wages (von Greiff, 2009). In addition, individual risk preferences have been shown to play a key role and self-employment has benefits like flexible working hours, freedom, and self-realization that may appeal to some individuals more than to others (Berglann *et al.*, 2011).

Evidence on whether the state of the economy affects business registrations is mixed (Koellinger and Thurik, 2012). The risk of unemployment is high during a recession and therefore push factors of self-employment can be strong. Yet, a recession can also deter individuals from starting a new business. If there is a low likelihood of success, risk-averse individuals might avoid self-employment.<sup>14</sup> Thus, the utility of the outside option increases. A second push factor for self-employment are difficulties on the labor market. If a person is discriminated against or is unable to participate in the regular labor market, e.g., due to illness or caring for a relative, self-employment can be an attractive alternative.

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<sup>13</sup>In a similar vein, Hilbig and Riaz (2022) show that refugees in Germany with and without movement restrictions do not differ much in their propensity to move. Bailey *et al.* (2025) examine Syrian refugees in Germany and leverage their movement across districts to assess the role of social connections for integration success. Yet, among the Syrian Facebook users less than 10% moved to another district. German administrative data reveals that for 2015-2020 about 46% of asylum seekers with refugee status moved across district borders at least once (Weber, 2022). Finally, Jaschke *et al.* (2025) state that only 25% of refugees moved based on survey data.

<sup>14</sup>Deole and Rieger (2022) show that the immigrant-native gap in risk preferences has widened for recent immigration cohorts, especially around the time of the 2015 European refugee crisis.

### 3.2.2 Legal regulations in Germany

Any adult in Germany can register a business (based on principle of *Gewerbefreiheit*, see Art. 12 and 24 of *Grundgesetz*). However, in some sectors a certificate of qualification to exercise the profession is necessary, e.g., a craftsman’s examination. A business can be prohibited if the founder is unreliable, as evidenced e.g., by high tax debts or non-payment of social security contributions, to protect the general public and potential employees (§35 of *Gewerbeordnung*). The notification of approval for a business registration must be received within three days (§15 of *Gewerbeordnung*). According to data by the World Bank (2021) for 2019, it takes on average eight days to set up a business in Germany.

Asylum seekers in Germany are allowed to be self-employed and register a business under specific circumstances. When applying for asylum, they are classified into different protection statuses. The statuses depend on the asylum decision: ongoing, granted (temporary or permanent) or denied. Asylum seekers with an ongoing asylum decision (open protection status) may start a business if they obtain a permission by the responsible government agency. Individuals granted asylum (temporary protection from asylum process) become refugees and are allowed to start a business (see Table A.1 in the online appendix for details).

## 4 Data

### 4.1 Asylum seeker data

We obtain access to a panel dataset across German districts over time from the Federal Statistical Office.<sup>15</sup> The data includes all individuals seeking protection (*Schutzsuchende*). Asylum seekers are foreigners seeking shelter in Germany on humanitarian or political grounds and who are registered at the Central Register of Foreigners.<sup>16</sup> Figure 1 illustrates the annual stock

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<sup>15</sup>Due to the large inflow 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 afterwards (BAMF, 2023).

<sup>16</sup>Asylum seekers have an ongoing (*offener Schutzstatus*), granted (*anerkannter Schutzstatus*), or denied asylum decision status (*abgelehnter Schutzstatus*). A granted asylum decision status is valid for an unlimited (*Nieder-*

of asylum seekers over 2007-2021 as well as how asylum seekers were allocated across districts in 2016 in Germany.

[Figure 1 goes here]

Subfigure 1(a) shows a strong increase in the stock of asylum seekers in Germany since 2015/16. The stock of asylum seekers per 1,000 inhabitants increased from around six to 23 between 2007 and 2021. Subfigure 1(b) focuses on the allocation of asylum seekers in 2016 across German districts and indicates large regional variation. Averaged across our sample period, German districts took in 11.6 asylum seekers per 1,000 inhabitants (in 2016: 17.8) with a maximum value of 130 (see Table A.4 in online appendix).

In addition, we have hand-collected information on within-state allocation quotas by reaching out to the government agencies in charge by email.<sup>17</sup>

## 4.2 Business registration data

We obtain exclusive access to annual data on business registrations and deregistrations for 2007 to 2021 from the *Forschungsdatenzentrum* (FDZ) of the German Federal Statistical Office. Since 1996, a nationally homogenized data collection of business registrations is carried out monthly. The data includes business registrations and deregistrations of all legal entities via the universe of municipal trade registration offices (*Gewerbeämter*) as well as information on the economic sector, number of employees, location, legal form, nationality and gender of

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*lassungserlaubnis*) or a limited period of time such as the temporary protection by asylum (*befristet anerkannter Schutzstatus aus Asylverfahren*). Across our sample period, 17.5% of all people seeking protection in Germany had an open, 69.1% had a granted, and 13.4% had a denied asylum decision status.

<sup>17</sup>We contacted the responsible agencies in all states except Saarland and the city states Hamburg, Berlin, Bremen (covering nine districts) as they do not have an internal allocation scheme. 7/12 federal states replied covering 284/393 districts (72%). We did not receive quotas for the remaining 104 districts and therefore rely on the explanation of the calculation or on fixed quotas stated in legal texts. We conducted additional estimations (results available upon request) where we exclude the subsample of states that provided us with the quotas. The baseline effect is significantly positive at the 1% level and larger than in the baseline.

founder(s) (Destatis, 2020).<sup>18</sup> Registrations are captured through business notifications based on a formal questionnaire at the municipal trade registration office. The business registration data does not include freelancers like medical doctors, artists, lawyers, or architects.<sup>19,20</sup>

For sole proprietorship, the founder's nationality is unambiguous. Business registrations of other legal forms by several founders having different nationalities are less suited for our analysis on who founds the new businesses. We therefore focus on new businesses by single founders making up 91.1% of all new businesses in our dataset. We also examine business registrations by single founders with a non-German nationality or from a top-10 asylum seeker country (Syria, Afghanistan, Iraq, Eritrea, Iran, Somalia, Turkey, Russia, Pakistan, Nigeria).

Figure 2 provides descriptive information on business registrations in Germany. Subfigure 2(a) shows the variation in total new registrations per 1,000 inhabitants per year from 2007 until 2021. Subfigure 2(b) illustrates how the business registrations are distributed across economic sectors. While some sectors hardly play a role (*Mining / agriculture / health / art, private production, extraterritorial / real estate activities*), others are an active area for new businesses (*administration, education / construction / other economic services / trade, catering*).

[Figure 2 goes here]

Averaged across our sample period, German districts have 9 business registrations per 1,000 inhabitants and year (see Table A.4 for summary statistics on all variables).<sup>21</sup> In an average-sized district with 210,000 inhabitants, 1,890 new businesses are registered per year,

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<sup>18</sup>The economic sectors are defined according to the classification of the economic branches edition 2008 (WZ 2008), see Table A.6 for details. Due to privacy protection, the dataset is only available via a special extract done by the FDZ. Access is subject to a fee. Numbers of registrations below three and above zero per district, as well as other values that allow tracking individuals are censored.

<sup>19</sup>According to BFB (2021), 37% of all self-employed persons in Germany in 2021 were freelancers.

<sup>20</sup>Note that the data may overstate registrations: it cannot be determined whether the registration is a declaration of intent or whether a company has become economically active. Günterberg (2012) estimates that 90% of small companies do become economically active in Germany. This limitation is thus not particularly large in our context.

<sup>21</sup>Business registrations by founder gender and by sectors are only available as of 2008.

mostly by men. Most new businesses have a single founder who is German. The new businesses have on average 8.4 employees/1,000 inhabitants, mostly in full-time positions.

### 4.3 Further district-level data

Our analysis is based on a balanced panel of 393 German districts over 2007-2021.<sup>22</sup> We obtain additional demographic, economic, and fiscal data at the district level from the German Federal Statistical Office. These are used for balance tests, to define subsamples, or as controls.

## 5 Empirical model

### 5.1 Regression equation

We estimate the effect of asylum seekers on business registrations as follows:

$$BusinessRegistrations_{i,t} = \alpha + \beta AsylumSeekers_{i,t} + X_{i,t-1} + \lambda_i + \gamma_t + \varepsilon_{i,t}. \quad (1)$$

$BusinessRegistrations_{i,t}$  is the number of business registrations per capita in district  $i$  and year  $t$ .  $AsylumSeekers_{i,t}$  is the number of asylum seekers per capita in district  $i$  and year  $t$ .<sup>23</sup>  $X_{i,t-1}$  is a vector of lagged district-level controls (GDP per capita, population density, business tax multiplier, and number of immigrants per capita). To account for time-invariant district characteristics and year-specific effects, we include district  $\lambda_i$  and year fixed effects  $\gamma_t$ . Standard errors are clustered at the district level.

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<sup>22</sup>In 2023, Germany had 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 Osterode/Harz. In addition, the few district mergers from 2007 to 2023 were taken into account and harmonized accordingly in our dataset. For the business tax multiplier, there is no data for the two districts Brandenburg an der Havel and Potsdam in 2008.

<sup>23</sup>See Figure A.1 in the online appendix for the distribution of asylum seekers and new business registrations.

## 5.2 IV design

### 5.2.1 Instrument and first stage

As mentioned in Section 3.1, the share of asylum seekers is likely endogenous. Unobserved district characteristics may affect both the number of asylum seekers and the number of business registrations. Asylum seekers are often sent where appropriate and sufficient housing is available. Additionally, there is evidence that local political characteristics affect the intake of asylum seekers (Fratesi *et al.*, 2018; Bracco *et al.*, 2018). Anecdotal evidence suggests that some regional governments refuse to fulfill the allocation quota while others agree to accommodate more asylum seekers than required (Lange and Sommerfeld, 2024). Also, imprecise asylum seeker data due to registration failures during the peak of the 2015 refugee crisis may induce classical measurement error in the explanatory variable in some years (BAMF, 2023).

