

Online Appendix: “Asylum Seekers, New Businesses, and Job Creation”

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A.1 Additional figures

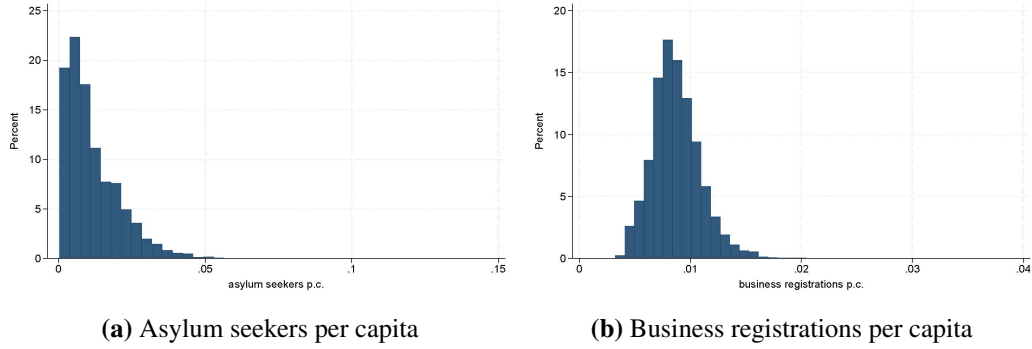


Figure A.1: Distributions: Asylum seekers and business registrations per capita. This figure shows histograms for (a) asylum seekers and (b) business registrations per capita for all German districts over 2007-2021.

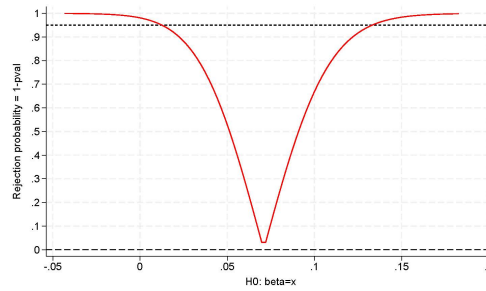


Figure A.2: Anderson-Rubin confidence set. This figure shows the Anderson-Rubin confidence set for the baseline in Model (6) in Table 2. The dotted line at the top of the graph shows the 95% threshold. The red line shows the symmetric rejection probability around the baseline coefficient. The baseline 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).

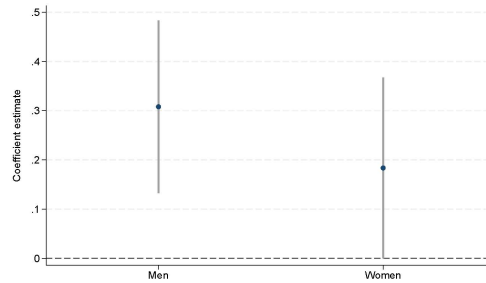


Figure A.3: Asylum seekers and business registrations, by founder gender. The figure shows the estimate for a regression of instrumented asylum seekers p.c. on business registrations p.c. by founder gender. Both variables are standardized. 90% confidence intervals are indicated in the graph.

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 specifies 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 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 (0.278)	-0.018 (0.204)	0.240 (0.250)	0.002 (0.221)	-0.136 (0.133)	-3.716 (3.825)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
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 (4.005)	-2.636 (1.898)	-0.069 (0.390)	0.825** (0.392)	-1.836*** (0.282)	-1.773 (1.594)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
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. Heteroscedasticity- and cluster-robust standard errors in parentheses. The unit of clustering is the district. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A.6: DEFINITIONS OF ECONOMIC SECTORS

Economic Sector	Definition
<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 (e.g., legal or tax advice), administration and management of companies, businesses, architecture/engineering firms, research and development, advertising and market research, translation, studios for textile/jewelry/graphic 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, Extraterritorial</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, extraterritorial 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 > ONE FOUNDER INCLUDED

	(1) All founders	(2) ≥ 1 German founder	(3) ≥ 1 immigrant founder	(4) ≥ 1 founder from top-10 asylum seeker country (t)	(5) ≥ 1 founder from top-10 asylum seeker country (t+1)	(6) ≥ 1 founder from top-10 asylum seeker country (t+2)	(7) ≥ 1 founder from top-10 asylum seeker country (t+3)
Asylum Seekers p.c.	0.071** (0.029)	0.062*** (0.015)	0.007 (0.028)	0.003*** (0.001)	0.004*** (0.001)	0.005*** (0.002)	0.006*** (0.002)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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 by Germans, immigrants, and top-10 asylum seeker country citizens to the number of asylum seekers per capita in a district. Model (1) uses the full sample. Models (2)-(4) use subsamples with at least one founder of German, immigrant, or top-10 asylum seeker country origin. Models (5)-(7) use subsamples with at least one founder from a top-10 asylum seeker country in year $t+1$, $t+2$, and $t+3$. Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

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

	(1)	(2)	(3)
Asylum Seekers p.c.	0.437*** (0.047)	0.742*** (0.286)	0.786*** (0.263)
District FE	Yes	Yes	Yes
Year FE		Yes	Yes
Controls			Yes
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) includes district fixed effects, Model (2) adds year fixed effects, and Model (3) adds control variables (lagged population density, business tax multipliers, share of foreigners). Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

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*** (2.344)	0.071** (0.029)	
IV Quota p.c.			0.045** (0.019)
Year FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
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. Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district. * p < 0.1; ** p < 0.05; *** p < 0.01.

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** (0.033)	0.060** (0.027)	0.059** (0.027)	0.063** (0.029)	0.068** (0.028)
Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
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** (0.036)	0.045** (0.020)	0.071** (0.029)	0.068** (0.028)	
Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
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. Heteroscedasticity- and cluster-robust standard errors are in parentheses. The unit of clustering is the district. * p < 0.1; ** p < 0.05; *** p < 0.01.