Regional Labor Demand, Occupational Persistence and Social Mobility in Germany*

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Abstract

Intergenerational persistence in occupational choice is one of the main drivers of income persistence and thus a key determinant of social mobility. In studying this phenomenon, the existing literature has focused exclusively on supply-side mechanisms by assuming that children can freely choose which occupation to work in. This paper, however, quantifies the importance of regional labor demand by merging regional and occupation-specific vacancy shares covering 400 regions and 436 occupations with the German Socio-Economic Panel. The main result indicates that controlling for labor demand reduces occupational persistence by up to 10 percent, the same magnitude as controlling for children's education does. Furthermore, I find that the degree of occupational persistence is relatively homogeneous across parent-child combinations. A child is about 20 times more likely to work in a given occupation if the parent works in that occupation. Finally, children who follow into their parents' occupation experience an initial wage premium of about 6 percent and their annual unemployment risk is halved.

Keywords: Social Mobility, Spatial Economics, Occupational Choice, Labor Market Outcomes

JEL: J23, J24, J61, J62

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1 Introduction

When entering the labor market, many children choose to work in their parents' occupation.[1] Despite a long tradition of documenting this intergenerational persistence in occupational choice, the underlying mechanisms of this behavior are still not fully understood. Identifying the determinants of this persistence has important implications along several dimensions. First, occupational persistence is a major driver of income persistence and hence social mobility. Therefore, if society wants to improve social mobility, we need to understand the causes of occupational persistence. Second, high levels of occupational persistence may reflect an inefficient allocation of talent, as individuals may not be allocated to occupations based on their skills, but rather based on information networks or even nepotism. So what drives occupational persistence?

To answer this question, the literature has focused exclusively on supply-side effects, such as the transmission of abilities and parental information networks as mechanisms (Kramarz and Skans, 2014; Lo Bello and Morchio, 2022), assuming that children can freely choose which occupation to work in. In reality, however, children only find a job in a particular occupation if there is an employer looking for a worker in that occupation. Thus, the main contribution of this paper is to quantify the importance of demand-side effects. To do so, I use annual vacancy data for each combination of 400 regions and 436 occupations, based on all vacancies which are reported to the German Federal Employment Agency, about 600,000 per year. I show that conditioning on regional labor demand reduces the level of intergenerational persistence in occupational choice[2] by about 5 to 10 percent, the same order of magnitude as conditioning on children's years of education does. The importance of regional labor demand stems from two empirical observations. First, there is a high degree of regional heterogeneity in labor demand across occupations in Germany. Second, workers are highly immobile and many work in the same regional labor market as their parents.

The second contribution is to document that the level of persistence increases with the fineness of the classification of occupations and that the level of persistence is similar for different parent-child combinations. At the finest classification, the probability that a son works in a particular occupation increases by a factor of 17 and 24, if his mother or father works in that occupation, respectively. The third contribution is to show that children who follow into their parents' occupation experience a wage premium of about 6 percent during the first two years of

[1] This behavior is well documented in the literature. Examples include studies of specific occupations, such as doctors (Lentz and Laband, 1989) or pharmacists (Mocetti, 2016), aggregated occupational groups, such as liberal professions (Aina and Nicoletti, 2018), and entire countries, such as the United States (Blau and Duncan, 1967) or the United Kingdom (Lo Bello and Morchio, 2022).

[2] Throughout the paper, persistence is defined as the percentage increase in the probability of working in a given occupation if one's parent works in that occupation relative to someone whose parent does not work in that occupation. A more formal definition is provided in Section 2.

their first full-time job. Moreover, their annual unemployment risk is halved from about 7 to 3.5 percent during the first five years, and both effects disappear with job tenure.

