Nina Heyden, MSc Applied Economics and Data Analysis '19
The Effect of Immigration on Task Specialisation in Great Britain

   The United Kingdom has consistently been among the top six OECD countries with the highest inflow of immigrants since 2000 and top three from 2009 to 2016, with 454,000 new arrivals in 2016—nearly double the inflow level in 2000 (OECD, 2018). Increasing immigration is often cited among the reasons for the United Kingdom's departure from the European Union (Vargas-Silva, 2016, p. 251). Public concern about immigration stems from the argument that an increase in the foreign-born share of workers who are similar to natives in terms of training can exert pressure on the existing labour supply and depress wages. However, consensus among the literature is that immigration has neither had a substantial effect on native workers' average wages, nor employment (Wadsworth, 2017, p. 1).

   To explain the surprising lack of effects of immigration on natives' labour market outcomes, Peri and Sparber (2009) theorise that less educated native- and foreign-born workers are imperfect substitutes. They propose that native workers have a comparative advantage in communication and cognitive intensive tasks, while foreign-born workers have a comparative advantage in physical and manual intensive tasks. Immigration creates an incentive for natives to transition from occupations intense in physical task supply to those requiring more communication skills. Because communication or cognitive intensive occupations typically pay higher wages, native workers shield themselves from competition and potential decreased wages by specialising in the skills in which they have a comparative linguistic advantage (Peri and Sparber, 2009, p. 136).

   With quarterly data from the UK Labour Force Survey and the US Department of Labor's Occupational Information Network (O*NET) dataset on job task requirements, I employ the theory of imperfect substitutes developed by Peri and Sparber to test the impact of immigration on skill specialisation in Great Britain from 2001 to 2010. I regress regional average communication relative to manual task supply on the share of a region's immigrants along with region and time dummies (Equation (1)). I also separate the effect of immigration on average native-born supply of manual (m_N) and communication (c_N) tasks and estimate equations (2) and (3), producing the weighted least squares (WLS) estimates in Table 1.

   Endogeneity is one of the major empirical challenges of immigration literature (Card, 2001, p. 27). In this case, labour market conditions may influence both immigration and skill supplies. To address the simultaneity issue, I create an instrument from immigration patterns a decade prior to the analysis, which should predict immigration shares without being related to labour market conditions during the timeframe of the analysis.

   The two-stage least squares (2SLS) regressions suggest that native workers indeed supply more communication and less manual tasks in response to immigration. For each 1 percentage point increase in the foreign-born share of less educated workers, less educated native workers boost their relative communication to manual task supply by 0.62 percent (Table 1, column 2). The positive effect of immigration on natives' communication skill supply is robust to various alternative specifications; however, the results are sensitive to the inclusion of region fixed effects. In reality, the change is likely indeed positive, but is probably lower in magnitude, after accounting for variation between regions of Great Britain.

   Thus, the present study contributes evidence that native-born workers adapt their occupational choice according to their comparative advantage to complement the skills of immigrants. The findings are in line with estimates by Börke Tunali, Fidrmuc, and Campos (2017) that from the 2004 EU expansion onward, immigration from A-8 accession countries has generated wage growth among low-skilled UK native workers (p. 7). The present study confirms an interesting vehicle for labour market flexibility—at the individual level—and opens avenues for future research to explore the mechanisms by which natives "upskill" and how policy may be used to harness complementary strengths of workers in the UK and other countries.

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Equations 1-3. Empirical Specifications

$$(1) \quad \ln\left(\frac{C_N}{M_N}\right)_{rq} = \alpha_N \, f_{rq} + \rho_r^N + \tau_q^N + \varepsilon_{rq}^N$$

$$(2) \quad \ln(c_N)_{rq} = \alpha_N^C \, f_{rq} + \rho_r^C + \tau_q^C + \varepsilon_{rq}^C$$

$$(3) \quad \ln(m_N)_{rq} = \alpha_N^M \, f_{rq} + \rho_r^M + \tau_q^M + \varepsilon_{rq}^M$$

Notes: To construct the average communication (c_N) and manual (m_N) skill supply by native workers (N) in a region (r) and quarter (q), I first run regressions to control for individual age, education, gender, and ethnicity. c_N and m_N denote this "cleaned" supply and C_N / M_N is their ratio. f_{rq} is the share of foreign-born employees in a region and quarter, ρ^N represents region fixed effects which account for local labour demand, τ^N represents time fixed effects which control for technological patterns, and ε^N represents a disturbance term.

Table 1. The impact of foreign-born workers on natives' supply of tasks
(Workers with a secondary education or less)

Specification		(1)	(2)	(3)	(4)
Method of estimation		WLS	2SLS	WLS	2SLS
Explanatory variable		Foreign-born share of workers	Foreign-born share of workers	Foreign-born share of workers	Foreign-born share of workers
Quarter fixed effects		✓	✓	✓	✓
Region fixed effects		✗	✗	✓	✓
Dependent variable					
$\ln\left(\frac{C_N}{M_N}\right)$	α_N	0.50***	0.62***	-0.04	-0.48***
		(0.05)	(0.19)	(0.05)	(0.16)
$\ln(c_N)$	α_N^C	0.17***	0.21***	-0.01	-0.14***
		(0.01)	(0.06)	(0.02)	(0.04)
$\ln(m_N)$	α_N^M	-0.33***	-0.41***	0.03	0.34***
		(0.04)	(0.13)	(0.04)	(0.12)
First stage					
***F*-test of the instrument**		NA	21.00	NA	15.82
(p-value)			(0.00)		(0.00)
Observations		429	429	429	429

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Notes: Separate regressions yield the estimates for each cell. Standard errors are reported in parentheses unless otherwise noted. To construct the average manual (m_N) and communication (c_N) skill supply by native workers in a region and quarter, I first run regressions to control for individual age, education, gender, and ethnicity. c_N and m_N denote this "cleaned" supply and C_N / M_N is their ratio. The number of observations correspond to the 11 government office regions of Great Britain over each quarter from Q2 of 2001 to Q4 of 2010. Employment serves as the weight for each observation and the standard errors are heteroscedasticity-robust and clustered by region.

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