To address endogeneity, we use the rule-based hypothetical allocation of asylum seekers as an instrument (Berbée *et al.*, 2022; Lange and Sommerfeld, 2024). We use these hypothetical allocations as they are orthogonal to the irregularities in the actual allocation of asylum seekers to districts. The instrument is based on pre-determined administrative quotas implemented by the federal states to allocate asylum seekers from initial reception centers to districts. The hypothetical allocation of asylum seekers for district  $i$  in year  $t$  is calculated as follows:

$$ASQuota_{i,t} = \frac{AsylumSeekers_{s,t} \times Share_{i,t}}{Population_{i,t}} \quad (2)$$

We multiply  $AsylumSeekers_{s,t}$  (number of asylum seekers allocated to state  $s$  in year  $t$ ) with  $Share_{i,t}$  (share of asylum seekers allocated to district  $i$  effective in year  $t$ ) and scale this by districts' population size  $Population_{i,t}$ .<sup>24</sup> Using this instrument, the first-stage equation is:

$$AsylumSeekers_{i,t} = \alpha + \beta ASQuota_{i,t} + X_{i,t-1} + \lambda_i + \gamma_t + \varepsilon_{i,t} \quad (3)$$

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<sup>24</sup>The shares for all districts within a state add up to 100.

We thus instrument the actual number of asylum seekers per capita  $AS_{i,t}$  with the number of asylum seekers per capita that a district should have received according to  $ASQuota_{i,t}$ .<sup>25</sup>

### 5.2.2 Sources of instrument variation

At first sight, it may seem that there is no variation in our instrumental variable since  $ASQuota_{i,t}$  is based on the district population share within a state and since it is rescaled in per capita terms. If there were no other determinants,  $ASQuota_{i,t}$  would be identical on a yearly basis across districts within a state. In this section, we decompose the variation in our instrument and examine which factors explain how much of the variation in the instrument (see Figure 3).

[Figure 3 goes here]

Subfigure 3(a) visualizes in separate boxplots the raw variation of the instrument as well as the remaining variation after including state (or district) and year fixed effects. The fourth boxplot uses district and year fixed effects plus district population. While the two-way fixed effects capture some of the variation, adding population reassuringly does not seem to matter. The last two boxplots in Subfigure 3(a) show that the entire remaining variation is within districts. Taken together, there is substantial variation in our instrument that is unrelated to population, even in specifications that include fixed effects.

Next, we examine the origin of this variation. Subfigure 3(b) shows the sources of the within-district variation in the residuals after adjusting for district population as well as district and year fixed effects. The variation stems from federal states with different base years for the population share calculation, i.e., earlier than  $t - 1$ , or from states that do not update their quotas annually (Bavaria, Schleswig-Holstein, Thuringia, Rhineland Palatinate, Bremen, Berlin, Hamburg, Saarland). The broad variation across these states in terms of their characteristics

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<sup>25</sup>Asylum seekers' movement after their initial allocation could potentially affect our estimates. When we test mechanisms in Section 7, we also estimate lagged effects up to  $t + 3$ . As it takes time for asylum seekers to become refugees and as they usually remain immobile for several years thereafter (see Section 3.1), it is thus unlikely that causal estimates even in  $t + 3$  are affected by post-assignment mobility.

indicates that these are random statistical conventions that are path-dependent and that are not related to the economic prosperity of individual states. Additionally, some variation stems from different deduction rules due to initial reception centers (IRCs). Typically, asylum seekers live in an IRC before being allocated to a district. Districts with an IRC have lower quotas depending on the number of asylum seekers they host or they are not part of the allocation mechanism at all.<sup>26</sup> Lastly, part of the variation stems from federal states which include additional district characteristics beyond population shares (Hesse, North-Rhine Westphalia, Brandenburg). Comparing the size of the remaining variation when each of these three factors is controlled for, especially the additional characteristics have some explanatory power.<sup>27</sup>

### 5.2.3 Instrument validity

A key identifying assumption is that the instrument affects business registrations only through its impact on the allocation of asylum seekers (*exclusion restriction*). The allocation of asylum seekers according to pre-determined quotas is a state-level administrative process. Quotas can neither be influenced by local authorities nor by asylum seekers. This excludes potential bias from regional sorting by asylum seekers and deliberate allocation choices of districts. Since the quotas are part of an administrative process, they are typically unknown to the general public. It is thus unlikely that the quotas have an effect on business registrations beyond generating part of the observed variation in the actual allocation of asylum seekers.

In addition, there are plausibly exogenous institutional details included in the quota calculation. For one, population numbers are not updated regularly in some states. Thus, some districts receive a disproportional number of asylum seekers in some years. Also, the presence of an IRC affects the number of asylums seekers these districts receive. IRCs are often for-

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<sup>26</sup>40 districts have an IRC. Table A.3 lists all IRCs as well as the time period in which they were in place.

<sup>27</sup>We do not consider North Rhine-Westphalia for the box plot because the additional criterion is % district/state area which is fixed over time. We show in Table A.10 that excluding these federal states our estimate remains significantly positive and comparable in size to the baseline.

mer military bases or other large compounds. Given the specific history of such places, their location is plausibly orthogonal to local economic conditions (Berbée *et al.*, 2022).

Naturally, concerns about the exogeneity of the instrument remain. First, if the instrument allocates more asylum seekers to more prosperous or fiscally stronger districts, this would create an upward bias in the effect on business registrations. The *Königsteiner Schlüssel* is partly based on tax revenues of federal states (BAMF, 2023). In practice, however, the states' population shares are the main determinant because tax revenues are used for its calculation only after the redistribution of funds between states. Also, the *Königsteiner Schlüssel* is based on data from 2017 and has not been updated for later years in our sample period. Thus, the actual economic conditions of the federal states have little relevance for the allocation of asylum seekers to states (Schmandt *et al.*, 2023). Second, a state's choice of including additional criteria for the quota calculation may be endogenous. We run robustness tests excluding states where this is the case (see Table A.10). Third, in some states additional determinants of the allocation quotas are clearly endogenous, in particular the share of employees subject to payroll taxes used in Brandenburg. Thus, the instrument would be correlated with district-level economic characteristics. We exclude Brandenburg in a robustness test (see Table A.10).

To further support the exogeneity of within-state allocation quotas, we conduct balance tests for observable pre-determined district characteristics. In Table A.5 in the online appendix, we test whether different demographic, economic, fiscal, and political characteristics in  $t - 1$  vary with the instrument. Among the twelve variables only two are significant: vote shares of the SPD and Greens (with opposite signs), indicating that there is no systematic ideological effect. Overall, we find that political, economic, fiscal, and demographic characteristics (beyond district population shares) are not correlated with the hypothetical refugee allocation.

On instrument strength, we find that the quotas strongly determine actual asylum seeker allocation. Figure 4 illustrates the large variation in the allocation of asylum seekers according to the quotas. Subfigure 4(a) shows the distribution of the allocation of asylum seekers per capita according to the quotas between 2007 and 2021. Subfigure 4(b) plots a binned scatterplot for the actual asylum seekers and the instrument, indicating a clear positive relationship.

[Figure 4 goes here]

## 6 Results

### 6.1 OLS results

Table 1 collects results from OLS estimations where we regress business registrations on asylum seekers. Model (1) includes year fixed effects and yields a significantly positive coefficient. Model (2) includes year and district fixed effects. The result is still positive, however statistically insignificant. Model (3) is the most complete model including controls. We find a positive but insignificant relationship between asylum seekers and business registrations.

[Table 1 goes here]

### 6.2 IV results

Given that OLS estimates are likely biased, we next present results from IV estimations. We use the number of asylum seekers per capita according to within-state allocation quotas to instrument the actual allocation of asylum seekers. Table 2 collects the results.

[Table 2 goes here]

Model (1) reports the first-stage result without controls. There is a strong and statistically significant relationship between the instrument and actual asylum seekers. An increase by one asylum seeker per capita according to the quotas increases actual asylum seekers by 0.56. Thus, the instrument is clearly relevant for the actual allocation. Model (2) adds controls to the first stage, confirming the previous estimate with a slightly larger estimate of 0.63.<sup>28</sup>

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<sup>28</sup>The Kleibergen-Paap  $F$ -statistic is significantly different from zero. Recent literature states that the rule of thumb of 10 for  $F$ -statistics is not sufficient to rule out weak instruments (Keane and Neal, 2023; Lee *et al.*, 2022). Therefore, we report the Anderson-Rubin test statistic (Anderson and Rubin, 1949). The confidence set shows whether the second-stage coefficient is likely to be non-zero even if our instrument was weak. The confidence set

Model (3) collects the second-stage results without controls. There is a positive relationship between instrumented asylum seekers and business registrations significant at the 5% level. An increase in asylum seekers per 1,000 inhabitants by one SD of 0.01 increases business registrations/1,000 inhabitants by 0.9. In an average district with 210,000 inhabitants, this amounts to an increase by 189 yearly business registrations. With an average of 1,890 business registrations per year, this is an increase by 10%. Model (4) shows the second-stage result with controls which is significant at the 1% level. The coefficient estimate is smaller than in Model (3). In an average-sized district, this estimate implies that 149 additional businesses are registered (7.9% increase).<sup>29</sup> Overall, the IV results show that an increase in asylum seekers leads to new businesses being registered, while the OLS estimations underestimate the true effect.

## 6.3 Robustness

In this section, we discuss results for several robustness tests which can be broadly classified as alternative model specifications and sample compositions. While we only briefly discuss the results here, the full estimation tables are collected in online appendix Section A.3.

### 6.3.1 Alternative model specifications

We investigate whether our findings are robust to different model specifications (see Table A.9). In Model (1), we estimate the effect of asylum seekers on the log of business registrations (not its level) and find a statistically significant positive effect of 7.1% comparable in size to the baseline. Model (2) estimates the effect on the inverse hyperbolic sine of business registrations which is similar to our baseline result. In Model (3), we report reduced-form estimates using

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for a 95% confidence interval does not include zero. Thus, we cannot reject the significance of our second-stage coefficient. For a graphical presentation of the confidence set, see online appendix Figure A.2.

<sup>29</sup>Due to limitations in our dataset, we cannot say anything about the survival rate of newly registered businesses. In general, 77.6% of all businesses registered in 2015 in Germany were still economically active after one year, 37.1% after five years (IfM Bonn, 2024).

the instrument as independent variable. The effect of the instrument on business registrations per capita is significantly positive and slightly smaller than in the baseline (5.6%).

