

# Workplace segregation and the labour market performance of immigrants\*

Sébastien Willis<sup>†</sup>

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## Abstract

Immigrants are more likely to have conationals as colleagues, however the consequences of such workplace segregation is an open question. I study the effect of the conational share in an immigrant's first job on subsequent labour market outcomes using register data from Germany. I instrument for the conational share using hiring trends in the local labour market and find that a ten percentage-point increase in the initial conational share lowers employment rates by 3.3 percentage points six or more years after the start of the first job, an effect not observed for non-conational immigrants, with no effect on wages conditional on employment. The employment effect appears to be explained by differences in the quality of social network and subsequent job search behaviour induced by differences in the initial workplace, although differential Germany-specific human capital acquisition cannot be entirely ruled out.

**Keywords:** Employment, segregation, coworker networks, immigrant earnings dynamics

**JEL codes:** J61, J64, J31

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<sup>†</sup>Department of Economics, Uppsala University. [sebastien.willis@nek.uu.se](mailto:sebastien.willis@nek.uu.se)

# 1 Introduction

A growing body of evidence has documented substantial segregation across workplaces by country of origin in developed economies (Andersson et al., 2014; Åslund and Skans, 2010; Glitz, 2014; Hellerstein and Neumark, 2008). Not only do immigrants tend to be segregated from natives, they also tend to be segregated from other immigrant groups. However, evidence on whether workplace segregation might contribute to persistent wage and employment gaps between immigrants and natives (documented in Borjas, 1985; Chiswick, 1978; Lubotsky, 2007; Sarvimäki, 2011) is more scarce.

Previous work has shown that more segregated groups have worse labour market outcomes on average (Åslund and Skans, 2010; Glitz, 2014) and that higher conational shares in the first job are negatively associated with individual outcomes (Ansala et al., 2021). However, assessing the causal effect of the initial conational share is more difficult. Immigrants likely differentially select into first jobs with a higher or lower conational share based on unobserved characteristics related to future employability. Furthermore, the initial conational share is likely to be associated with other characteristics of the first job which might affect wages in that job, such as the presence of an immigrant manager (Åslund et al., 2014) or having received a referral (Dustmann et al., 2016). The true causal effect of the conational share is therefore not identified by simple comparisons of immigrants who start in high- or low-conational share firms.

In this paper, I set out to estimate the causal effect of the conational share in the first job an immigrant holds in Germany on subsequent labour market outcomes. To address the identification problem, I propose to instrument for the initial conational share using predicted hiring in the location and year where an immigrant is searching for a job. Specifically, for a given immigrant, I calculate the expected share of conationals if the immigrant were randomly assigned a different job in their district that was filled by another immigrant in the same year. Conditional on fixed effects that interact labour market, district, nationality, and year of arrival, capturing the information available to immigrants when choosing where to search for a job, I provide evidence that the predicted conational share is quasi-randomly assigned. Furthermore, to satisfy the exclusion restriction, I include a set of other firm characteristics in the regression specifications, and instrument for these using a set of predicted firm characteristics constructed using the same method as the predicted conational share.

Implementing this empirical approach on a sample constructed from the German Sample of Integrated Employer-Employee Data (SIEED), I find that starting out in a firm with a higher conational share has a negative effect on an immigrant’s probability of being employed in the longer term. A ten-percentage-point increase in the initial conational share reduces employment rates by 2 percentage points after two years, rising to 3.3 percentage points after six or more years. Importantly, the long-term employment effect is specific to the conational share and does not exist for immigrants who do not share the immigrant’s nationality, suggesting that the underlying mechanism must be specific to the conational share. The estimates are robust to selective return migration, and survey evidence from the German Socio-Economic Panel (SOEP) suggests the effect is not due to an increase in self-employment. In contrast, there is no evidence

of a wage effect for the conational share, while the share of other migrants has, if anything, a positive effect on wages in the long-term.

Having established that the initial conational share has a negative longer-term effect on employment rates, I then review the evidence for different mechanisms that might explain this finding. The effect does not appear to be due to differences in productivity or wages in the first job, which might propagate to subsequent jobs via job-ladder effects (Burdett and Mortensen, 1998). Rather, a higher initial conational share worsens an immigrant’s ability to search for jobs in the longer term. Immigrants with a higher initial conational share are more likely to transition from their first job into unemployment rather than another job and, conditional on becoming unemployed, they tend to stay unemployed for longer. Again, these effects are not observed for the share of immigrants from other countries of origin. I interpret these effects as evidence that a higher initial conational share makes an immigrants coworkers a worse source of information and referrals in the future. However, I cannot entirely rule out that a higher initial conational may also reduce the accumulation of host-country specific human capital in the first job, reducing immigrants’ productivity in the longer run.

The focus in this paper on the set of coworkers in the first job fits in a tradition of economists studying how the initial conditions upon an immigrant’s arrival affect an immigrant’s career path. Typically, prior research has focused on the initial place of residence and the relationship between the size of an immigrant’s ethnic group in the initial location of residence and the immigrant’s subsequent labour market outcomes (Battisti et al., 2018; Beaman, 2012; Damm, 2009; Edin et al., 2003; Munshi, 2003). The switch of focus, to the initial place of work and composition of the set of coworkers, is novel. It is motivated by recent evidence that coworker networks are a more important determinant of an individual’s labour market outcomes than residential networks (Eliason et al., 2019). It also builds on evidence that an immigrant’s firm identity accounts for as much as 40 per cent of the immigrant-native wage gap (Aydemir and Skuterud, 2008; Barth et al., 2012), mirroring the more general finding that firm identity explains a substantial portion of workers’ wages and wage inequality (Abowd et al., 1999; Card et al., 2013, 2018; Song et al., 2019).<sup>1</sup> In this case, I study whether a particular time-varying characteristic of the initial firm, namely the conational share at the time of first employment, has persistent long-term effects on an immigrant’s labour market outcomes.

The results presented here necessarily condition on an immigrant having found a first job. Nevertheless, they contribute to our understanding of immigrants’ labour market integration more broadly (see, e.g., Algan et al., 2010; Borjas, 1985; Chiswick, 1978; Dustmann and Görlach, 2015). In particular, the finding that a higher conational share lowers subsequent employment rates can help us understand the dynamic tradeoff that has been documented between a higher conational share in the location of residence on immigrant earnings, with large ethnic residential networks increasing earnings in the short-term but not in the long-term (Battisti et al., 2018). While a higher residential conational share may speed up job finding (e.g. Edin et al., 2003), I provide descriptive evidence, drawing on the SOEP, that immigrants who find work quicker do so

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<sup>1</sup>Though Bonhomme et al. (2020) have recently argued that the contribution of firms to wage inequality is less than previously thought.

in firms with a higher share of conational coworkers. This will act as a drag on their longer-term labour market performance and will afford immigrants who take longer to find work in a firm with fewer conationals a chance to catch up.

The paper proceeds as follows. In the following section I discuss the data used in the paper. In Section 3 I describe my empirical approach and challenges to identification. In Section 4 I present evidence on the association between initial workplace composition and subsequent employment rates and wages. In Section 5 I assess different possible mechanisms that could explain my result and relate my findings to the existing literature. Finally, Section 6 concludes.

## 2 Data

In the main analysis I use the Sample of Integrated Employer-Employee Data (SIEED), provided by the Institute for Employment Research (IAB) of the German Federal Employment Agency, which is described in detail in Schmidtlein et al. (2020). The SIEED is constructed by first taking a 1.5 per cent sample of all firms making social security contributions during the period 1975–2018.<sup>2</sup> Second, the full employment biographies of all individuals ever employed by the sampled firms are then included in the dataset. I focus on immigrants whose first job was in one of the SIEED firms sampled at the first stage, for whom I observe the full set of coworkers in the first job, who were aged 15–64 at the time of this job, and who first appear in my dataset on or after 1 January 1991.<sup>3</sup> The administrative data only contains information on nationality, not migration status. Until a reform of the German nationality law in 2000, second-generation migrants frequently did not have German nationality. As a result, to avoid misidentifying immigrants, I exclude the major guest-worker countries, Turkey, Italy, and Greece from my sample, as the children of guest workers would be entering the labour market during my sample period. I also exclude individuals who ever report a foreign place of residence, to exclude commuters. The final sample includes around 67,000 individuals.

The employment biographies derived from the social security data only include employment in a job covered by the social security system. This means that work in self-employment or as a civil servant is not covered; breaks in employment biographies could therefore be indicative of unemployment, return migration, or employment in one of these categories. The data are reported as notifications, which record employment spells to the day. I transform the daily data into an annual panel, starting from the immigrant’s first year of social security-covered employment. In particular, I record the fraction of days worked in the calendar year, which I refer to as an individual employment rate, as well as the average daily wage earned in the course of the year, conditional on being employed at least one day. Firm-level variables are either calculated on 30 June, or on the day an individual started working in a firm, where relevant.

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<sup>2</sup>Formally, the SIEED samples establishments; an establishment corresponds to all production sites of a single employer in the same municipality operating in the same narrowly defined industry class. I follow convention when working with IAB data in referring to an establishment as a firm.

<sup>3</sup>The IAB data only cover East Germany from this date. I also exclude individuals who first appear in the dataset in East Germany on 1 January 1991, since these individuals were likely already working.

