

Innovation and Immigration – Insights from a Placement Policy

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Motivation

Currently Western European States are experiencing massive inflows of refugees and immigrants. While anti-immigrant opposition grows, German business leaders and politicians, like Chancellor Angela Merkel, are trying to promote the economic benefits of immigration. **One popular pro-immigration argument used is that immigration can promote economic growth through innovations.** Potential channels are knowledge transfer, technology adoption, capital accumulation and cultural diversity.

Our contribution

Empirical evidence on the effect of immigration on innovation is relatively scarce due to the methodological challenge of endogenous location decisions of immigrants. **Immigrants tend to move to regions offering favorable labor market conditions that are likely to be overly innovative.** Any analysis not properly addressing this endogeneity problem will produce (upward) biased estimates. **We solve the problem of endogeneity by using a quasi-natural experiment of immigration.** We use data from Glitz (2012) and Piopiunik and Ruhose (2015), who collected information about inflows of ethnic German immigrants (Aussiedler) into Germany from 1996 to 2005.

Quasi-natural experiment of immigration

Before and during World War II lots of German citizens migrated to central and Eastern Europe and the former Soviet Union. Many German citizens and their descendants continued to live outside postwar Germany as Eastern Europe countries became increasingly isolated. Due to the political changes in the former Eastern Bloc towards the end of the 1980s, travel restrictions were removed, causing an enormous migration to Germany. Faced with these massive inflows, **the German government allocated arriving ethnic German immigrants to German counties to ensure a relatively even regional distribution of ethnic Germans.** Allocation was based on counties' population and space and the proximity to family members living in Germany. **Thus, the allocation prevented self-selection into regions with high innovation activities.**