### 6.3.2 Alternative sample compositions

In Table A.10, we first exclude 2015 and 2016 in Model (1) as these were years with an unusual inflow of asylum seekers. The effect is significant and slightly larger than in the baseline. In Model (2), we exclude 16 big cities (as classified by the Federal Institutes for Research on Building, Urban Affairs and Spatial Development (BBSR)) which only slightly shrinks our estimate. In Models (3) and (4), we address initial reception centers (IRCs). When asylum seekers are allocated to a state, they live in an IRC before being allocated to a district. Districts with an IRC have lower asylum seeker quotas or no quota at all. In the baseline, we set quota values for the five IRC districts with no quota to missing, while in Model (3) we set them to zero.<sup>30</sup> The estimate is slightly smaller than in the baseline. In Model (4), we exclude all 40 IRC districts. The estimate is again slightly smaller than in the baseline. In Model (5), we exclude all states that have no internal allocation scheme (Berlin, Hamburg, Bremen, Saarland). The effect is significantly positive and similar to the baseline. Models (6)-(9) one-by-one exclude states with specific rules on quota calculation: NRW, Hesse, Brandenburg, Baden-Württemberg. The estimates are significantly positive and in most cases comparable in size to the baseline.

## 7 Mechanisms

Our main result that asylum seekers lead to an increase in business registrations can theoretically be due to three different channels: asylum seekers joining the workforce, asylum seekers

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<sup>30</sup>Five out of 40 districts with an IRC have no quota. All other districts have an existing but lower quota. For the five districts Ostalbkreis, Karlsruhe, Heidelberg, Mannheim, and Zollernalbkreis, we have set the number of asylum seekers to missing. While these districts receive asylum seekers mainly due to the IRC, these asylum seekers are new to Germany, only stay for a short period of time and do not have the same impact on business registrations as asylum seekers who have already settled in a district.

raising demand for basic goods/services, or business registrations by asylum seekers. These three channels will be tested in the following section.<sup>31</sup>

## 7.1 Demand vs. supply: economic sectors

To analyze the role of demand- and supply-side effects, we examine in which economic sector the new businesses are registered. In line with Dustmann and Glitz (2015), Olney (2012) and Berbée *et al.* (2022), we distinguish between tradable and non-tradable sectors to disentangle demand- and supply-side effects. Business registrations in sectors producing goods/services that can be consumed anywhere are primarily prone to labor supply shocks. Business registrations in sectors producing non-tradable goods/services have a more local scope and are more likely to respond to increases in demand for these goods/services.

To test how much of the baseline result is due to demand- vs. supply-side effects and how this develops over time, Table 3 conducts the baseline analysis across sectors and distinguishes supply- and demand-side effects for  $t$ ,  $t+1$ ,  $t+2$ , and  $t+3$ .<sup>32</sup> Panel A shows the baseline IV estimate for ten economic sectors which we further divide into tradable (supply) and non-tradable (demand) sectors.<sup>33</sup> The following five sectors are rather tradable and refer to areas where asylum seekers might eventually find employment: *Real Estate Activities* (purchase, sale, rental of land and buildings), *Information, Communication* (publishing industry, software develop-

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<sup>31</sup>In theory, there are also other mechanisms that could play a role. Balkan and Tumen (2016) show that Syrian refugees working informally in Turkey push down wages and substitute informal labor by natives. This in turn creates a decline in consumer prices. Note, however, that this is unlikely to play a large role in the German context where for instance in 2022 informal labor only made up 2.5% in 2022 compared to 28.8% in Turkey (ILO, 2025).

<sup>32</sup>The sectors follow the classification of economic activities 2008 (WZ 2008) of the Federal Statistical Office of Germany, see Table A.6 in the online Appendix for definitions.

<sup>33</sup>Five sectors include activities that are or are not tied to a specific location and can thus not be unambiguously classified as tradable/non-tradable. *Mining* includes mining and quarrying. *Construction* includes building, construction, and civil engineering. *Other economic services* includes rental movable property, temporary agency work, building management. *Trade, catering* includes wholesale, retail, accommodation, catering. *Art, Private Production, Extraterritorial* includes art, entertainment, libraries, sport grounds, production of private households.

ment, data processing), *Freelance & Technical Services* (provision of freelance, scientific, and technical services like legal and tax advice, research and development, translation), *Utilities* (energy, gas supply, water supply, waste disposal and management), *Traffic* (shipping, aviation, and land transportation). The following five sectors are non-tradable and refer to areas where asylum seekers demand basic goods/services: *Administration*, *Education* (public administration, representation of interest groups, education), *Health* (health care, nursing homes, social services), *Agriculture* (products from agriculture, forestry, fishing), *Manufacturing* (manufacturing of nourishment, drinks, furniture), *Finance, Insurance* (provision of financial and leasing services, institutions for finance leasing, pawnshops). Since not all coefficients in Models (1)-(10) are significantly positive, we conclude that new businesses do not emerge in all sectors but concentrate in specific business areas (traffic, health, manufacturing, finance/insurance).

[Table 3 goes here]

Panel B adds up the business registrations across the five tradable and five non-tradable sectors and uses business registrations in these sectors in  $t$  to  $t+3$  as outcomes. As Panel A only considers contemporaneous (i.e., immediate effects), we may overlook that in some business areas it takes longer for a new business to emerge. Models (1)-(3) show that the supply-side effect is insignificant in  $t$  and  $t+1$  and becomes significant in  $t+2$ . This appears reasonable as asylum seekers need to obtain a work permit first (typically being the case once they are granted asylum and become refugees). The coefficient for  $t+2$  is 0.016 (significant at 10% level) and 0.024 in  $t+3$  (significant at 1% level). The demand-side effect is significant in  $t$  to  $t+3$  and varies only slightly in size between 0.013 to 0.015. This shows that the demand-side effect persists even three years after the shock.

## **7.2 Heterogeneity by founder origin**

In the baseline specification, we find that asylum seekers increase business registrations. We now examine the effect of asylum seekers on business registrations with founders of different nationalities in Table 4. We focus on single-founder business registrations covering 91.1%

of the sample.<sup>34</sup> We distinguish between entrepreneurs with German nationality, with foreign nationality (immigrant), and with a nationality of the top-10 asylum seeker countries. Founders from top-10 asylum seeker countries are a subgroup of immigrant founders.

[Table 4 goes here]

Model (1) reruns the baseline estimation with the subsample of single-founder business registrations. The coefficient of size 0.063 (slightly smaller than baseline of 0.071) is positive and statistically significant at the 5% level. Model (2) uses the subsample of businesses with a German single founder. The coefficient of size 0.06 is positive and statistically significant at the 1% level. The estimate for this subgroup is thus very close to the estimate for the full sample in Model (1). Model (3) uses a subsample where at least one founder is an immigrant. The coefficient is statistically insignificant. In Model (4), we estimate the effect of asylum seekers on business registrations by a single founder from a top-10 asylum seeker country. According to the Central Register of Foreigners, the top-10 asylum seeker countries in Germany for 2007-2021 are Syria, Afghanistan, Iraq, Eritrea, Iran, Somalia, Turkey, Russia, Pakistan, Nigeria. A one SD increase in asylum seekers per 1,000 inhabitants increases business registrations for this subsample by 0.03 per 1,000 inhabitants. The coefficient is statistically significant at the 1% level. In an average-sized district, this amounts to 6 additional business registrations (0.4%). Finally, Models (5)-(7) lag the outcome variable by one to three periods and show that the effect grows over time and doubles in  $t+3$ . This likely has to do with the fact that asylum seekers over time have more legal rights for business ownership (e.g., by being granted asylum).

Overall, it appears that some people seeking protection do register their own businesses but this explains only a negligible share of our baseline results. This is noteworthy as studies

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<sup>34</sup>In Table A.7 in the online appendix, we also include the 8.9% of business registrations with more than one founder. We distinguish between business registrations with at least one German founder, at least one immigrant founder, or at least one founder from a top-10 asylum-seeker country. The results are almost identical to Table 4.

for other countries such as the US and the UK show that recent immigrants or refugees are more likely to start a business than natives (Kerr and Kerr, 2020; Kone *et al.*, 2021).<sup>35</sup>

## 8 Extensions

### 8.1 Business deregistrations

Our baseline results show that a higher asylum seeker intake causes an increase in business registrations. However, the effect on the districts' economy could be eliminated if at the same time other businesses are deregistered or moved elsewhere due to more asylum seekers being present. Since our dependent variable only captures new business registrations and not the stock of registered businesses, we conduct additional estimations in which we study the effect of asylum seekers on business deregistrations and net business registrations (registrations - deregistrations). Table 5 shows the IV results with and without control variables.

[Table 5 goes here]

In Model (1), we estimate the effect of instrumented asylum seekers on business deregistrations which turns out to be insignificant. This is also the case for Model (2) where we additionally include controls. We conclude that businesses are not closed down or moved to another district because of the arrival of asylum seekers. Models (3) and (4) reports IV results for the effect on net business registrations without and with controls. The effect is significant in both cases and only slightly smaller than the baseline effect in Table 2, suggesting that while a handful of existing businesses may be replaced, there is overall a sizable positive net effect.

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<sup>35</sup>We also examine whether the effect varies by founder gender. Descriptively, the mean of business registrations by men is 6.7 compared to 2.8 per 1,000 inhabitants by women. Figure A.3 shows that the coefficient for the subsample of business registrations by men is highly significant and positive, while for women it is insignificant. The baseline gender gap thus widens further in districts with higher numbers of asylum seekers.

## **8.2 Job creation in new businesses and beyond**

In this section, we investigate whether the newly registered businesses induced by higher asylum seeker intake create new jobs. First, we limit our analysis to the jobs created within the new businesses. Afterwards, we use official labor statistics by district to investigate whether there are additional job creation effects beyond the newly registered businesses.

### **8.2.1 Job creation in new businesses**

We first estimate the effect of asylum seekers on the number of employees in new businesses. When registering a business, the founder is asked about the number of people working for the new business at the time the business is started. The founder is not included. The information is collected for full-time and part-time positions. This enables us to record the newly created jobs at the start of business. Models (1)-(3) in Table 6 show the IV second-stage results for the total number of employees, full-time employees, and part-time employees.

[Table 6 goes here]

We find a significantly positive effect of asylum seekers on total and full-time employment and no effect on part-time employment. A one SD increase of asylum seekers per 1,000 inhabitants increases the number of employees of new businesses per 1,000 inhabitants by 2.7 (significant at the 1% level). This is exclusively driven by full-time employment in line with the majority of full-time positions of business registrations overall in Table A.4.