I report descriptive statistics in Table 1. All wage and earnings variables are deflated to 2010 values. Panel A presents time-varying statistics. The average employment rate in my sample, at 0.48, is lower than in the foreign born population as a whole, where it ranged between 0.66 and 0.69 during 2010–2018 (OECD, 2020). This reflects the fact that self-employment and return migration are not observed in the register data; individuals falling into either category are classified as unemployed. I will therefore present results that exclude individuals who drop out of employment permanently as a robustness check. Panel B presents time-invariant characteristics before the start of the first job. The sample contains a greater share of males than the immigrant population as a whole, reflecting the fact that labour force participation is higher among male immigrants than among female immigrants, while the educational distribution in the sample is similar to the that in the wider immigrant population (OECD, 2020). Panel C presents characteristics of the first job or the firm where the first job is obtained. The first firm is on average large, with over 500 employees, however the distribution is highly skewed, and the median firm size is 67. Immigrants earn less on average in the first job (44 euros) than the median in the firm (62 euros).

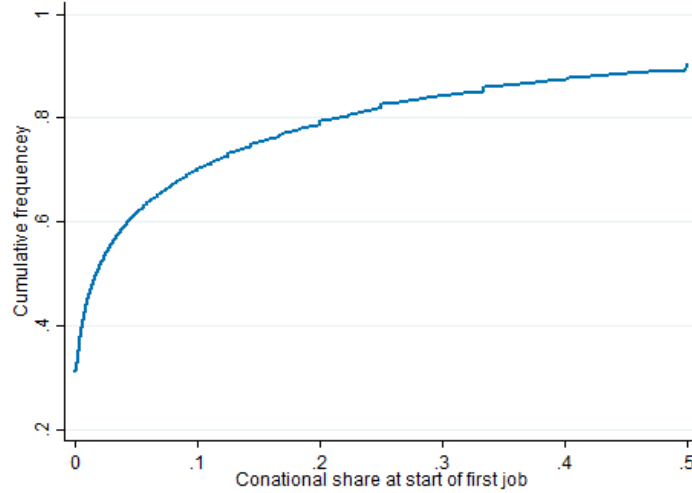
The average conational share in the first firm is 13 per cent and the average share of immigrants from other countries of origin is 25 per cent. In Figure 1 I further plot the cumulative distribution of the conational share in the first job, truncating the distribution at a conational share of 50 per cent. Just over 30 per cent of the sample do not have any conational coworkers in their first job, while around 10 per cent start in a workplace where the majority of their coworkers are conationals. Finally, I report the distribution of countries of origin in Table A.1. The largest groups of immigrants are from new members of the EU, with a quarter of the sample coming from Poland and Rumania, with the next-largest group from the former Yugoslavia, making up around 14 per cent of the sample.

Table 1: Summary statistics

	Mean	SIEED St. dev.	N
Panel A			
Employment rate	0.48	0.45	760269
Annual wage earnings	11264.6	15640.8	760269
Avg. daily wage	58.9	47.8	479221
$\mathbf{1}(t \in [0, 2])$	0.26	0.44	760269
$\mathbf{1}(t \in [3, 5])$	0.19	0.39	760269
$\mathbf{1}(t \geq 6)$	0.56	0.50	760269
Panel B			
Woman	0.41	0.49	67236
Low education	0.61	0.49	67236
Medium Education	0.16	0.37	67236
High education	0.22	0.42	67236
Age at first emp.	30.01	9.54	67236
Panel C			
Conat. share	0.13	0.24	67236
Other mig. share	0.25	0.23	67236
Daily wage	44.2	37.8	67236
Apprentice	0.058	0.23	67236
Part-time	0.37	0.48	67236
Firm size	583.5	1875.7	67236
Median firm size	67	—	67236
Firm median wage	62.2	34.0	67236
Firm age	14.4	11.2	67236
Conat. manager	0.076	0.26	67236
Other mig. manager	0.14	0.35	67236

*Note:* Panel A reports time-varying summary statistics for the years since the first job, average earnings are conditional on being employed on June 30. Panel B reports summary statistics on pre-migration characteristics. Panel C reports summary statistics on the characteristics of the first job held after migration and the firm where the job was held. Wages and earnings are deflated and reported in 2010 Euros.

Figure 1: CDF of conational share in first job



*Notes:* Empirical CDF of the initial conational share in the first job held by an immigrant in my sample. The distribution is truncated at 50, for ease of representation.

In addition to the register data contained in the SIEED, I complement my analyses at certain points with survey data contained in the IAB-SOEP Migration Sample and linked to the social security data of the Institute for Employment Research (officially, the IAB-SOEP-MIG-ADIAB), which is described in detail in Brücker et al. (2013). The IAB-SOEP Migration Sample is an annual survey of individuals in Germany with a migration background (i.e. immigrants or descendants of immigrants), conducted as a supplement to the German Socio-Economic Panel (SOEP). Summary statistics on the 863 individuals in the linked IAB-SOEP data I use in supplementary analyses, who were born in a foreign country with a foreign nationality and who arrived in Germany between the ages of 15 and 64, are contained in Table A.2, while the distribution of the initial conational share in the IAB-SOEP is in Figure A.1 and the distribution of nationalities is in Table A.3.

### 3 Empirical approach

#### 3.1 Overview

To estimate the effect of the initial conational coworker share on immigrants' subsequent labour market outcomes, I model outcomes of interest  $t$  years after the start of  $i$ 's first job,  $Y_{it}$ , as a function of the initial conational share  $s_i^{own}$ . In general, the outcome can be assumed to follow some nonparametric time trend,  $f_2(t)$ , and the effect of interest,  $f_1(t)$ , likewise may be non-constant over time. Furthermore, other time-varying and invariant individual factors  $X_{it}$  may affect the outcome of interest. Finally, more aggregate fixed characteristics, such as cohort effects, if the "quality" of immigrant is changing over time, nationality, or location of arrival within Germany, measured as fixed effects  $\delta_j$  may affect the outcome. Putting it all together,

we have

$$Y_{it} = f_1(t) \times s_i^{own} + f_2(t) + \Gamma X_{it} + \sum_j \delta_j + \epsilon_{it}. \quad (1)$$

To make the estimation problem more tractable, I adopt a semi-flexible approach to modelling the functions  $f_1(t)$  and  $f_2(t)$ . Ideally, I would like to model each as a set of indicator variables for all values that  $t$  takes on. However, I would then have insufficient power to identify the large set of effects of interest. I therefore group years together and instead model both functions as a set of indicator variables for being within 0-2 years of the first job, 3-5 years of the first job, or more than 6 years of the first job. Within the set of control variables  $X_{it}$ , I will pay special attention to the share of immigrants from other countries of origin in the first job,  $s_i^{other}$ , whose effect I will allow to vary over time, just as the effect of the conational share does. The initial share of other immigrants is of special interest, as compared to other characteristics of the firm where the first job is held. A large part of immigrant segregation is due to the excess tendency of immigrants to work with their conationals specifically. It is therefore important to understand whether the effect of exposure to conationals is different to the effect of exposure to immigrants in general. The final estimating equation is thus

$$Y_{it} = \sum_{g \in \{own, other\}} s_i^g \times \mathbf{1}(t \in [0, 2]) + s_i^g \times \mathbf{1}(t \in [3, 5]) + s_i^g \times \mathbf{1}(t \geq 6) + \mathbf{1}(t \in [0, 2]) + \mathbf{1}(t \in [3, 5]) + \mathbf{1}(t \geq 6) + \Gamma X_{it} + \sum_j \delta_j + \epsilon_{it}. \quad (2)$$

In all cases, the set of control variables will include basic demographic characteristics, gender and a quadratic in age, and pre-employment characteristics, educational attainment at the start of the first job and age at the start of the first job. The main threat to identifying the true causal effect of the initial conational share on subsequent outcomes is the possibility that some elements of  $X_{it}$  might be unobserved. In particular,  $X_{it}$  should include all factors that (i) are pre-determined with respect to the initial conational share; and (ii) affect both the initial conational share and subsequent outcomes of interest. Some possible examples of hard-to-observe factors include individual preferences, such as a taste for working with conationals, or fixed individual characteristics, such as employability in Germany.  $X_{it}$  would also need to include any individual characteristics that only indirectly affect the conational share that also directly affect subsequent outcomes. For example, the conational share might be a proxy for having found a job through one's network (c.f. Dustmann et al., 2016); if less productive individuals are more likely to search for jobs through their network, this will also lead to endogeneity bias.

### 3.2 Identification

Given the limited information contained in the SIEED on, for example, the pre-migration characteristics of the immigrants or the search for the first job, some determinants of both the initial conational share and subsequent labour market outcomes are likely unobserved. OLS estimates of Equation (2) using the SIEED are likely to be biased. I therefore adopt an instrumental



variables (IV) approach to identifying the effect of the initial conational share on subsequent outcomes. The proposed instrument uses variation across districts (*Kreise*) within the same labour market in the hiring patterns of firms for a given year and nationality. Formally, the instrument is defined as follows:

$$z_i^{own} = \frac{\sum_{j \neq i} s_{f(j)}^{nat.(i)} \mathbf{1}(d_j = d_{0i}, t_j = t_{0i}, nat.(j) = mig.)}{\sum_{j \neq i} \mathbf{1}(d_j = d_{0i}, t_j = t_{0i}, nat.(j) = mig.)} \quad (3)$$

The instrument for individual  $i$  is the average share of coworkers with  $i$ 's nationality among other migrants  $j \neq i$  hired in the same district as  $i$ ,  $d_{0i}$  and the same year,  $t_{0i}$ .<sup>4</sup> The instrument is therefore a leave-out-mean and has the same structure as the instrument proposed by Arellano-Bover (2020) for the size of the establishment where Spanish school-leavers find their first job. To avoid contamination by hires throughout the year, the share of conationals  $s_{f(j)}^{nat.(i)}$  is measured on January 1 and the instrument is constructed using hires during the calendar year. The instrument can be interpreted as the predicted conational share if an immigrant were randomly assigned to a position filled in the same year by another immigrant; throughout the paper I refer to it as the predicted conational share.