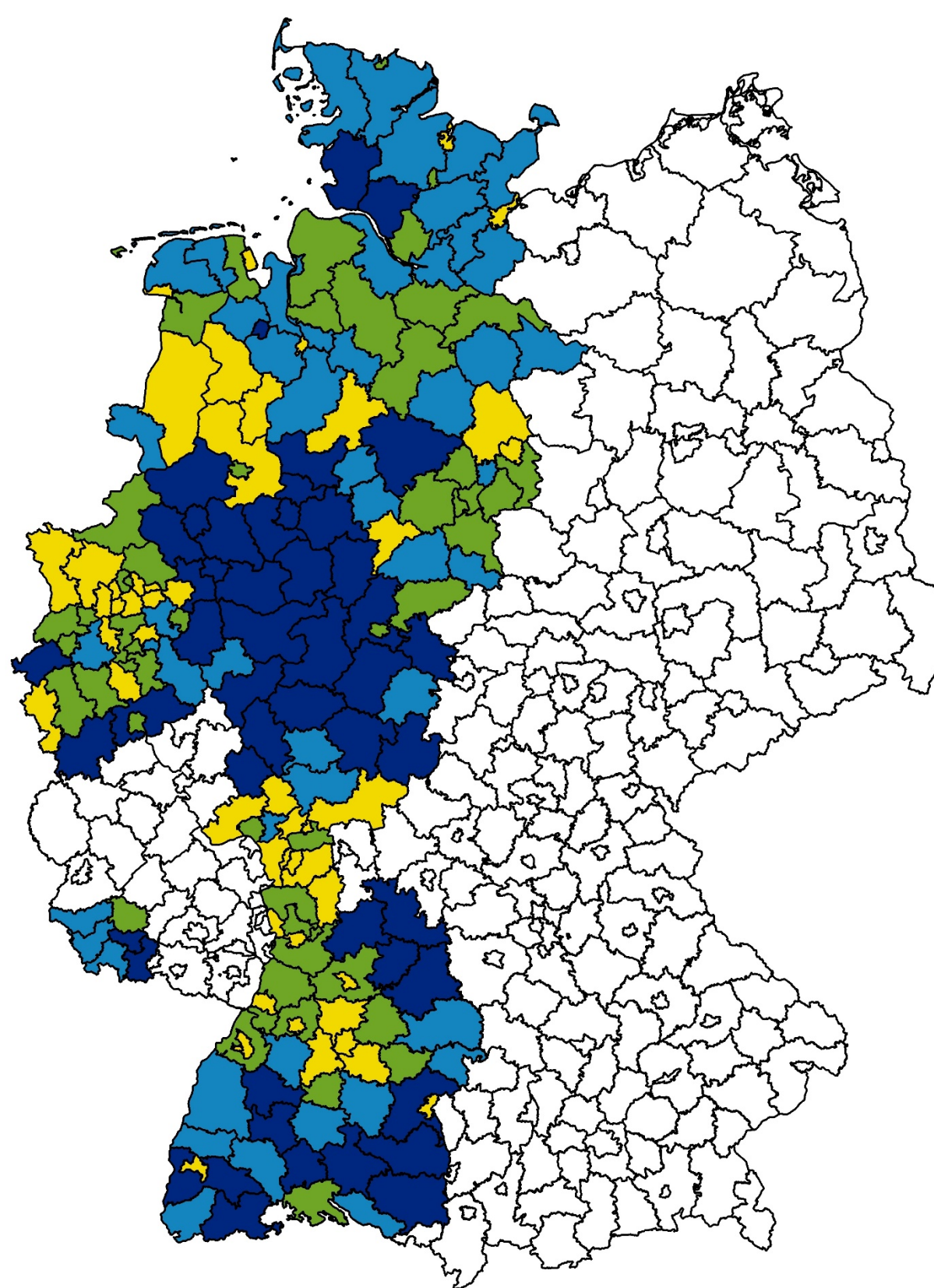
Empirical analysis

To investigate the effect of immigration on innovation, we estimate the following panel model:

$$\text{Number of patent applications}_{rt} = \alpha_0 + \alpha_1 \text{Ethnic German inflow rate}_{rt-1} + \beta X_{rt-1} + I_t + \mu_r + \varepsilon_{rt}$$

with

- *Number of patent applications*_{rt} measuring PCT patent applications in region r in year t (inventors' place of work, fractional count, priority date), calculated from OECD REGPAT database
- *Ethnic German inflow rate*_{rt-1} measuring the number of ethnic German immigrants allocated to region r in year t-1 divided by the population of that region in thousand at the end of year t-2
- *X*_{rt-1} being a vector of control variables for region r in year t-1
- *I*_t being a vector of year fixed effects
- *μ*_r being the region specific component of the error term
- *ε*_{rt} being the idiosyncratic component of the error term



Ethnic German inflow rate, average over 1996-2005

Yellow	> 0.19	≤ 0.90	(48)
Green	> 0.90	≤ 1.15	(47)
Blue	> 1.15	≤ 1.40	(50)
Dark Blue	> 1.40	≤ 2.76	(48)

Note: We focus on West German regions (excluding Berlin) since data on Aussiedler inflows to East German regions are very fragmentary. In Bavaria and Rhineland-Palatinate non-compliance to the allocation was not prosecuted.

Effect of immigration on innovation, 1996-2005

Dependent variable: Number of patent applications_{rt}

Explanatory variables	Coefficients	Standard errors
Ethnic German inflow rate _{rt-1}	1.207*	0.684
Ln population _{rt-1}	125.9***	41.69
Share of foreigners _{rt-1}	-1.465	1.836
GDP per capita _{rt-1}	27.91**	12.38
Unemployment rate _{rt-1}	-2.158**	0.974
High-skilled employment _{rt-1}	15.93***	4.496
GVA primary _{rt-1}	0.0494	0.0826
GVA tertiary _{rt-1}	0.132	0.324
RD _{rt-1}	3.203	13.92
Constant	-803.0***	214.4
Observations	1,553	
Regions	175	
Adj. R-square (within)	0.401	

Standard errors are clustered at the level of regions. *** p<0.01, ** p<0.05, * p<0.1.

Conclusions

Our panel estimates (including robustness checks) indicate that immigration had no or even a positive impact on innovations, although the majority of arriving Aussiedler were unskilled.