### **8.2.2 Job creation overall**

Next, we analyze whether there are employment effects in a district beyond the newly registered businesses. Increases in demand and supply due to a large intake of asylum seekers may first be absorbed by existing businesses. Only when these are not able to deal with the hike in local economic activity, does it become profitable to start a new business. To address this question, we use employment data from the regional database of Germany of the Federal and State Statistical Offices (*Regionaldatenbank Deutschland der Statistischen Ämter des Bundes*

*und der Länder*). The employment data shows the number of employees subject to social security contributions working in a district in 2007 to 2021. We run estimations that are similar to our baseline using employment as our dependent variable. Table 7 reports the results.

[Table 7 goes here]

A one SD increase in asylum seekers/1,000 inhabitants increases the number of people employed/1,000 inhabitants in that district by 10.9. This effect is about four times larger than when considering jobs created by new businesses (2.7) in Table 6. Most jobs are thus created in existing businesses. As in Table 6, this effect is entirely driven by full-time jobs.

We conclude that the surge in local economic activity is mostly absorbed by existing businesses, as evidenced by official employment data. At least part of this effect could also be interpreted differently: setting up new businesses in a district may have compound employment effects that benefit a district more generally. Our data does not allow us to investigate vertical production chains within or across districts to test for this directly but this may be an interesting avenue for future research.<sup>36</sup>

## 9 Conclusion

We analyze the impact of asylum seekers on business registrations across German districts over the 2007-2021 period. To overcome endogeneity, we instrument asylum seekers per capita with within-state allocation quotas. In line with our first hypothesis, we find that an increase in asylum seekers/1,000 inhabitants of one SD ( $\approx 10$  additional asylum seekers) raises business registrations/1,000 inhabitants by 0.7 (7.9% increase). Our baseline result is confirmed by a number of robustness tests.

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<sup>36</sup>In Table A.8, we estimate the effect of asylum seekers on the log difference of GDP over 2007-2021. Model (3) is our preferred model with district and year fixed effects as well as controls. A one SD increase in asylum seekers per 1,000 inhabitants increases the log difference of GDP per 1,000 inhabitants by 0.79%. This is in line with our previous findings suggesting a generally positive effect on the local economy.

Additionally, we can identify mechanisms that drive the baseline results. We find that most new businesses are registered by German single founders. Hence, the positive effect of a larger number of asylum seekers on new business registrations is not driven by asylum seekers starting businesses. A sector-level analysis allows us to analyze the role of supply-side vs. demand-side effects. The demand-side effect materializes in the year of the shock and persists even three years later. On the other hand, the supply-side effect due to asylum seekers finding employment only becomes significant in  $t+2$  and  $t+3$  and grows over time. This is in line with what one would expect based on the minimum time it takes to receive a work permit and is likely driven by those that are granted asylum and have become refugees.

Moreover, we show that asylum seeker intake has positive economic effects overall. A one SD increase in asylum seekers/1,000 inhabitants increases the number of full-time employees of newly registered businesses per 1,000 inhabitants by 2.7. In addition, based on publicly available labor market data by district, we are able to test whether there are labor market effects beyond the new businesses. We find that overall 10.9 additional full-time jobs are created. If we use job creation as a measure of economic absorption of the immigration shock, this suggests that about 25% of the absorption accrues to the new businesses, whereas the bulk of absorption is borne by existing businesses. Simultaneous business deregistrations do not take place.

Our results have important implications for the evaluation of asylum seeker intake in economic terms. The fact that asylum seeker intake leads to a surge in business registrations should be taken into account into these types of evaluations, at least in medium- to long-run projections. With Germany being a country that traditionally has a low self-employment rate, it is possible that in other contexts, effects are larger than in our study. On the other hand, the refugees that arrived in Germany especially as of 2015 were mostly young men being particularly attractive as a source of labor supply.<sup>37</sup> Future research should thus study effects on new businesses in other countries to see whether the effects can be generalized.

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<sup>37</sup>Note, however, that our results are also confirmed when we exclude 2015/16 (see Model (2) in Table A.10).

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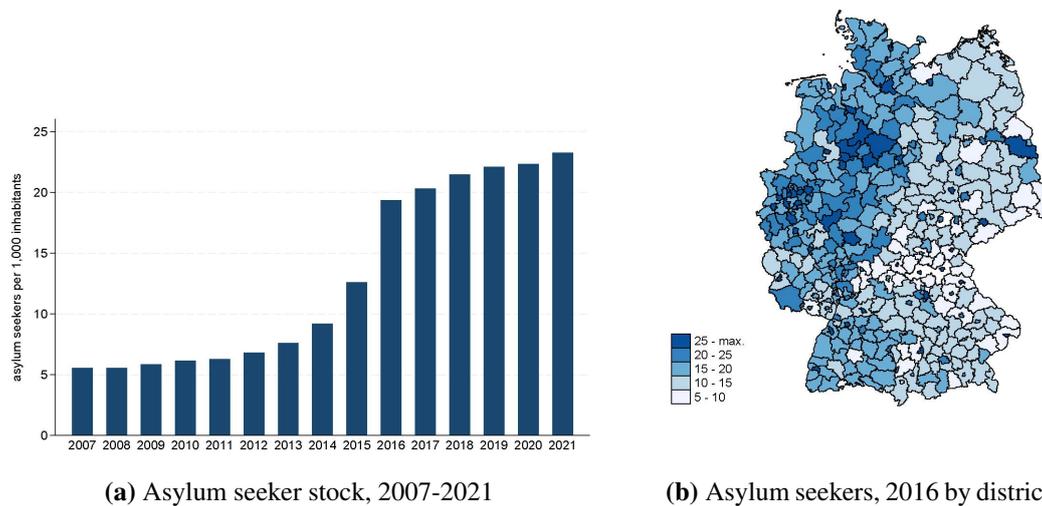
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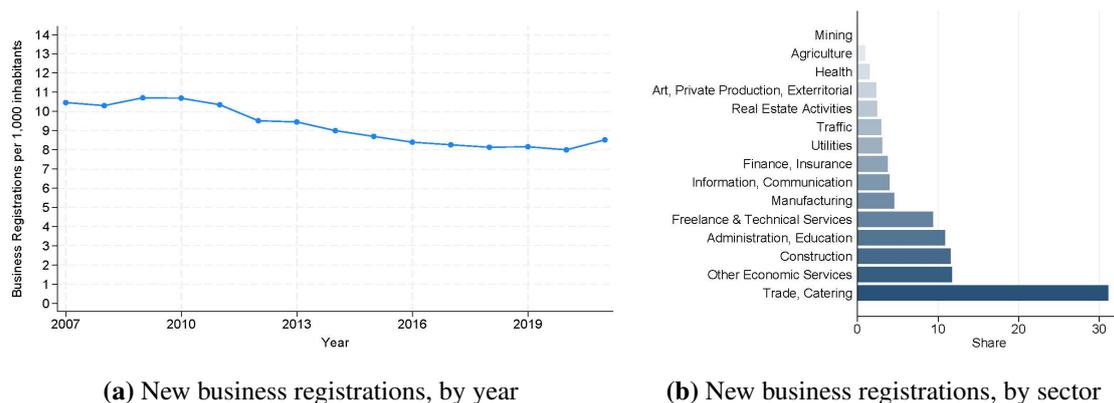
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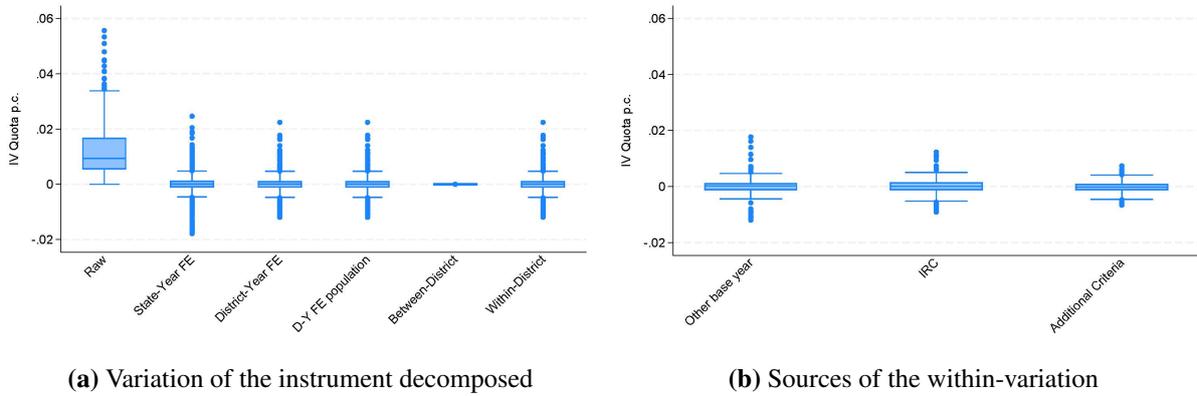
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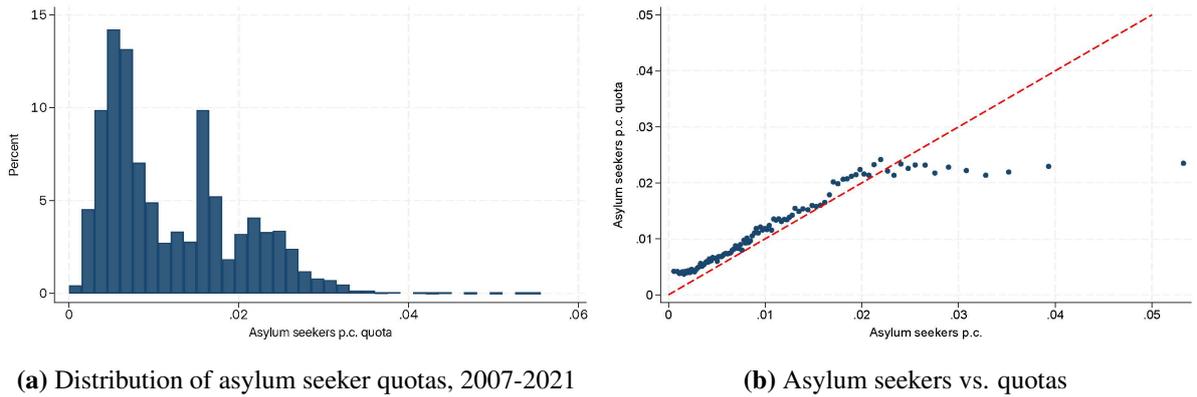
**Figure 1: Asylum seekers in Germany.** Subfigure (a) shows the development in the stock of asylum seekers per 1,000 inhabitants over 2007-2021 in Germany. The 2015 refugee crisis led to a higher stock of asylum seekers persisting at least until 2021. Subfigure (b) shows the actual allocation of asylum seekers to German districts in 2016 which is the first year right after the refugee crisis. The darker the shade of a district, the more asylum seekers were allocated to a district. Numerical values indicate how many new asylum seekers per 1,000 inhabitants arrived in a district.