The instrument relies on the idea that immigrants do not take into account firm-specific labour demand when choosing where and when to search for a job. In general, this may not be true. While immigrants may not know about individual firms' labour demand, they are likely to have more general information about time-varying aggregate labour demand conditions in different labour markets in Germany. Furthermore, immigrants know where past conationals have moved to and may expect that if they move there they will be able to draw on the help of ethnic networks in finding jobs (see, e.g., Munshi, 2003). If immigrants with different unobserved skills take differential account of this information when choosing where to locate in Germany, the instrument will not be randomly assigned. It is therefore important that the set of fixed effects  $\delta_j$  in Equation (1) includes fixed effects for labour market<sup>5</sup> by nationality by year of first job and for district (*Kreis*) by nationality, to control for immigrants' information set when choosing where to locate in Germany.

In Figure 2a I report results from a set of cross-sectional regressions where the dependant variable is taken from a set of characteristics of the individual (measured at the start of the first job), first job, and first firm on the conational share when starting the first job, and the set of fixed effects described above. In particular, if conditional random assignment holds, one would expect the individual and job characteristics to be conditionally uncorrelated with the initial conational share. This is broadly what we observe. The point estimates are clustered around zero and typically precisely estimated and statistically insignificant; the only notable exception is the dummy for being female, where a ten percentage point increase in the predicted conational

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<sup>4</sup>Note the instrument is constructed using all immigrant hires, not only immigrants hired for the first time.

<sup>5</sup>Labour markets are defined by commuter flows, see (Kropp and Schwengler, 2011); there are 50 labour markets in Germany

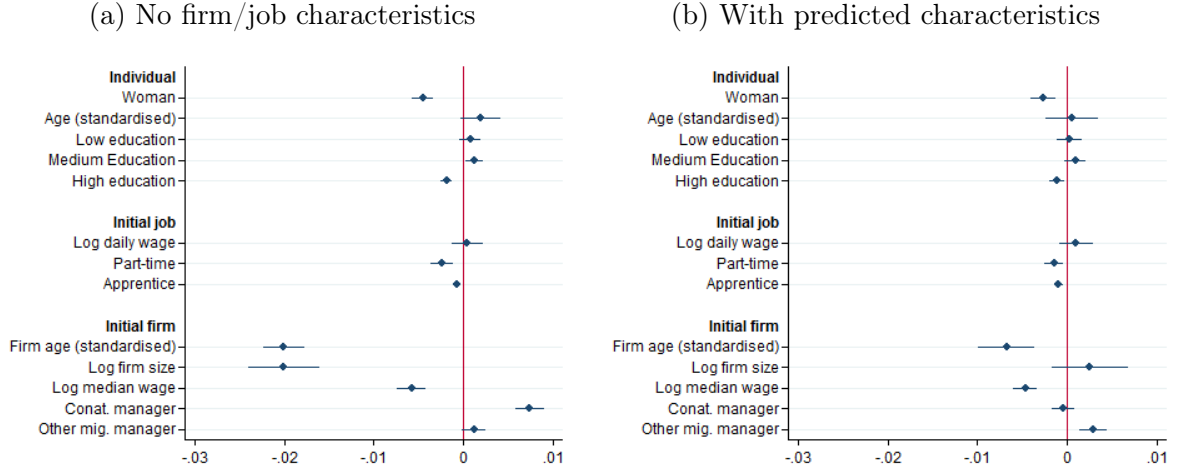


Figure 2: Effect of predicted conational share on other characteristics. All specifications include labour market  $\times$  nationality  $\times$  entry year & district  $\times$  nationality fixed effects. Standard errors are clustered by entry district; no adjustment is made for multiple hypothesis testing.

share reduces the probability an immigrant is a woman by around 0.05.<sup>6</sup>

While Figure 2a suggests the the instrument is conditionally randomly assigned, it also indicates that the exclusion restriction does not hold. Specifically, the predicted conational share also predicts other characteristics of the firm where the first job is held, which may have a direct effect on immigrants' subsequent labour market outcomes, such as the size of the firm where the first job is held (Arellano-Bover, 2020) or the presence of a conational manager at the firm (Åslund et al., 2014). To address these concerns, it is possible to use the same leave-out-mean procedure to calculate a predicted version of any initial job or firm characteristic. In Figure 2b, I include predicted part-time status, firm age, presence of a conational manager, presence of an immigrant manager from another country, and the log of predicted firm size and the predicted median wage in the firm, all calculated using the same leave-out-mean procedure, as additional controls.<sup>7</sup> When including the predicted characteristics as controls, the point estimates are now more tightly clustered around zero and typically insignificant.

Turning now to assessing the relevance of the proposed instrument, I report the results of cross-sectional regressions of the actual conational share in the first job on the predicted conational share in Table 2. In column one I report the raw correlation between the the predicted and actual conational share, which is equal to 0.57. Moving from columns 2–7, I progressively include more restrictive sets of fixed effects and, finally, controls for other predicted job and firm characteristics. Throughout,  $R^2$  rises from 0.32 to 0.57, however the instrument is highly significant and continues to predict the actual conational share almost one-to-one. I repeat the same set of regressions for the share of immigrants coming from other countries among the set of coworkers in the first job and report the results in Table A.4. While the relationship is a little

<sup>6</sup>All initial individual characteristics will nevertheless be included as controls in the main specification.

<sup>7</sup>Note that it would not be correct to include job or firm characteristics directly as controls in Equation (2). Since these characteristics are outcomes of the proposed instrument, they would be bad controls in the reduced-form equation, biasing the two-stage least squares estimate of the effect of the conational share.

weaker, the predicted share of other immigrants is nevertheless strongly predictive of the actual share of other immigrants.

Table 2: First stage effect of predicted conational share on realised share.

	(1)	(2)	(3)	(4)	(5)	(6)
Predicted conat. share	1.15** (0.057)	1.10** (0.032)	1.06** (0.031)	1.08** (0.033)	1.18** (0.055)	1.08** (0.054)
Predicted other mig. share		0.027 (0.017)	0.028+ (0.016)	0.0087 (0.016)	0.00023 (0.016)	0.0099 (0.017)
Ethnic enclaves	No	No	No	No	Yes	Yes
Prediced firm controls	No	No	No	No	No	Yes
Predicted job controls	No	No	No	No	No	Yes
N	67236	67233	67221	66289	66289	66289
$R^2$	0.32	0.41	0.43	0.57	0.57	0.57
FE	-	N, Y, D	NxY, D	LxNxY, D	LxNxY, D	LxNxY, D

*Note:* Static first-stage relationship, standard errors clustered by labour market by nationality by year of first job. +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

Finally, when estimating the dynamic effect of the conational share, the predicted conational share and other immigrant share will be interacted with the same set of time-since-migration dummies as the actual shares, as in Equation (2). Turning from estimation to inference, I report standard errors clustered at the district level. While the value of the instrument varies for each individual, the firm-level hiring shocks from which the instrument is constructed are common to immigrants finding a job in the same labour market in the same year, suggesting that the district-year is the level at which treatment is assigned and standard errors should be clustered (Abadie et al., 2017). However, firm-level labour demand shocks may be persistent over time, leading to some serial correlation in the instrument, which leads me to cluster at the district level.

## 4 The effect of the initial conational share

### 4.1 Employment rates

#### 4.1.1 Main results

I first report estimates of the effect of the starting conational share on individual employment rates. An individual's employment rate is defined as the fraction of days they are employed in a job covered by social security in a calendar year. Estimates of the effect of the conational share based on the specification defined in Equation (2) are reported in Table 3. In column 1 I report OLS estimates. Both the conational share and the share of other immigrants have a negative short-term effect on employment rates; a ten percentage point increase in the conational

share is associated with a 1.3 percentage point reduction in employment rates over the first two years. However, the negative effect of the conational share amplifies over time, rising to a 2.3 percentage point reduction in employment rates after six or more years, while the effect of the other migrant share attenuates, falling to a 0.5 percentage point reduction in employment rates after six or more years. In column 2 I instrument for the conational and other migrant shares following the approach described in Section 3.2. The observed pattern of effects becomes more pronounced; the negative effect on employment rates of a ten percentage point increase in the conational share is 2.4 in the short-term, rising to 3.3 percentage points in the longer term, while the corresponding effects for the other migrant share are 1.5 and 0.04 percentage points.