**Figure 2: New businesses registered over time and across sectors, 2007-2021.** Subfigure (a) shows the evolution of the total number of business registrations per 1,000 inhabitants for Germany from 2007 until 2021. Subfigure (b) shows average shares of business registrations across different economic sectors from 2007 until 2021.



**Figure 3: Variation in the instrumental variable.** In Subfigure (a), we first plot the raw variation of the instrument (allocation of asylum seekers according to within-state allocation quotas) in a boxplot. We then plot the variation of residuals for the following models: First, we regress state and year fixed effects on the instrument. Second, we regress district and year fixed effects on the instrument. Third, we regress district population on the instrument including district and year fixed effects. Fourth, we regress population on the instrument including district and year fixed effects to calculate the within-district variation. Subfigure (b) decomposes the remaining within-district variation from the last boxplot in Subfigure (a) for districts in three types of specificities in allocating asylum seekers across districts. First, we plot within-district variation for districts in federal states that have a different base year for the calculation of population shares or that irregularly update their quotas. Second, we plot the within-district variation for districts that have an initial reception center. Third, we do the same for the within-district variation for districts in federal states that include additional district characteristics to calculate the quotas. The boxes span the interquartile range (25th to 75th percentiles), with the horizontal line marking the median. Whiskers capture the range of the remaining data, while dots represent outliers.



**Figure 4: Instrumental variable: Asylum seekers and rule-based allocation quotas.** Subfigure (a) shows a histogram for the allocation of asylum seekers p.c. according to allocation quotas between 2007 and 2021. Subfigure (b) shows a bincscatter plot of the actual allocation of asylum seekers to German districts vs. asylum seeker allocation quotas for the entire sample period. The data in subfigure (b) is grouped into 100 equally-sized bins.

**Table 1: OLS RESULTS: ASYLUM SEEKERS AND BUSINESS REGISTRATIONS**

|                     | (1)                 | (2)              | (3)              |
|---------------------|---------------------|------------------|------------------|
| Asylum Seekers p.c. | 0.056***<br>(0.013) | 0.002<br>(0.008) | 0.024<br>(0.015) |
| Adjusted $R^2$      | 0.20                | 0.88             | 0.90             |
| Year FE             | ✓                   | ✓                | ✓                |
| District FE         |                     | ✓                | ✓                |
| Controls            |                     |                  | ✓                |
| N                   | 5,895               | 5,895            | 5,500            |

Notes: This table collects results from OLS regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Model (1) includes year fixed effects. Model (2) adds district fixed effects. Model (3) adds lagged controls (GDP per capita, population density, business tax multiplier, and number of immigrants per capita). Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table 2: IV RESULTS: ASYLUM SEEKERS AND BUSINESS REGISTRATIONS**

|                               | First Stage         |                     | Second Stage       |                    |
|-------------------------------|---------------------|---------------------|--------------------|--------------------|
|                               | (1)                 | (2)                 | (3)                | (4)                |
| IV Quota p.c.                 | 0.561***<br>(0.092) | 0.632***<br>(0.076) |                    |                    |
| Asylum Seekers p.c.           |                     |                     | 0.090**<br>(0.044) | 0.071**<br>(0.029) |
| Year FE                       | ✓                   | ✓                   | ✓                  | ✓                  |
| District FE                   | ✓                   | ✓                   | ✓                  | ✓                  |
| Controls                      |                     | ✓                   |                    | ✓                  |
| Kleibergen-Paap Wald F        |                     |                     | 36.85              | 68.58              |
| Anderson-Rubin test statistic |                     |                     | 4.78               | 5.48               |
| AR p-value                    |                     |                     | 0.029              | 0.019              |
| 95% AR confidence set         |                     |                     | [ 0.01, 0.20]      | [ 0.01, 0.13]      |
| N                             | 5,872               | 5,478               | 5,872              | 5,478              |

Notes: This table collects results from IV regressions that relate business registrations per capita to the number of asylum seekers per capita in a district. Control variables are GDP per capita, population density, business tax multiplier, and number of immigrants per capita. Regressions include district and year fixed effects. To account for endogeneity in asylum seeker allocation to German districts, we instrument the number of asylum seekers per capita with the number of asylum seekers according to within-state allocation quotas. In addition to the F-statistic, we report the Anderson-Rubin test statistic to show that the second-stage is non-zero. The t-statistic value needs to be above 3.84 and the AR confidence set should not include zero. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table 3: MECHANISMS: IV RESULTS BY ECONOMIC SECTORS (DEMAND VS. SUPPLY OVER TIME)**

| Panel A                       | Tradable Sectors (Supply)      |                                |                                    |                     |                              |                    |                   |                   |
|-------------------------------|--------------------------------|--------------------------------|------------------------------------|---------------------|------------------------------|--------------------|-------------------|-------------------|
|                               | (1) Real Estate Activities     | (2) Information, Communication | (3) Freelance & Technical Services | (4) Utilities       | (5) Traffic                  |                    |                   |                   |
| Asylum Seekers p.c.           | 0.000<br>(0.001)               | 0.002<br>(0.001)               | 0.003<br>(0.004)                   | -0.003<br>(0.005)   | 0.009***<br>(0.002)          |                    |                   |                   |
| Year FE                       | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            |                    |                   |                   |
| District FE                   | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            |                    |                   |                   |
| N                             | 5,478                          | 5,478                          | 5,478                              | 5,478               | 5,478                        |                    |                   |                   |
| Non-Tradable Sectors (Demand) |                                |                                |                                    |                     |                              |                    |                   |                   |
|                               | (6) Administration & Education | (7) Health                     | (8) Agriculture                    | (9) Manufacturing   | (10) Finance, Insurance      |                    |                   |                   |
| Asylum Seekers p.c.           | -0.007<br>(0.005)              | 0.005**<br>(0.003)             | 0.000<br>(0.001)                   | 0.008***<br>(0.002) | 0.006***<br>(0.002)          |                    |                   |                   |
| Year FE                       | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            |                    |                   |                   |
| District FE                   | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            |                    |                   |                   |
| N                             | 5,478                          | 5,478                          | 5,478                              | 5,478               | 5,478                        |                    |                   |                   |
| Panel B                       | Supply-Side Effect Over Time   |                                |                                    |                     | Demand-Side Effect Over Time |                    |                   |                   |
|                               | (1) BR t                       | (2) BR t+1                     | (3) BR t+2                         | (4) BR t+3          | (5) BR t                     | (6) BR t+1         | (7) BR t+2        | (8) BR t+3        |
| Asylum Seekers p.c.           | 0.011<br>(0.007)               | 0.011<br>(0.008)               | 0.016*<br>(0.009)                  | 0.024***<br>(0.009) | 0.013**<br>(0.006)           | 0.015**<br>(0.007) | 0.013*<br>(0.007) | 0.014*<br>(0.007) |
| Year FE                       | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            | ✓                  | ✓                 | ✓                 |
| District FE                   | ✓                              | ✓                              | ✓                                  | ✓                   | ✓                            | ✓                  | ✓                 | ✓                 |
| N                             | 5,478                          | 5,088                          | 4,698                              | 4,308               | 5,478                        | 5,088              | 4,698             | 4,308             |

Notes: This table collects results from estimating the effect of instrumented asylum seekers on business registrations for different economic sectors. The sectors are divided into five tradable sectors (supply-side effect) and five non-tradable sectors (demand-side effect). Panel A shows the estimation for these ten sectors. Panel B shows the estimation of instrumented asylum seekers on business registrations for economic sectors that indicate supply- and demand-side effects in years t, t+1, t+2, and t+3. We include the following control variables: GDP per capita, population density, business tax multiplier, and number of immigrants per capita. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table 4: MECHANISMS: IV RESULTS BY FOUNDER ORIGIN**

|                        | (1) All single founders | (2) German founder  | (3) Immigrant founder | (4) Top-10 asylum seeker country founder (t) | (5) Top-10 asylum seeker country founder (t+1) | (6) Top-10 asylum seeker country founder (t+2) | (7) Top-10 asylum seeker country founder (t+3) |
|------------------------|-------------------------|---------------------|-----------------------|--|--|--|--|
| Asylum Seekers p.c.    | 0.063**<br>(0.028)      | 0.060***<br>(0.015) | 0.003<br>(0.028)      | 0.003***<br>(0.001)                          | 0.004***<br>(0.001)                            | 0.005***<br>(0.002)                            | 0.006***<br>(0.002)                            |
| Year FE                | ✓                       | ✓                   | ✓                     | ✓  | ✓  | ✓  | ✓  |
| District FE            | ✓                       | ✓                   | ✓                     | ✓  | ✓  | ✓  | ✓  |
| Controls               | ✓                       | ✓                   | ✓                     | ✓  | ✓  | ✓  | ✓  |
| Kleiberger-Paap Wald F | 68.58                   | 68.58               | 68.58                 | 68.58  | 60.56  | 48.15  | 43.82  |
| N                      | 5,478                   | 5,478               | 5,478                 | 5,478  | 5,088  | 4,698  | 4,308  |

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 with different subsamples based on the nationality of founders. Model (1) uses all registrations by single founders, Model (2) by German founders, Model (3) by immigrant founders, and Model (4)-(7) by founders originating from a top-10 asylum seeker country in year t, t+1, t+2, and t+3. Regressions include district and year fixed effects as well as control variables (GDP per capita, population density, business tax multiplier, and number of immigrants per capita). Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table 5: EXTENSION I: ASYLUM SEEKERS AND BUSINESS DEREGISTRATIONS OR NET REGISTRATIONS**

|                        | Deregistrations  |                  | Net Registrations   |                     |
|------------------------|------------------|------------------|---------------------|---------------------|
|                        | (1)              | (2)              | (3)                 | (4)                 |
| Asylum Seekers p.c.    | 0.017<br>(0.033) | 0.004<br>(0.024) | 0.073***<br>(0.018) | 0.067***<br>(0.013) |
| Year FE                | ✓                | ✓                | ✓                   | ✓                   |
| District FE            | ✓                | ✓                | ✓                   | ✓                   |
| Controls               |                  | ✓                |                     | ✓                   |
| Kleibergen-Paap Wald F | 36.85            | 68.58            | 36.85               | 68.58               |
| N                      | 5,872            | 5,478            | 5,872               | 5,478               |