In column 3 I further instrument for initial firm age, median wage, size, and manager nationality as well as for part-time status in the first job using the predicted versions of these instruments. The point estimates are unchanged, however the joint strength of the instrument set falls, from a Kleibergen-Papp F-statistic of 107 to 33. This is both due to the fact that the proposed instruments are correlated, and because not all predicted variables are equally good predictors of the actual outcomes. This is illustrated more starkly in column 4, where I further instrument for being an apprentice. Since apprenticeships are relatively uncommon (approximately 5 per cent of my sample start as an apprentice), it is relatively poorly predicted by the share of local hires that are apprentices. Accordingly, the instrument set is weaker; the F-statistic falls to 5.7 and the estimates are slightly closer to the OLS estimates.

Since the joint strength of the instrument set is affected by having many correlated instruments, in columns 5-7 I report estimates from a cross-sectional specification. For individuals I observe for at least eight years, I calculate the employment rate over the eight years following the first job and regress this on the conational share, other migrant share, and controls. The instruments are no longer interacted with the time since treatment dummies, since the regression is cross-sectional, and the strength of the instrument set increases accordingly. In column 5 I report OLS estimates, in column 6 I instrument for the conational share, the other migrant share, other firm characteristics, and part-time status, and in column 7 I further instrument for apprentice status in the first job. The results are consistent with the dynamic specifications, in that the conational share has a clear negative effect on employment rates over the subsequent eight years, while the other migrant share is only negatively associated with employment rates, an association that disappears when using the full set of instruments.

To put the magnitude of the long-term effect into context, Glitz (2014) finds that the average employed immigrant in Germany in 2008 had 18 percentage points more conational coworkers than would be expected under a random allocation of workers, or 13 percentage points after partialling out the effects of region of residence, gender, education, and industry. The employment rate of the foreign-born in Germany at the time was 62.9 per cent, 8.7 percentage points lower than the employment rate of the native-born (OECD, 2020). Scaling the long-term effect of the conational share in my preferred specification by average segregation translates to an employment rate that is  $0.33 \times 18 = 5.9$  percentage points lower, or 4.3 percentage points if observable characteristics are partialled out of the measure of segregation. The magnitude of the long-term association between the initial conational share and employment is therefore large relative to the

difference in employment rates between immigrants and natives in Germany.

Table 3: Individual annual employment rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	2SLS	2SLS	2SLS	OLS	2SLS	2SLS
$1(t \in [0, 2]) \times \text{Conat. share}$	-0.13** (0.013)	-0.24** (0.036)	-0.24** (0.052)	-0.20** (0.068)			
$1(t \in [3, 5]) \times \text{Conat. share}$	-0.19** (0.015)	-0.29** (0.038)	-0.29** (0.055)	-0.25** (0.066)			
$1(t \geq 6) \times \text{Conat. share}$	-0.23** (0.017)	-0.33** (0.044)	-0.33** (0.062)	-0.29** (0.070)			
Conat. share					-0.12** (0.0082)	-0.15** (0.027)	-0.13** (0.027)
$1(t \in [0, 2]) \times \text{Other mig. share}$	-0.13** (0.011)	-0.15** (0.033)	-0.15** (0.037)	-0.13** (0.038)			
$1(t \in [3, 5]) \times \text{Other mig. share}$	-0.072** (0.012)	-0.040 (0.039)	-0.045 (0.043)	-0.025 (0.044)			
$1(t \geq 6) \times \text{Other mig. share}$	-0.052** (0.014)	0.0037 (0.050)	-0.0017 (0.052)	0.018 (0.052)			
Other mig. share					-0.058** (0.0065)	-0.047* (0.022)	-0.026 (0.022)
Other firm characteristics	Yes	No	Yes	Yes	Yes	Yes	Yes
Observations	760269	760269	760269	760269	66289	66289	66289
Individuals	67236	67236	67236	67236	66289	66289	66289
KP F-statistic		107.2	33.2	5.7		63.2	15.5

*Notes:* Each coefficient measures the effect of a one percentage point increase the share of coworkers on a given type on subsequent employment rates, measured in percentage points. Standard errors are clustered by district. +  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$

#### 4.1.2 Robustness

As noted in Section 2, the SIEED does not record return migrants or the self-employed. As a result, the negative employment effect of the conational share could at least in part be due to immigrants leaving the country or shifting to self-employment.<sup>8</sup> In column 1 of Table A.5, I repeat my main IV specification using a dummy for having dropped out of employment permanently, according to the SIEED, as an outcome. I find that a ten percentage point increase in the initial conational share does indeed increase the probability of dropping out of formal employment altogether, that this effect is increasing over time, and that there is no such effect for the other immigrant share. In column 2 I therefore restrict my sample to those individuals who have not yet dropped out altogether, i.e. those either working, or who will return to formal employment

<sup>8</sup>Note, however, that return migration and, to a lesser extent, self-employment are also indicative or reduced success in the labour market for immigrants. As such, the negative effect of the conational share on subsequent SIEED employment is still a measure of reduced labour market success, even if a part of it is explained by increased return migration or self-employment.

in the future. These estimates cannot be interpreted causally, since I condition on an outcome of the variable of interest, the initial conational share. Nevertheless, the initial conational share remains negatively associated with subsequent employment rates, and the effect becomes more negative over time, while the negative short-term association with the other immigrant share is again transient.

Another perspective on the relationship between the initial conational share, return migration, and self-employment is provided by the IAB-SOEP data. There is no scope for return migration to affect these data, since they are constructed by surveying immigrants still in Germany in 2013 and 2014 and then matching their survey responses retrospectively to their social security data. However, the dataset is too small to use the estimation strategy described in Section 3.2, which relies on a relatively detailed set of fixed effects. I therefore estimate descriptive regressions on the IAB-SOEP data using OLS, where, in addition to the controls included in the IV specification, I further control for pre-migration characteristics such as German proficiency, having contacts in Germany prior to migrating, and how the first job in Germany was found.

I report estimates of the dynamic association of the conational and other migration shares with employment rates in column 1 of Table 4. The results are not directly comparable to the IV estimates using the SIEED, in light of the differences in sample construction and identifying variation. However, even in a sample where all individuals are known to still be in Germany at the end of the sample period, the initial conational share is still negatively associated with subsequent employment rates and the association becomes more negative over time; the other immigrant share is not significantly associated with subsequent employment at any time horizon. The SOEP also contains information on employment as a civil servant or in self-employment for 2013 and 2014, the categories of employment not covered in the SIEED. I use an indicator for these as the outcome in columns 2 and 3. The association of both share variables with employment in the civil service is quite precisely estimated to be zero. The estimated association with self-employment is more noisy, however the coefficients for the conational share are positive and, for 3–5 years after entering employment, significantly so. One therefore cannot rule out that part of the negative employment effect estimated on the SIEED is due to an increase in self-employment.<sup>9</sup>

Having established that the estimated effect of the conational share on employment is unlikely to be fully explained by either return migration or self-employment, I also assess the robustness of various assumptions I make about the functional form, embedded in Equation 2. First, the effect of the conational share may not be constant across firms of different sizes. In Table A.6, I estimate Equation (2) on the SIEED separately for different size classes via OLS.<sup>10</sup> The long-term association is largest when the initial firm employed 10–49 employees, and is imprecisely estimated for very large firms, employing more than 500 employees. However, in all cases the results are qualitatively similar, suggesting the assumption that the effect can reasonably be

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<sup>9</sup>Andersson (2021) finds that refugee’s self-employment is positively affected by the share of self-employed coethnics in the municipality of entry, but not by the share of co-ethnics per se. There may therefore be no strong reason *a priori* to presume that a higher share of conationals in the first job in formal employment might have an effect on subsequent self-employment.

<sup>10</sup>The subsamples used in this and the following exercises are too small to use the proposed instrument, as it lacks power in small samples.

assumed to be constant for different firm sizes.

Table 4: Employment measures in the IAB-SOEP-MIG-ADIAB

	(1)	(2)	(3)
	Emp. rate	Civil servant	Self-employed
$\mathbf{1}(t \in [0, 2]) \times \text{Conat. share}$	-0.0080 (0.058)	-0.0030 (0.013)	0.15 (0.16)
$\mathbf{1}(t \in [3, 5]) \times \text{Conat. share}$	-0.071 (0.067)	-0.030 (0.019)	0.38* (0.18)
$\mathbf{1}(t \geq 6) \times \text{Conat. share}$	-0.14* (0.070)	0.0070 (0.0077)	0.076 (0.061)
$\mathbf{1}(t \in [0, 2]) \times \text{Other mig. share}$	-0.030 (0.045)	0.014 (0.014)	0.021 (0.035)
$\mathbf{1}(t \in [3, 5]) \times \text{Other mig. share}$	-0.053 (0.059)	-0.012 (0.013)	-0.055 (0.041)
$\mathbf{1}(t \geq 6) \times \text{Other mig. share}$	-0.060 (0.064)	-0.0074 (0.0060)	-0.0053 (0.032)
Observations	10061	1506	1506
Individuals	863	849	849
$R^2$	0.13	0.14	0.08

*Notes:* Each coefficient measures the effect of a one percentage point increase the share of coworkers on a given type on subsequent employment rates, measured in percentage points. Column 1 uses employment rates calculated from social security records, columns 2 and 3 use indicators for types of employment calculated from the SOEP in 2013 and 2014. Standard errors are clustered by individual. +  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$

Second, the effect may be non-monotonic in the conational share (c.f. Ansala et al., 2021). In Figure A.2 I plot the average employment rate for different categories of the initial conational share, conditional on included controls. All averages are expressed as deviations from the employment rate of individuals whose initial conational share is less than 5 per cent in their first two years of employment.<sup>11</sup> The association between the initial conational share and long-term employment rates does appear to be monotone.