Notes: This table collects second-stage results from IV regressions that relate business deregistrations per capita as well as net business registrations per capita to the number of asylum seekers per capita in a district. We estimate two IV estimations for business deregistrations, one without controls (Model 1) and one with controls (Model 2). Models (3) and (4) use net business registrations without and with controls, respectively. Net business registrations equals business registrations minus deregistrations. The control variables are GDP per capita, population density, business tax multiplier, and number of immigrants per capita. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table 6: EXTENSION II.A: JOB CREATION, NEW BUSINESSES**

|                        | Total               | Full-time           | Part-time        |
|------------------------|---------------------|---------------------|------------------|
|                        | (1)                 | (2)                 | (3)              |
| Asylum Seekers p.c.    | 0.270***<br>(0.087) | 0.235***<br>(0.075) | 0.035<br>(0.032) |
| Year FE                | ✓                   | ✓                   | ✓                |
| District FE            | ✓                   | ✓                   | ✓                |
| Controls               | ✓                   | ✓                   | ✓                |
| Kleibergen-Paap Wald F | 68.58               | 68.58               | 68.58            |
| N                      | 5,478               | 5,478               | 5,478            |

Notes: This table collects second-stage results from IV regressions that relate employees of new businesses registered per capita to the number of asylum seekers per capita in a district. Models (1)-(3) use the number of all employees, full-time employees, and part-time employees within the new businesses. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

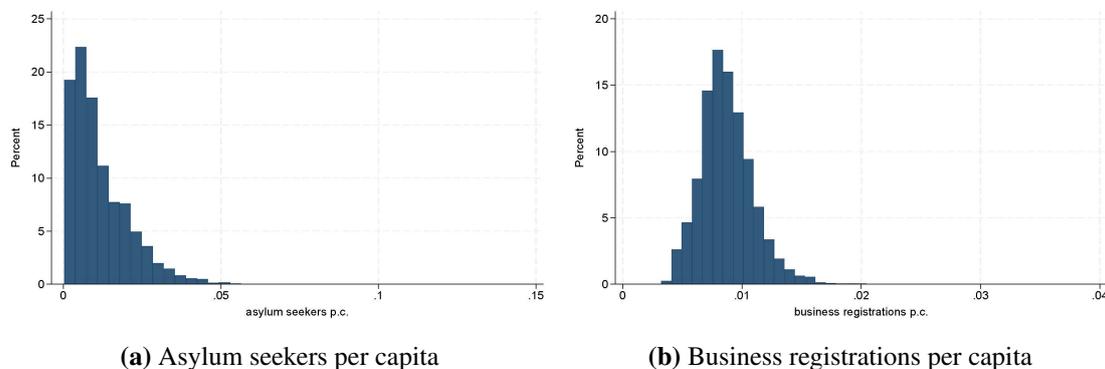
**Table 7: EXTENSION II.B: JOB CREATION OVERALL**

|                     | Total               | Full-time           | Part-time        |
|---------------------|---------------------|---------------------|------------------|
|                     | (1)                 | (2)                 | (3)              |
| Asylum Seekers p.c. | 1.096***<br>(0.339) | 1.085***<br>(0.332) | 0.234<br>(0.159) |
| Year FE             | ✓                   | ✓                   | ✓                |
| District FE         | ✓                   | ✓                   | ✓                |
| Controls            | ✓                   | ✓                   | ✓                |
| N                   | 5,478               | 4,692               | 4,692            |

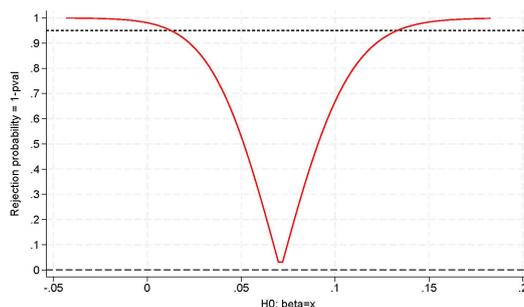
Notes: This table collects second-stage results from IV regressions that relate employees subject to social security contributions per capita to the number of asylum seekers per capita in a district. Models (1)-(3) use the number of all employees, full-time employees, and part-time employees within a district. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

# Online appendix

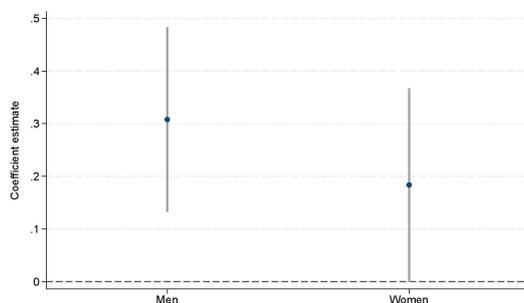
## A.1 Additional figures



**Figure A.1:** Distributions: Asylum seekers and business registrations per capita. This figure shows histograms for (a) asylum seekers and (b) business registrations per capita for all German districts over 2007-2021.



**Figure A.2:** Anderson-Rubin confidence set. This figure shows the Anderson-Rubin confidence set for the baseline in Model (6) in Table 2. The dotted line at the top of the graph shows the 95% threshold. The red line shows the symmetric rejection probability around the baseline coefficient. The baseline coefficient lies at the minimum of the red line. The zero is not included in the 95% confidence set (i.e., the red line and the short-dashed line intersect to the right of the zero). Thus, our coefficient for the second stage cannot be rejected at common significance levels (rejection probability < 0.1).



**Figure A.3:** Asylum seekers and business registrations, by founder gender. The figure shows the estimate for a regression of instrumented asylum seekers p.c. on business registrations p.c. by founder gender. Both variables are standardized. 90% confidence intervals are indicated in the graph.

## A.2 Additional tables

**Table A.1: LEGAL REGULATIONS ON BUSINESS REGISTRATIONS BY ASYLUM SEEKERS**

| Protection status  | Legal paragraph                | Business registration |
|--|--------------------------------|-----------------------|
| open protection status ( <i>offener Schutzstatus</i> )                       | §63a AsylG                     | possible              |
|  | §55 AsylG                      | possible              |
|  | §7 AufenthG                    | possible              |
| temporary protection status from asylum process ( <i>befr. 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 NoAsyl</i> )   | §22 AufenthG                   | yes                   |
|  | §23 Abs. 1 AufenthG            | possible              |
|  | §23 Abs. 2 AufenthG            | yes                   |
|  | §23 Abs. 4 AufenthG            | yes                   |
|  | §24 AufenthG                   | yes                   |
|  | §23a AufenthG                  | yes                   |
|  | §25 Abs. 4 AufenthG            | possible              |
|  | §25 Abs. 5 AufenthG            | yes                   |
|  | §25a AufenthG                  | yes                   |
|  | §25b AufenthG                  | yes                   |
| unlimited protection status ( <i>unbefr. Schutz</i> )                        | §23 Abs. 2 AufenthG            | yes                   |
|  | §26 Abs. 3 AufenthG            | yes                   |
| without protection ( <i>ohne Schutz</i> )                                    | §23 AufenthG                   | no                    |
| tolerated ( <i>geduldet</i> )  | §60a AufenthG                  | possible              |
| latently obliged to leave the country ( <i>geduldet</i> )                    | §50 Abs. 1 AufenthG            | no                    |
| enforceable to leave the country ( <i>vollziehbar</i> )                      | §58 Abs. 2 AufenthG            | no                    |

Notes: This table shows whether individuals are allowed to register a business depending on their protection status (*Schutzstatus*). The first column lists the different types of protection status. The second column states the paragraph in the German residence act relevant for each status. The third column states whether individuals can register a business based on their protection status. *Yes* means that one can become self-employed and register their business at the trade office without any other residence title or permission from the foreigners' authority. *Possible* means that one needs a permission of the foreigners' authority and must apply §21 Abs. 6 AufenthG (German residence act). *No* means that individuals are not allowed to register a business.

**Table A.2:** ALLOCATION RULES BY STATE, CORRESPONDENCE WITH AUTHORITIES, QUOTA DATA USED IN OUR ANALYSIS

| State                             | Allocation based on  | Data from   | Email to  | Reply | Quota data used in our analysis  |
|-----------------------------------|--|-------------|---|-------|--|
| <i>Baden-Wuerttemberg</i>         | % District/state population  | t-1         | Regierungspräsidium Karlsruhe (Referat 92)                                | Yes   | Yrly average of monthly quotas provided (2015-2021), own calculation using district pop shares (2007-2014)     |
| <i>Bavaria</i>                    | % District/state population  | unspecified | Staatsministerium des Innern, für Sport und Integration                   | Yes   | Quotas stated in legal document, 2007-2015 & 2016-2021 (DVAsyl)  |
| <i>Rhineland Palatinate</i>       | % District/state population  | t-2         | Ministerium für Familie, Frauen, Kultur und Integration (Referat 726, 72) | Yes   | Yrly quotas provided (2007-2021)   |
| <i>Saxony</i>                     | % District/state population  | t-1         | Landesdirektion Sachsen (Referat 64)                                      | Yes   | Yrly quotas provided (2010-2021), own calculation using district pop shares (2007-2009)                        |
| <i>Mecklenburg-West Pomerania</i> | % District/state population  | t-1         | Amt für Migration und Flüchtlingsangelegenheiten                          | No    | Own calculation using district pop shares  |
| <i>Lower Saxony</i>               | % District/state population  | unspecified | Ministerium für Inneres und Sport   | No    | Own calculation using district pop shares  |
| <i>Saxony-Anhalt</i>              | % District/state population  | t           | Landesverwaltungsamt Sachsen-Anhalt (Referat Ausländerangelegenheiten)    | No    | Own calculation using district pop shares  |
| <i>Schleswig-Holstein</i>         | % District/state population  | t-1         | Landesamt für Zuwanderung und Flüchtlinge                                 | No    | Quota stated in legal document (2007-2015) (AuslAufnVO), Own calculation using district pop shares (2016-2021) |
| <i>Thuringia</i>                  | % District/state population  | unspecified | Landesverwaltungsamt  | No    | Quotas stated in legal documents, 2007-2011, 2012-2014, & 2015-2021 (ThürFlü-VertVO)                           |
| <i>Brandenburg</i>                | % District/state population, % district/state area, % employees subject to payroll taxes | t-1         | Ministerium für Soziales, Gesundheit, Integration und Verbraucherschutz   | Yes   | Yrly quotas provided (2016-2021), quotas stated in legal documents (2007-2015), 2007-2008 & 2010-2015 (VerV)   |
| <i>Hesse</i>                      | % District/state population, % foreign nationals   | t-1         | Regierungspräsidium Darmstadt (Dezernat II 25)                            | Yes   | Yrly quotas provided (2007-2021)   |
| <i>North Rhine-Westphalia</i>     | % District/state population, % district/state area                                       | unspecified | Bezirksregierung Arnsberg (Dezernat 201)                                  | Yes   | Yrly average of weekly quotas provided (2018-2021), own calculation using district pop shares (2007-2017)      |
| <i>Bremen</i>                     | 80% Bremen, 20% Bremerhaven  | unspecified | —   | —     | Own calculation using fixed shares according to legal document (AufnG)   |
| <i>Berlin</i>                     | Königsteiner Schlüssel   | t-2         | —   | —     | Königsteiner Schlüssel   |
| <i>Hamburg</i>                    | Königsteiner Schlüssel   | t-2         | —   | —     | Königsteiner Schlüssel   |
| <i>Saarland</i>                   | Königsteiner Schlüssel   | t-2         | —   | —     | Königsteiner Schlüssel   |

Notes: This table provides a detailed overview on the information that we retrieved and how we calculated the asylum seeker quotas. The first column refers to each of the 16 federal states. The second column reports the variables that feed into the quota formula per state. The third column states the year from which these variables are retrieved, if stated in official documents. To collect information on the quotas, we contacted the responsible ministries in each federal state responsible for setting the quotas. We did not contact the authorities in Berlin, Hamburg, Bremen, and Saarland because in these states asylum seekers are distributed according to the *Königsteiner Schlüssel* or a fixed quota (80% Bremen, 20% Bremerhaven). In total, we contacted 12 federal states and received a response from seven states. The fourth column specified in detail which authority and if applicable which subdivision we contacted. The fifth column states from which of the states we received a reply. The last column spells out which type of data we received from the authorities and/or how we calculated the quotas ourselves.

**Table A.3: INITIAL RECEPTION CENTERS (IRCs) ACROSS GERMAN STATES AND DISTRICTS**

| Federal states             | Districts with IRC per state | Period      |
|----------------------------|------------------------------|-------------|
| Schleswig-Holstein         | Neumünster                   | 2007 - 2021 |
|                            | Segeberg                     | 2015 - 2021 |
| Lower Saxony               | Braunschweig                 | 2007 - 2021 |
|                            | Osnabrück, Landkreis         | 2014 - 2021 |
|                            | Oldenburg                    | 2019 - 2021 |
|                            | Göttingen                    | 2007 - 2021 |
|                            | Osnabrück                    | 2015 - 2021 |
| Bremen                     | Stadt Bremen                 | 2007 - 2021 |
| North Rhine-Westphalia     | Bielefeld                    | 2011 - 2021 |
|                            | Essen                        | 2016 - 2021 |
|                            | Bonn                         | 2016 - 2021 |
|                            | Mönchengladbach              | 2016 - 2021 |
|                            | Unna                         | 2015 - 2021 |
|                            | Bochum                       | 2017 - 2021 |
|                            | Düsseldorf                   | 2015 - 2021 |
|                            | Dortmund                     | 2011 - 2016 |
| Hesse                      | Gießen                       | 2016 - 2021 |
| Rhineland Palatinate       | Trier                        | 2007 - 2021 |
|                            | Speyer                       | 2019 - 2021 |
| Baden-Württemberg          | Heidelberg                   | 2015 - 2021 |
|                            | Karlsruhe                    | 2007 - 2021 |
|                            | Ostalbkreis                  | 2015 - 2021 |
|                            | Freiburg                     | 2016 - 2021 |
|                            | Sigmaringen                  | 2015 - 2021 |
| Bavaria                    | Deggendorf                   | 2018 - 2021 |
|                            | Regensburg                   | 2017 - 2021 |
|                            | Pfaffenhofen a.d.Ilm         | 2015 - 2021 |
|                            | Fürth                        | 2007 - 2021 |
|                            | Bamberg                      | 2015 - 2021 |
|                            | Schweinfurt                  | 2015 - 2021 |
| Brandenburg                | Oder-Spree                   | 2007 - 2021 |
|                            | Elbe-Elster                  | 2015 - 2021 |
| Mecklenburg-West Pomerania | Schwerin                     | 2007 - 2021 |
|                            | Ludwigslust-Parchim          | 2007 - 2021 |
| Saxony                     | Chemnitz                     | 2007 - 2021 |
|                            | Dresden                      | 2016 - 2021 |
|                            | Leipzig                      | 2016 - 2021 |
| Saxony-Anhalt              | Harz                         | 2007 - 2021 |
| Thuringia                  | Suhl                         | 2007 - 2021 |
|                            | Saale-Holzland-Kreis         | 2015 - 2021 |

Notes: This table shows districts with an initial reception center (IRC) and the time period during which the center was operational. The second column lists per state (see column 1) those districts that have an IRC. The third column shows the years in which the IRC was in operation during our sample period. When calculating within-state allocation quotas, federal states have deduction rules for districts with an IRC. Depending on how many asylum seekers are accommodated in the IRC, the quotas will be reduced. For example, in North-Rhine Westphalia the number of asylum seekers to be allocated to the district will be reduced by 70% of the number of reception places provided. In Hesse, the quota will be reduced by 0.25% for districts with an IRC. Information on the location of IRCs is taken from the respective websites of the federal states and the Federal Office for Migration and Refugees (BAMF). We did not include the city states Berlin and Hamburg as well as the federal state Saarland because they use the the Königsteiner Schlüssel allocation rule which does not include a deduction for IRCs.

**Table A.4: SUMMARY STATISTICS**

| Variable                         | Mean    | Min.    | Max.     | SD     | Obs. |
|----------------------------------|---------|---------|----------|--------|------|
| Business Registrations (BR) p.c. | 0.009   | 0.003   | 0.035    | 0.00   | 5895 |
| Asylum Seekers p.c.              | 0.012   | 0.000   | 0.130    | 0.01   | 5895 |
| Asylum Seekers Quota p.c.        | 0.012   | 0.000   | 0.056    | 0.01   | 5872 |
| GDP p.c.                         | 0.034   | 0.012   | 0.196    | 0.02   | 5895 |
| Business tax multiplier          | 379.218 | 223.000 | 893.000  | 49.52  | 5893 |
| Population density               | 524.328 | 35.339  | 4789.836 | 690.84 | 5895 |
| Foreigners p.c.                  | 0.089   | 0.006   | 0.439    | 0.06   | 5895 |
| Population (in 1000s).           | 208.763 | 33.944  | 3677.472 | 241.55 | 5895 |
| BR Single Founders p.c.          | 0.008   | 0.003   | 0.033    | 0.00   | 5895 |
| BR German p.c.                   | 0.006   | 0.002   | 0.013    | 0.00   | 5895 |
| BR Migrants p.c.                 | 0.002   | 0.000   | 0.026    | 0.00   | 5895 |
| BR Top 10 p.c.                   | 0.000   | 0.000   | 0.002    | 0.00   | 5895 |
| Total Employees BR p.c.          | 0.008   | 0.000   | 0.382    | 0.01   | 5895 |
| Full-Time Employees BR p.c.      | 0.006   | 0.000   | 0.381    | 0.01   | 5895 |
| Part-Time Employees BR p.c.      | 0.003   | 0.000   | 0.299    | 0.00   | 5895 |
| Total Employment p.c.            | 0.368   | 0.139   | 1.048    | 0.12   | 5502 |
| Full-Time Employment p.c.        | 0.270   | 0.101   | 0.837    | 0.09   | 4716 |
| Part-Time Employment p.c.        | 0.096   | 0.030   | 0.283    | 0.04   | 4716 |

Notes: This table reports summary statistics for the outcome variable business registrations per capita, asylum seekers per capita, the instrument asylum seekers according to quotas per capita, gross domestic product per capita, business tax multiplier, population density, number of foreigners per capita, population size in 1,000s, business registrations with a single founder, business registrations with a single German founder per capita, business registrations with a single immigrant founder per capita, business registrations with a single founder coming from the top-10 asylum seeker countries, number of employees from new businesses per capita, number of full-time employees from new businesses per capita, part-time employees from new businesses per capita, number of employees subject to social security contributions in total and subdivided into part-time and full-time employees.

**Table A.5: BALANCE TESTS FOR PRE-DETERMINED DISTRICT CHARACTERISTICS**

| Dep. var.:    | (1) % Foreigners          | (2) % Pop 60+                      | (3) Total employees p.c. | (4) Private sector employees p.c. | (5) Public sector employees p.c. | (6) Log revenues p.c. |
|---------------|---------------------------|------------------------------------|--------------------------|-----------------------------------|----------------------------------|-----------------------|
| AS Quota p.c. | -0.172<br>(0.278)         | -0.018<br>(0.204)                  | 0.240<br>(0.250)         | 0.002<br>(0.221)                  | -0.136<br>(0.133)                | -3.716<br>(3.825)     |
| Year FE       | ✓                         | ✓                                  | ✓                        | ✓                                 | ✓                                | ✓                     |
| District FE   | ✓                         | ✓                                  | ✓                        | ✓                                 | ✓                                | ✓                     |
| N             | 5,872                     | 5,480                              | 5,872                    | 5,872                             | 5,037                            | 2,195                 |
| Dep. var.:    | (7) Log expenditures p.c. | (8) Log business tax revenues p.c. | (9) Vote share CDU       | (10) Vote share SPD               | (11) Vote share Greens           | (12) Vote share FDP   |
| AS Quota p.c. | -0.453<br>(4.005)         | -2.636<br>(1.898)                  | -0.069<br>(0.390)        | 0.825**<br>(0.392)                | -1.836***<br>(0.282)             | -1.773<br>(1.594)     |
| Year FE       | ✓                         | ✓                                  | ✓                        | ✓                                 | ✓                                | ✓                     |
| District FE   | ✓                         | ✓                                  | ✓                        | ✓                                 | ✓                                | ✓                     |
| N             | 2,195                     | 5,871                              | 5,009                    | 5,022                             | 4,861                            | 4,856                 |

Notes: This table collects results from regressing the number of asylum seekers according to within-state allocation quotas on various district characteristics in  $t - 1$ . Models (1) and (2) consider demographic variables: share of foreigners and share of people older than 60 years. Models (3)-(5) consider economic variables: total employees, private sector employees, and public sector employees p.c. in a district. Models (6)-(8) focus on fiscal variables: log revenues p.c., log expenditures p.c., and log business tax revenues p.c. Note that data is only available for 2007-14 for the first two variables. The three fiscal variables are summed over all municipalities in a district. Fiscal data on independent cities was not available. Models (9)-(12) consider political variables: vote shares for CDU, SPD, Greens, and FDP in district council elections between 2007 and 2021. For independent cities, we use the city council election. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors in parentheses. The unit of clustering is the district.