Third, the grouping of time dummies in Equation (2) may be overly restrictive. I estimate a specification by OLS where I allow the effect of both group shares to vary for each year since the start of the job. The estimated coefficients are reported in Figure A.3. The time pattern of effects is similar to what I observe with the simpler specification, although there is a clear drop-off in the association between the initial conational share and employment rates between years zero and one that is obscured by the grouping of time dummies.

<sup>11</sup>These averages are estimated by replacing the interactions of the conational share with years since migration in Equation (2) with a full set of interactions between the years since migration and a set of dummies for the base year immigrant share taking values from [0, 5), [5, 10), [10, 50), [50, 90), and [90, 100]; individuals with a conational share in the 0–5 per cent range in their first two years of employment are the omitted category.



## 4.2 Wage earnings

I repeat my main specification using different measures of wages as outcomes, conditional on employment, and report the results in Table 5. The social security data only include daily wages, rather than hourly wages, and an indicator for part-time status. In column 1 I therefore estimate the association between the initial conational share and average daily earnings, defined, for individuals who work at least one day during the year, as total earnings subject to social security in a year divided by total number of days worked, deflated to 2010 values. In columns 2 and 3 I repeat I condition on working either full-time or part-time on June 30, to account for the effect of hours worked in a day. While there is a short-term positive association between the initial conational share and the daily wage in all cases, there is no longer-term association, conditional on being employed. The share of immigrant coming from other countries appear, if anything, negatively associated with wages conditional on employment in the long-run, however the shorter-run patter is less clear.

In columns 4–6 I repeat the same specifications, this time instrumenting for the conational share, other immigrant share, as well as the set of other firm characteristics (age, median wage, size, manager nationality) and part-time status in the first job. Now there is no significant association between the initial conational share and average daily wages at any time horizon. However, conditional on working part-time, there is a negative association between the initial conational share and wages in the long-term, and the magnitude of the association is quite large. A ten percentage point increase in the initial conational share is associated with a 7.5 percent decrease in the daily wage. On the other hand, the share of immigrants from other countries of origin appears to be positively associated with daily wages in the long-term, in spite of a more mixed patter of associations in the shorter-term. Here the effect of a ten percentage point increase in the other migrant share is associated with a 2.3 percent increase in wages for full-time workers and a 6.8 percent increase in wages for part-time workers.

It is important to note that conditioning the analysis on employment, or on full- or part-time employment creates a selection bias. Individuals who are employed, whether full-time or part-time, in spite of having a high conational share in their first job are potentially positively selected on unobserved employability relative to other immigrants, introducing a conditional-on-positive selection bias (Angrist and Pischke, 2009). This kind of selection would likely bias the estimated association between the initial conational share and potential subsequent earnings upward relative to the true association in the full, unobservable, population. As such, while the associations presented in Table 5 provide *prima facie* evidence against a wage effect of the initial conational share, it is ultimately not possible to conclude whether the true causal effect of the initial conational share on wages is zero, as these estimates suggest, or negative but biased toward zero when conditioning on individuals being employed.

The finding of a clear negative effect of the starting conational share on long-term employment, contrasting with limited evidence of a wage effect is consistent with the finding that the total earnings gap between immigrants and natives is mostly due to differences in employment, not wages conditional on employment (Sarvimäki, 2011).



Table 5: Relation between initial workplace composition and log wages

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	2SLS	2SLS	2SLS
$\mathbf{1}(t \in [0, 2]) \times \text{Conat. share}$	0.19** (0.024)	0.075** (0.024)	0.20** (0.041)	0.12 (0.096)	-0.19* (0.084)	0.21 (0.18)
$\mathbf{1}(t \in [3, 5]) \times \text{Conat. share}$	0.095** (0.024)	0.0089 (0.021)	0.20** (0.048)	0.19 (0.12)	-0.011 (0.098)	0.068 (0.21)
$\mathbf{1}(t \geq 6) \times \text{Conat. share}$	-0.025 (0.038)	-0.075* (0.036)	0.065 (0.055)	0.018 (0.26)	0.036 (0.21)	-0.72** (0.24)
$\mathbf{1}(t \in [0, 2]) \times \text{Other mig. share}$	0.017 (0.021)	-0.060** (0.019)	0.12** (0.033)	-0.13+ (0.070)	-0.32** (0.062)	0.24* (0.11)
$\mathbf{1}(t \in [3, 5]) \times \text{Other mig. share}$	-0.078** (0.023)	-0.14** (0.022)	-0.034 (0.037)	-0.055 (0.077)	-0.29** (0.069)	0.27* (0.12)
$\mathbf{1}(t \geq 6) \times \text{Other mig. share}$	-0.042 (0.029)	-0.049* (0.024)	-0.090* (0.042)	0.54** (0.10)	0.23** (0.090)	0.66** (0.16)
Observations	476749	320615	156495	476749	320615	156495
Individuals	67235	54779	35483	67235	54779	35483
KP F-statistic				34.4	33.2	15.1
Subsample	all	FT	PT	all	FT	PT

*Note:* Columns 1–3 report OLS estimates of relationship between initial conational share and log wages, conditional on employment, columns 4–6 report equivalent 2SLS estimates. The regression for average wages in columns 1 and 4 are estimated conditional on an individual being employed in a job covered by social security at least one day during the year, daily wages in columns 2, 3, 5, and 6 are measured on June 30 of the relevant year and condition on full- or part-time employment on that day. All coefficients are estimated using the specification defined in Equation (2), wages are deflated to 2010 values. Standard errors are clustered by initial district. +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ .

## 5 Mechanisms and interpretation

### 5.1 Review of relevant theoretical mechanisms

In this section I review different theories relevant to understanding the observed effect of the initial conational share on labour market outcomes, and in particular on employment rates. I distinguish between three broad categories of mechanisms: (i) the conational share in the first job is related to wages in the first job, which have persistent effects on subsequent outcomes; (ii) the conational share in the first job affects the speed at which immigrants accumulate host-country specific capital; and (iii) the conational share in the first job affects the ability of immigrants to search for subsequent jobs, in particular via its effects on the immigrants' job-search networks. I pay particular attention to whether these theories make different predictions about the effect of the conational share and the other immigrant share on subsequent outcomes.

#### 5.1.1 Wage and productivity in the first job

The composition of the set of co-workers at the start of the first job may be associated with the wage in the first job. If, say the conational share is positively associated with the starting wage, then it will also improve a worker's starting position on the job ladder (Burdett and Mortensen, 1998). On the other hand, if the association is negative, a higher conational share will worsen an immigrant's starting position on the job ladder. This effect will be propagated to wages in subsequent jobs if the current wage is the threat point when bargaining (Postel-Vinay and Robin, 2002), and may also affect subsequent employment rates if, for example, past wages are taken as a signal of productivity.

The conational share might be associated with starting wages because it correlates with other relevant job characteristics. For example, a higher conational share is correlated with having received the job through a referral (Dustmann et al., 2016), or having a conational manager (Åslund et al., 2014). The immigrant share, i.e. both the conational share and the other migrant share, might also be negatively correlated with firm productivity (Damas de Matos, 2012). However, such relationships are arguably better classified as confounders for the effect of the composition of the set of coworkers, rather than mechanisms, since they are not direct outcomes of the conational or other migrant shares. The use of the IV estimation strategy described in Section 3.2 is in part intended to rule out such confounding by correlated job characteristics.

However, the migrant share may also directly affect worker productivity in the first job, particularly if there are costs to working in mixed teams (Glover et al., 2017; Hjort, 2014; Lazear, 1999b,a).<sup>12</sup> In this case, the conational share and, perhaps to a lesser extent, the other immigrant share, will have a positive effect on the wage in the first job, which may increase subsequent wages and employment rates. On the other hand, the theory of compensating differentials (Rosen, 1986) suggests that a higher conational share in the first job could lower the starting wage, if

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<sup>12</sup>Peri and Sparber (2009) and Ottaviano and Peri (2012), provide evidence of aggregate complementarities between immigrants and natives, however it is not clear whether such complementarities arise within firms, or by increasing the scope for specialisation across firms.

immigrants prefer to work with their conationals, with negative longer-term effects. Which effect dominates is an empirical question.

### 5.1.2 Job search and social networks

The initial conational share may also affect the ability of individuals to search for subsequent jobs, since individuals use their social networks both as a source of either information about job openings (Calvó-Armengol and Jackson, 2004; Boucher and Goussé, 2019) and of referrals when applying for jobs (Montgomery, 1991; Galenianos, 2013; Dustmann et al., 2016). In particular, Eliason et al. (2019) show that coworker networks are a particularly important determinant of labour market outcomes, more so than residential networks. It is well-documented that immigrants have lower wages and are less likely to be employed than natives (e.g. Lubotsky, 2007; Sarvimäki, 2011). Having a greater fraction of unemployed former coworkers has been shown to lower the rate of arrival of job offers for unemployed workers (Cingano and Rosolia, 2012; Glitz, 2017). It will also lower the probability of receiving a referral, since only employed workers can provide referrals, likely lowering the offered wage. The conational share and other migrant share may therefore worsen the quality of an immigrant’s job search network, lowering wages and employment rates<sup>13</sup>

Immigrants may also interact more intensively with their conational coworkers than with other types of workers, given the well-documented tendency towards homophily in the constitution of social networks (McPherson et al., 2001). In the terminology of Granovetter (1995), the strength of the tie between an immigrant and their coworkers is likely to decrease from conationals to other immigrants and finally natives. If the offer rate is higher from weak ties (Montgomery, 1992), having more native coworkers in the first job (and perhaps also more other immigrant coworker, if ties with them are sufficiently weak) may raise employment and reservation wages in the longer run.<sup>14</sup> One reason why the offer rate might be higher from weak ties is that conationals may be competing against each other for the same information (Beaman, 2012).

### 5.1.3 Human capital accumulation

Finally, the initial conational share might also affect subsequent outcomes through traditional human capital accumulation channels. Acquiring host country-specific human capital has been shown to account for a substantial portion of the convergence of immigrant wages to native wages

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<sup>13</sup>The size of the effect of the conational share on job search networks is likely to be heterogeneous by nationality; immigrants from groups with worse employment outcomes on average may be more negatively affected by starting out in a high-conational share firm. The size of the other immigrant share will depend on whether other immigrant groups have on average better employment outcomes than the worker’s own group. If they have worse outcomes, other immigrants will be a worse source of information and referrals than the own group, and the negative effect of the other immigrant group will be larger in absolute value than the effect of the conational share.

<sup>14</sup>Empirical evidence on the value of weak ties is more mixed; strong ties appear more productive in the sense that an individual is more likely to end up working with a given strong tie than a given weak tie (Gee et al., 2017b,a), however this does not imply that having more strong ties leads to higher or lower wage offers on average, as predicted by the theory. The result is also subject to selection bias, since it relies on accepted jobs, not on all job offers.

over time (Eckstein and Weiss, 2010). Furthermore, Battisti et al. (2018) show that a higher share of conationals in the district of residence lowers the acquisition of host country-specific human capital in the longer run. They argue that this is because a larger share of conational co-residents makes job-finding easier, lowering the benefit from acquiring host country-specific human capital, though it is possible that it also raises the cost, e.g. of learning the host country’s language.

A higher conational coworker share may, like the share of conational neighbours, lower the benefit of acquiring host country-specific human capital, though the effect is likely to be attenuated relative to the co-resident conational share, since it concerns individuals who have already found a job. However, it clearly raises the cost of acquiring the host country’s language, which could have a negative effect on long-term outcomes. The other immigrant share likewise probably only weakly affects the benefit of acquiring human capital for individuals already holding a job, but, holding the conational share constant, it will probably raise the cost of learning the host country’s language, since the worker interacts less with native speakers. Both the conational share and the other migrant share might therefore slow down the acquisition of Germany-specific human capital.

## 5.2 Evidence

### 5.2.1 Wages and productivity in the first job

In Table 6 I report estimates from cross-sectional regressions of outcomes related to the first job on the conational share, the other migrant share, and the same set of individual, job and firm controls. In particular, I consider the wage in the first job, the duration of the first job, and an indicator for leaving the first job for another job (as opposed to unemployment) as outcomes. The conational share has a positive effect on the wage in the first job; IV estimates in reported in column 2 show that a ten percentage point increase in the conational share increases the starting wage by 3.1 per cent. However, the effect of a ten percentage point increase in the other migrant share is almost identical, increasing the wage 2.9 per cent. One can conclude that the preference for working with conationals, via compensating differentials, is unlikely to be a major determinant of immigrant wages. Rather, the evidence in column 2 is consistent with a higher migrant share suggesting that an immigrant is more productive in the firm.

Turning to the duration of the first job, the OLS estimates in column 3 show a higher conational share and a higher other migrant share are both associated with shorter job durations; a ten percentage point increase in either is associated with jobs that last 6 percent fewer days. However, the associated IV estimates, in column 4, is smaller and not significant. The pattern of effects of both share variables on wages and job duration and, notably, the fact that there is no significant difference between conationals and other immigrants, therefore suggest that the negative effect of conationals on subsequent employment rates is not due to differences in productivity or wages in the first job having persistent effects.

On the other hand, there is a significant difference in the effect of the share variables on the probability of transitioning to another job when the first job ends. Focusing on the IV

Table 6: Outcomes in first job

	ln(wage <sub>0</sub> )		ln(duration)		EE transition	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Conat. share	0.24** (0.022)	0.31** (0.084)	-0.58** (0.058)	-0.37 (0.25)	-0.19** (0.018)	-0.28** (0.071)
Other mig. share	0.21** (0.020)	0.29** (0.070)	-0.58** (0.042)	-0.15 (0.15)	-0.027* (0.014)	-0.056 (0.050)
Observations	66289	66289	60192	60192	60467	60467
KP F-statistic		66.88		61.69		62.0
Subsample	all	all	UT	UT	UT	UT

*Note:* UT denotes untruncated job spells, i.e. completed job spells. Standard errors clustered by initial district. + p<0.1, \* p<0.05, \*\* p<0.01

estimates in column 6 of Table 6, a ten percentage point increase in the conational share lowers the probability of an employment-to-employment transition by a highly significant 2.8 percentage points. The effect of the other migrant share, on the other hand, is only half a percentage point, is not statistically significant, and is relatively precisely estimated. This evidence points the conational share in the first job being detrimental to an individual's ability to find subsequent jobs.

### 5.2.2 Job search and social networks

While columns 5 and 6 of Table 6 consider the type of transition from the first job, in Table 7 I study how the share variables affect the duration of the unemployment spells, conditional on becoming unemployed. OLS estimates on the full sample in column 1 show that the conational share is positively associated with the duration of unemployment spells, while the other migrant share is negatively associated with the duration of unemployment spells. These patterns hold up if I limit attention to untruncated spells in column 2, ruling out mismeasurement due to unobserved return migration, or to spells immediately following a plant closure in columns 3 and 4, ruling out endogenous selection into unemployment as a result of the initial conational share. In columns 5 and 6 I report IV estimates for all unemployment spells and for untruncated spells. Only the first is statistically significant, though the IV estimate for the effect of a ten percentage point increase in the conational share is still a moderately economically significant 2 per cent increase in unemployment duration.

The evidence presented here suggests that a higher initial conational share does indeed worsen an immigrant's ability to search for jobs in the future. This is consistent with different network-based explanations; for example conationals are likely to be stronger ties; a higher conational share may therefore reduce the job offer arrival rate. They may also be less employed on average, which will also reduce the offer arrival rate.

Table 7: Log duration of unemployment spells

	OLS				2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Conat. share	0.32** (0.043)	0.19** (0.041)	0.48* (0.22)	0.31 (0.22)	0.44** (0.14)	0.18 (0.14)
Other mig. share	-0.10** (0.036)	-0.074* (0.034)	-0.40* (0.20)	-0.42* (0.20)	-0.16 (0.13)	0.068 (0.13)
Observations	185868	153323	6531	5373	185868	153323
Individuals	56229	44751	5024	4047	56229	44751
KP F-statistic					74.6	53.8
Subsample	all	UT	C	UTC	all	UT

*Note:* UT denotes untruncated job spells, i.e. completed unemployment spells, C denotes spells that follow a plant closure, while UTC is the intersection of both conditions. Standard errors clustered by initial district. +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

### 5.2.3 Human capital accumulation

It may be, however, that a higher conational share doesn't directly affect an immigrant's job-finding ability, rather it makes them less productive once hired, which makes it harder for them to receive offers from employers conditional on applying for jobs. A higher conational share may lower an immigrant's productivity by reducing the amount of Germany-specific human capital accumulated during the course of the first job. The SIEED does not contain information on human capital information that would allow me to test this possibility, however, the matched SOEP data on non-return migrants can provide some descriptive evidence. In Table 8, I report the effect of the share variables on German proficiency, measured at the time of the survey, as well as on having participated in formal education (including apprenticeships, technical college diplomas, and university qualifications).

Both share variables are negatively associated with German proficiency in the short-run; proficiency is around five percentage points lower when either share variable is 10 percentage points higher. However, this association fades over time and is lower than one percentage point and insignificant six or more years after the start of the job. This suggests that, while working with fewer natives does slow down the acquisition of host country-specific human capital, specifically German skills, this effect is not specific to the conational share and does not persist in the long-term.

On the other hand, the conational share is negatively associated with having completed some form of training or education in Germany, while the other migrant share is not (column 2) and this association is entirely due to training that took place after the start of the first job (column 3). This association could, however, be explained by the fact that individuals with reduced employment rates or who have dropped out of the labour market may have fewer incentives to participate in training, if they don't expect to find a job. Lower employment rates will also directly lower access to on-the-job training, in the form of apprenticeships. As a result, while the evidence presented in Table 8 does not conclusively rule out differential Germany-specific human

capital accumulation as a mechanism to explain the negative effect of the initial conational share on job-finding ability, it suggests it is unlikely to be the main mechanism at play.