**Table A.6: DEFINITIONS OF ECONOMIC SECTORS**

| <b>Economic Sector</b>                        | <b>Definition</b>   |
|---|---|
| <i>Agriculture</i>                            | Agriculture, forestry, fishing  |
| <i>Mining</i>                                 | Mining and quarrying  |
| <i>Utilities</i>                              | energy and gas supply, water supply, waste disposal, waste management and pollution abatement   |
| <i>Manufacturing</i>                          | Manufacturing of nourishment, drinks, tobacco, textiles, wood, paper, chemical products, plastic, glassware, metal products, cars, furniture  |
| <i>Construction</i>                           | Building construction, civil engineering  |
| <i>Trade, Catering</i>                        | Wholesale, retail, trade with automobiles, accommodation, catering  |
| <i>Traffic</i>                                | shipping, aviation, land transportation, warehousing  |
| <i>Information, Communication</i>             | Publishing, film distribution, cinemas, software development, data processing   |
| <i>Finance, Insurance</i>                     | Provision of financial and leasing services, institutions for finance leasing, pawnshops  |
| <i>Real Estate Activities</i>                 | Purchase, sale, rental of land and buildings  |
| <i>Freelance and Technical Services</i>       | Provision of freelance, scientific and technical services like legal and tax advice, administration and management of companies and businesses, architecture and engineering firms, research and development, advertising and market research, translation, studios for textile, jewelry, graphic, and similar design |
| <i>Other Economic Services</i>                | Provision of other economic services including rental of movable property, temporary agency work, guard & security services, travel agencies, building management, landscaping  |
| <i>Health</i>                                 | Health care, nursing homes, hospitals, and social services  |
| <i>Administration, Education</i>              | Public administration and provision other services including public administration, defense, social security, interest groups, church and other religious associations, education   |
| <i>Art, Private Production, Exterritorial</i> | Art, Entertainment, creative artistic and entertainment activities, libraries, museums, lottery, sports, private households with domestic staff, production of goods, provision of services by private households for own use without a distinct focus, exterritorial organizations                                   |

Notes: This table lists which types of businesses in our dataset belong to which economic sectors. The sector definitions are based on the classification of economic activities 2008 by the Federal Statistical Office of Germany which has created the classification with the intensive involvement of data users and data producers in administration, business, research, and society. The classification takes into account the requirements of the statistical classification of economic activities in the European Community. The European Commission has given its approval in accordance with Article 4, paragraph 3, of the above regulation and is based on the International Standard Industrial Classification of the United Nations (ISIC Rev. 4). We use the high level SAN/ISIC (System of National Accounts/International Standard Industrial Classification of the United Nations) aggregation A\*10/11 (Destatis, 2008).

**Table A.7: MECHANISMS: IV RESULTS BY FOUNDER ORIGIN, BUSINESSES WITH MORE THAN ONE FOUNDER INCLUDED**

|                        | (1) All founders   | (2) $\geq 1$ German founder | (3) $\geq 1$ immigrant founder | (4) $\geq 1$ founder from top-10 asylum seeker country (t) | (5) $\geq 1$ founder from top-10 asylum seeker country (t+1) | (6) $\geq 1$ founder from top-10 asylum seeker country (t+2) | (7) $\geq 1$ founder from top-10 asylum seeker country (t+3) |
|------------------------|--------------------|-----------------------------|--------------------------------|--|--|--|--|
| Asylum Seekers p.c.    | 0.071**<br>(0.029) | 0.062***<br>(0.015)         | 0.007<br>(0.028)               | 0.003***<br>(0.001)  | 0.004***<br>(0.001)  | 0.005***<br>(0.002)  | 0.006***<br>(0.002)  |
| Year FE                | ✓                  | ✓                           | ✓                              | ✓  | ✓  | ✓  | ✓  |
| District FE            | ✓                  | ✓                           | ✓                              | ✓  | ✓  | ✓  | ✓  |
| Controls               | ✓                  | ✓                           | ✓                              | ✓  | ✓  | ✓  | ✓  |
| Kleibergen-Paap Wald F | 68.58              | 68.58                       | 68.58                          | 68.58  | 60.56  | 48.15  | 43.82  |
| N                      | 5,478              | 5,478                       | 5,478                          | 5,478  | 5,088  | 4,698  | 4,308  |

Notes: This table collects second-stage results from IV regressions that relate business registrations per capita by Germans, immigrants, and people from top-10 asylum seeker countries to the number of asylum seekers per capita in a district. Model (1) uses the full sample. Models (2)-(7) use subsamples with at least one German founder, at least one immigrant founder and at least one founder from a top-10 asylum seeker country. Model (4)-(7) uses subsamples with at least one founder from a top-10 asylum seeker country in year t, t+1, t+2, and t+3. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table A.8: IV RESULTS: ASYLUM SEEKERS AND GDP**

|                     | (1)                 | (2)                 | (3)                 |
|---------------------|---------------------|---------------------|---------------------|
| Asylum Seekers p.c. | 0.437***<br>(0.047) | 0.742***<br>(0.286) | 0.786***<br>(0.263) |
| District FE         | ✓                   | ✓                   | ✓                   |
| Year FE             |                     | ✓                   | ✓                   |
| Controls            |                     |                     | ✓                   |
| N                   | 5,480               | 5,480               | 5,478               |

Notes: This table collects second-stage results from IV regressions that relate the log difference of GDP to the number of asylum seekers per capita in a district. Model (1) shows results with district fixed effects, Model (2) adds year fixed effects and Model (3) adds control variables (lagged population density, business tax multipliers, share of foreigners). Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

## A.3 Robustness

**Table A.9: ROBUSTNESS I: ALTERNATIVE MODEL SPECIFICATIONS**

|                     | (1) Log of BR       | (2) IHS of BR      | (3) Reduced form   |
|---------------------|---------------------|--------------------|--------------------|
| Asylum Seekers p.c. | 7.077***<br>(2.344) | 0.071**<br>(0.029) |                    |
| IV Quota p.c.       |                     |                    | 0.045**<br>(0.019) |
| Year FE             | ✓                   | ✓                  | ✓                  |
| District FE         | ✓                   | ✓                  | ✓                  |
| Controls            | ✓                   | ✓                  | ✓                  |
| N                   | 5,478               | 5,478              | 5,478              |

Notes: This table collects second-stage IV results for different model specifications that relate business registrations per capita to the number of asylum seekers per capita in a district. Models (1) and (2) use the log and the inverse hyperbolic sine of business registrations p.c., respectively. Model (3) shows the reduced-form estimation result. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.

**Table A.10: ROBUSTNESS II: ALTERNATIVE SAMPLE COMPOSITIONS**

|                        | (1) w/o 2015/16    | (2) w/o big cities | (3) w/ 5 IRC districts (quota = 0) | (4) w/o 40 IRC districts | (5) w/o BHBS       |
|------------------------|--------------------|--------------------|------------------------------------|--------------------------|--------------------|
| Asylum Seekers p.c.    | 0.082**<br>(0.033) | 0.060**<br>(0.027) | 0.059**<br>(0.027)                 | 0.063**<br>(0.029)       | 0.068**<br>(0.028) |
| Year FE                | ✓                  | ✓                  | ✓                                  | ✓                        | ✓                  |
| District FE            | ✓                  | ✓                  | ✓                                  | ✓                        | ✓                  |
| Controls               | ✓                  | ✓                  | ✓                                  | ✓                        | ✓                  |
| Kleibergen-Paap Wald F | 55.24              | 46.93              | 73.88                              | 105.93                   | 63.29              |
| N                      | 4,699              | 5,255              | 5,500                              | 5,140                    | 5,408              |
|                        | (6) w/o NRW        | (7) w/o HE         | (8) w/o BB                         | (9) w/o BW               |                    |
| Asylum Seekers p.c.    | 0.075**<br>(0.036) | 0.045**<br>(0.020) | 0.071**<br>(0.029)                 | 0.068**<br>(0.028)       |                    |
| Year FE                | ✓                  | ✓                  | ✓                                  | ✓                        |                    |
| District FE            | ✓                  | ✓                  | ✓                                  | ✓                        |                    |
| Controls               | ✓                  | ✓                  | ✓                                  | ✓                        |                    |
| Kleibergen-Paap Wald F | 46.93              | 62.17              | 67.90                              | 72.80                    |                    |
| N                      | 4,736              | 5,128              | 5,242                              | 4,884                    |                    |

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 using different sample compositions. Model (1) excludes 2015/16. Model (2) excludes 16 big cities (classified as metropolitan cities by the Federal Institutes for Research on Building, Urban Affairs and Spatial Development (BBSR)). Model (3) sets the quota values for the 5 IRC districts to zero that have no quota. Model (4) excludes all 40 districts that have an IRC. Model (5) excludes Bremen, Hamburg, Berlin, Saarland. Model (6) excludes North Rhine-Westphalia. Model (7) excludes Hesse. Model (8) excludes Brandenburg. Model (9) excludes Baden-Wuerttemberg. Stars indicate significance levels at 10%(\*), 5%(\*\*), and 1%(\*\*\*). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district.