Table 8: Human capital accumulation

	(1) Proficiency	(2) Training in DE	(3) Training   entry
$\mathbf{1}(t \in [0, 2]) \times \text{Conat. share}$	-0.50** (0.16)	-0.017 (0.049)	0.043 (0.042)
$\mathbf{1}(t \in [3, 5]) \times \text{Conat. share}$	-0.28 (0.17)	-0.088 (0.056)	-0.040 (0.052)
$\mathbf{1}(t \geq 6) \times \text{Conat. share}$	-0.10 (0.087)	-0.16** (0.057)	-0.14** (0.054)
$\mathbf{1}(t \in [0, 2]) \times \text{Other mig. share}$	-0.45* (0.18)	0.029 (0.054)	0.083* (0.037)
$\mathbf{1}(t \in [3, 5]) \times \text{Other mig. share}$	-0.23+ (0.13)	-0.088 (0.062)	-0.052 (0.045)
$\mathbf{1}(t \geq 6) \times \text{Other mig. share}$	-0.075 (0.079)	-0.039 (0.077)	-0.025 (0.067)
Observations	1687	10061	10061
Individuals	850	863	863
$R^2$	0.28	0.23	0.26

*Note:* The dependent variable in column 1 is an indicator for reporting being proficient in German at time  $t$ , in column 2 it is an indicator for having completed some form of post-school education in Germany by time  $t$ , in column 3 it is an indicator for having completed some form post-school education in Germany that took place after having entered the labour market by time  $t$ . All specifications include controls for pre-migration characteristics, method of finding first job, other job characteristics, and demographic characteristics. Standard errors clustered by initial district.  
+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

### 5.3 Interpretation in relation to previous findings

Recent evidence on the effect of the conational residential network suggests a dynamic trade-off. Immigrants living in areas with more conationals are better integrated into the labour market in the short-run, but these differences disappear in the long-run (Battisti et al., 2018). While Battisti et al. (2018) suggest this is because a higher conational share among neighbours lowers the incentive to acquire human capital, the findings reported here suggest another, potentially complementary reason for the dynamic tradeoff they document. Individuals living in a location with a higher share of conationals may be able to draw on these conationals to find a job more quickly, however these jobs, likely obtained through referrals, are likely to be in firms with a higher share of conationals. While a higher conational residential share would therefore speed up entry into the labour market, it will slow down convergence to natives once entry takes place.

The individuals in the SIEED are only observed once they find work. However, I do provide supporting descriptive evidence, drawing on the SOEP, for the mechanism described here. In

Figure A.4a, I plot the average conational and other migrant share by years until the first job. A relatively clear pattern emerges where individuals who find work quicker do so in higher conational share firms, for which there may be a future cost, in reduced subsequent employment. The share of immigrants from other countries of origin, on the other hand appears to be relatively flat over time taken to find the first job.

## 6 Conclusion

In this paper I have shown that starting one's career in an establishment with a high share of conationals has negative long-term effects on an immigrant's labour market outcomes and particularly their employment rate. This is in contrast to the literature on initial residential conditions for newly arrived immigrants, where a high share of conationals in an immigrant's location of residence, by expanding the size of an individual's network, is generally thought to have positive effects on an immigrant's labour market outcomes. The effect is also specific to an immigrant's conationals; there is no statistically significant penalty for working with immigrants from other countries of origin. Descriptive evidence suggests that the negative effect is not due to a reduced acquisition of Germany-specific human capital. Instead, I show indirect evidence that working with more conationals worsens the quality of an immigrant's social network, making it harder to find jobs in future. Future research could move beyond the first job, to understand what role improvements to coworker networks over time spent in the host country play in longer-term immigrant earnings assimilation.



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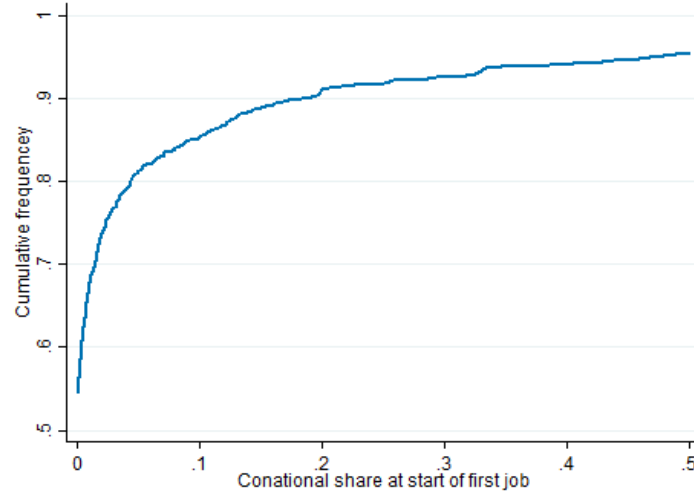
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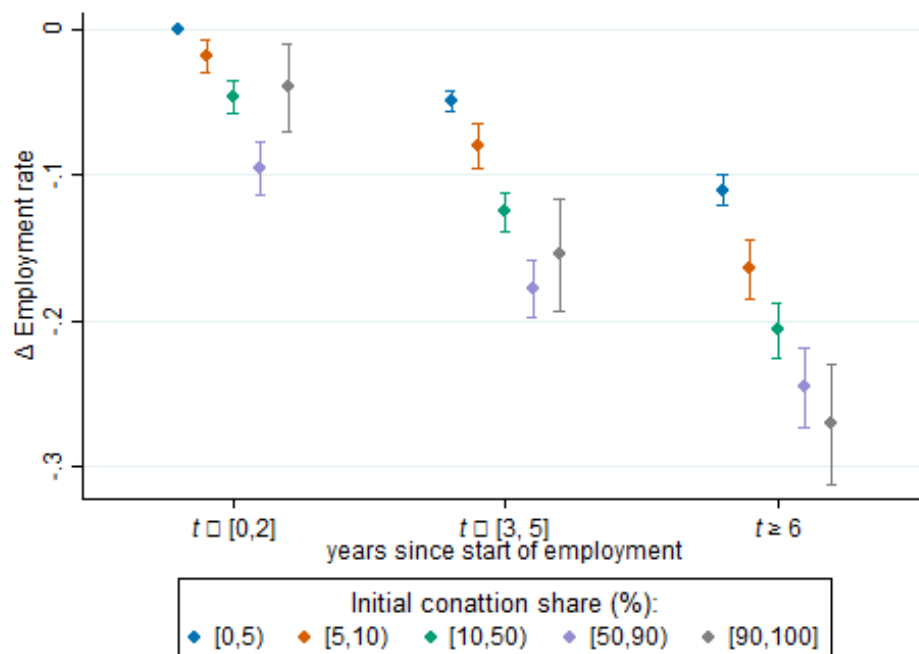
## A Supplementary figures and tables

Figure A.1: CDF of conational share in first job in SOEP



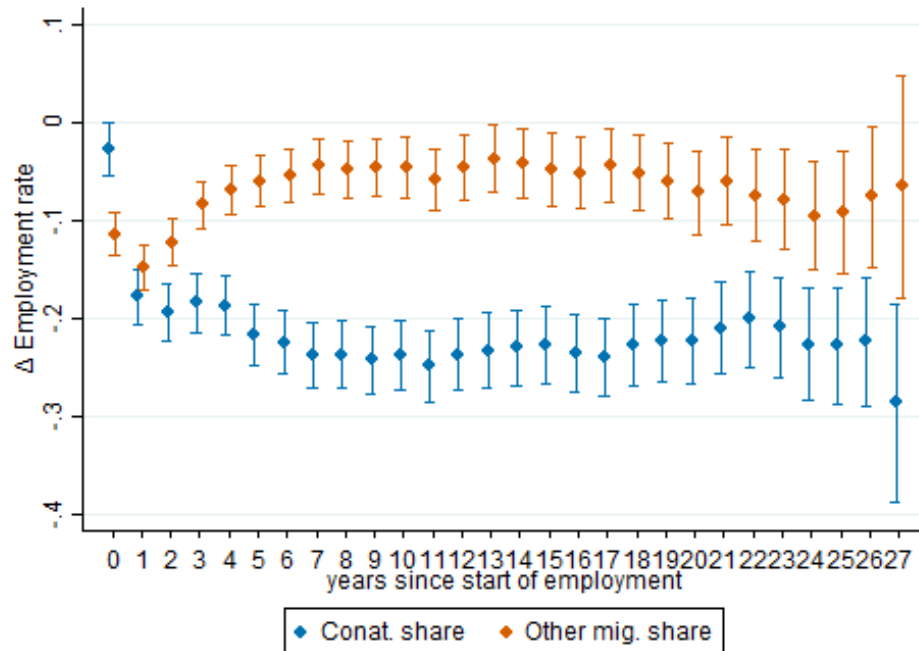
*Notes:* Empirical CDF of the initial conational share in the first job held by an immigrant in my sample. The distribution is truncated at 50, for ease of representation.

Figure A.2: Non-linear employment effect of composition of coworkers



*Notes:* Indicators for each category, coworker share in  $[0, 5)$  in the first two years of employment is the omitted category. The full set of controls and fixed effects is included, 95 per cent confidence intervals are calculated using standard errors clustered by individual.

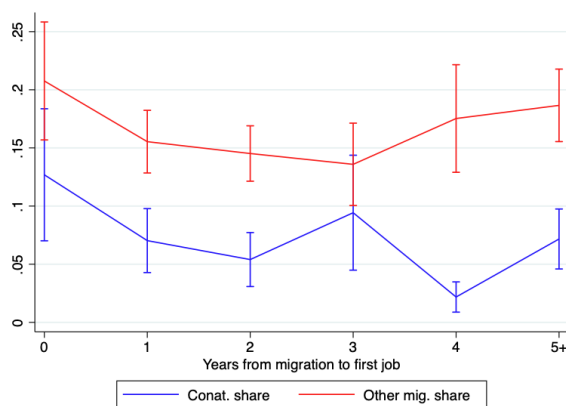
Figure A.3: Annual associations



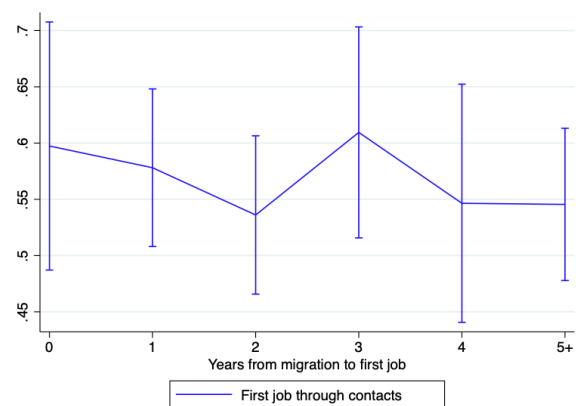
Notes: OLS estimates of the annual association of the conational share other immigrant share. 95 per cent confidence intervals are calculated using standard errors clustered at the initial district level.

Figure A.4: Time taken until first employment

(a) Initial share



(b) First job through contacts



Notes: Mean and 95 per cent confidence intervals. Source: IAB-SOEP-MIG-ADIAB.

Table A.1: Country groups, SIIED

	N	Share
Poland	9447	14.05
Rumania	7292	10.85
Yugoslavia, Serbia, Montenegro	5306	7.89
other Asia	5295	7.88
other Africa	3218	4.79
Bulgaria	2935	4.37
Russia, Belarus, USSR	2672	3.97
Croatia	2464	3.66
Hungary	2113	3.14
other America	1497	2.23
Spain	1472	2.19
Portugal	1455	2.16
ex-Czechoslovakia	1442	2.14
China	1400	2.08
France	1358	2.02
USA, Canada	1345	2.00
Bosnia and Herzegovina	1288	1.92
Uk, Ireland	1163	1.73
Ukraine, Moldova	1161	1.73
Afghanistan	1038	1.54
Morocco	998	1.48
India	955	1.42
Austria	948	1.41
Iran	918	1.37
other Europe	856	1.27
Vietnam	832	1.24
Estonia, Latvia, Lithuania	788	1.17
Netherlands, Luxemburg	716	1.06
Irak	712	1.06
Albania	651	0.97
Macedonia	519	0.77
Thailand	386	0.57
Ghana	337	0.50
Lebanon	334	0.50
Tunisia	310	0.46
Denmark, Sweden	276	0.41
Sri Lanka	272	0.40
Philippines	222	0.33
Belgium	175	0.26
Slowenia	167	0.25
Switzerland	162	0.24
Oceania	138	0.21
Etheopia	134	0.20
Finland	69	0.10
Total	67236	100.00

*Note:* Refers to first nationality reported in social security notifications.

Table A.2: Summary statistics, SOEP-IAB data

	Mean	St. dev.	N
Panel A			
Employment rate	0.74	0.38	10061
Annual wage earnings	21256.1	15024.9	7493
$\mathbf{1}(t \in [0, 2])$	0.25	0.44	10061
$\mathbf{1}(t \in [3, 5])$	0.23	0.42	10061
$\mathbf{1}(t \geq 6)$	0.52	0.50	10061
Panel B			
Woman	0.50	0.50	863
Age at migration	29.32	9.04	863
Employed before migrating	0.71	0.46	863
Education	0.14	0.34	863
Low education	0.40	0.49	863
Medium education	0.32	0.47	863
High education	0.29	0.45	863
Support (family)	0.47	0.50	863
Support (friends)	0.10	0.31	863
Support (both)	0.05	0.22	863
No support	0.37	0.48	863
Panel C			
First job through contacts	0.56	0.50	863
Years until first job	3.27	3.02	863
Daily wage	43.1	34.3	863
Firm size	470.4	2221.8	863
Firm median wage	74.3	39.5	863
Firm age	13.0	10.5	863
Conat. share	0.070	0.19	863
Other mig. share	0.17	0.20	863

*Note:* Panel A reports time-varying summary statistics for the years since the first job, average earnings are conditional on being employed on June 30. Panel B reports summary statistics on pre-migration characteristics. Panel C reports summary statistics on the characteristics of the first job held after migration and the firm where the job was held. Wages and earnings are deflated and reported in 2010 Euros.



Table A.3: Country groups,  
SOEP-IAB

	N	Share
Russia	323	37.43
Romania	114	13.21
Poland	93	10.78
ex-Yugoslavia	71	8.23
Turkey	65	7.53
Asia	52	6.03
Italy	41	4.75
Other Europe	38	4.40
Africa	29	3.36
Greece	2*	2.55
Others	//	////
Total	863	100.00

*Note:* Refers to country of birth (as self-reported in the SOEP) for individuals born without German nationality. The table has been censored in accordance with IAB data protection requirements.

Table A.4: First stage effect of predicted conational share on realised share.

	(1)	(2)	(3)	(4)	(5)	(6)
Predicted conat. share		0.013 (0.024)	0.018 (0.024)	0.035 (0.028)	-0.0037 (0.040)	-0.025 (0.039)
Predicted other mig. share	0.79** (0.019)	0.64** (0.021)	0.64** (0.019)	0.62** (0.019)	0.61** (0.018)	0.64** (0.019)
Ethnic enclaves	No	No	No	No	Yes	Yes
Firm controls	No	No	No	No	No	Yes
Job controls	No	No	No	No	No	Yes
N	67236	67233	67221	66289	66289	66289
$R^2$	0.24	0.31	0.33	0.47	0.47	0.47
FE	-	N, Y, D	NxY, D	LxNxY, D	LxNxY, D	LxNxY, D

*Note:* Static first-stage relationship, standard errors clustered by labour market by nationality by year of first job.  
+ p<0.1, \* p<0.05, \*\* p<0.01

Table A.5: Other outcomes measured in the SIEED

	(1)	(2)	(3)	(4)
	Not in IEB	Employment rate	Conat. share	Other migrant share
$\mathbf{1}(t \in [0, 2]) \times \text{Conat. share}$	0.11* (0.046)	-0.23** (0.046)	0.89** (0.023)	0.015 (0.025)
$\mathbf{1}(t \in [3, 5]) \times \text{Conat. share}$	0.29** (0.053)	-0.19** (0.051)	0.80** (0.037)	0.099* (0.046)
$\mathbf{1}(t \geq 6) \times \text{Conat. share}$	0.31** (0.057)	-0.27** (0.068)	0.56** (0.057)	0.27** (0.071)
$\mathbf{1}(t \in [0, 2]) \times \text{Other mig. share}$	0.027 (0.035)	-0.21** (0.031)	0.025+ (0.014)	0.87** (0.016)
$\mathbf{1}(t \in [3, 5]) \times \text{Other mig. share}$	-0.042 (0.042)	-0.073* (0.036)	0.055* (0.022)	0.80** (0.026)
$\mathbf{1}(t \geq 6) \times \text{Other mig. share}$	-0.069 (0.055)	-0.015 (0.042)	0.041 (0.030)	0.69** (0.040)
Observations	760269	542746	126703	126703
Individuals	67236	67236	44097	44097
KP F-statistic	33.1	34.9	19.7	19.4

*Notes:* Each coefficient measures the effect of a one percentage point increase the share of coworkers. In column one the outcomes is an indicator for having permanently left employment according the SIEED and in column two it is the annual individual employment rate, conational on not having permanently left the SIEED. In column three the outcome is the contemporaneous conational share, in column four the contemporaneous share of other migrants, in both cases conditional on being employed on June 30. Standard errors are clustered by district. +  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$

Table A.6: Heterogeneity by size of initial firm

	(1)	(2)	(3)	(4)
$\mathbf{1}(t \in [0, 2]) \times \text{Conat. share}$	-0.069** (0.024)	-0.16** (0.025)	-0.24** (0.035)	-0.24 (0.35)
$\mathbf{1}(t \in [3, 5]) \times \text{Conat. share}$	-0.12** (0.027)	-0.30** (0.028)	-0.25** (0.040)	-1.17* (0.51)
$\mathbf{1}(t \geq 6) \times \text{Conat. share}$	-0.17** (0.027)	-0.36** (0.031)	-0.29** (0.065)	-0.90 (0.55)
$\mathbf{1}(t \in [0, 2]) \times \text{Other mig. share}$	-0.058* (0.026)	-0.091** (0.021)	-0.17** (0.022)	-0.18* (0.087)
$\mathbf{1}(t \in [3, 5]) \times \text{Other mig. share}$	-0.057* (0.029)	-0.047+ (0.025)	-0.11** (0.024)	0.13 (0.089)
$\mathbf{1}(t \geq 6) \times \text{Other mig. share}$	-0.083** (0.030)	-0.038 (0.029)	-0.039 (0.030)	0.26** (0.095)
Avg. share own	0.22	0.16	0.10	0.070
Avg. share other	0.24	0.24	0.27	0.24
Observations	137883	227091	290962	104328
Individuals	10897	19426	27258	9650
$R^2$	0.35	0.33	0.27	0.35
Firm size	2-9	10-49	50-499	500+

*Notes:* Each coefficient measures the association between a one percentage point increase the share of coworkers and subsequent employment rates, estimated by OLS. Each column reports the association for a different size class. Standard errors are clustered by district. +  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$