Methodologically, this paper uses regional and occupation-specific vacancy shares as proxies for regional labor demand, by merging them with the German Socio-Economic Panel (SOEP). In total, I consider annual vacancy shares for each combination of 400 regions and 436 occupations, defined by the ISCO08 4-digit classification. This results in 174,400 different shares, calculated on the basis of all vacancies reported to the German Federal Employment Agency, about 600,000 per year. Assuming a logistic model, I first compute persistence levels without and then with conditioning on vacancy shares. Comparing both values gives a measure of the importance of regional labor demand for persistence in occupational choice. Intuitively, a miner's son growing up in Bottrop, a city in the industrial Ruhr area where 9.4 percent of full-time workers were employed as miners and quarriers in 2013, might become a miner not because of his father's information networks or the transmission of abilities but simply because the labor demand for miners in Bottrop is particularly high. This labor demand channel seems to be particularly relevant because this paper documents first a high degree of heterogeneity in regional labor demand for different occupations in Germany and second a low labor market mobility, as in my sample between 82 and 86 percent of full-time working children still live in the same region as their parents. To put the importance of regional labor demand into context, I repeat the same exercise but calculate the level of persistence conditional on the children's education level. In this way, I compare the regional labor demand channel to the education channel, which has been shown to be important for social mobility (Caucutt and Lochner, 2020; Heckman and Mosso, 2014). The finding that regional labor demand is a relevant channel for persistence is further supported by proxying regional labor demand with regional, occupation-specific employment shares, which is a more robust measure.

In addition to quantifying the importance of regional labor demand for persistence, this paper examines the impact of following into one's parents' occupation on wages and unemployment risk. Evaluating these effects for different subgroups with respect to the child's gender, education level, and tenure allows me to identify heterogeneous effects along these dimensions. First, the wage premium and the reduced unemployment risk for occupational followers disappear 2 and 5 years after labor market entry, respectively. Second, both effects are mainly driven by those individuals without a high school degree, suggesting that this subgroup particularly benefits from following, at least in the short run. Third, while daughters seem to benefit slightly more in terms of the initial wage premium, sons benefit more in terms of the reduced unemployment risk.

There are two strands of literature to which this paper relates. First, there are papers documenting that heterogeneity in local labor markets has important implications along several economic dimensions. It leads to workers in different areas earning different wages even after adjusting for the cost of living (Moretti, 2010) or facing different unemployment risks and

employment opportunities (Bilal, 2021; Kline and Moretti, 2013; Kuhn et al., 2021). Typically, these local differences are explained by agglomeration effects of productive firms in certain areas (Bilal, 2021) and by more efficient worker-firm matching (Dauth et al., 2022). This paper contributes to this literature by showing that local labor markets also play an important role for intergenerational persistence in occupational choice and hence for social mobility.

Second, there is a literature on how networks affect occupational decisions. Starting with the seminal work of Granovetter (1973) the literature has shown that networks (Brown et al., 2016; Dustmann et al., 2016; Glitz and Vejlin, 2021) and especially strong social ties, such as parents (Kramarz and Skans, 2014), are important for occupational choice. As a result, a substantial share of children follow into their parent's occupation (Aina and Nicoletti, 2018; Blau and Duncan, 1967; Lentz and Laband, 1989; Lo Bello and Morchio, 2022; Mocetti, 2016). While this following behavior is well established, the key underlying channels are much less clear. My paper contributes here on both the labor demand and the labor supply side. For the former, it is the first to document and quantify the importance of regional labor demand for intergenerational persistence in occupational choice. For the latter, it extends the supporting evidence in favor of a popular theory developed by Dustmann et al. (2016), which suggests that information networks rather than the transmission of abilities are the main driver of occupational persistence on the labor supply side, in two dimensions. First, I show that their model predictions of an initial wage premium for occupational followers that disappears with tenure are supported when followers are defined based on finely classified occupations rather than of firms. This definition is arguably more appropriate for studying the intergenerational transmission of abilities and skills, as they are likely to be occupation-specific, rather than firm-specific. Second, I show that their predictions still hold for the type of network that has been shown to be most important for labor market outcomes: immediate family members.

The remainder of this paper is structured as follows: Section 2 introduces the data and provides descriptive results before Section 3 describes the empirical strategy applied. Thereafter, Section 4 provides the empirical results, which are discussed, related to the literature, and supported by robustness checks in Section 5. Finally, Section 6 concludes.

2 Data and descriptive results

This section first introduces the different datasets used and the main definitions used in this paper. Thereafter, the data cleaning process is described and descriptive results are presented.

2.1 Data and Definitions

This paper uses two data sources. First, it uses data from the German Socio-Economic Panel (SOEP), wave 37, which covers the period from 1984 to 2020. The SOEP provides information

on labor market outcomes such as wages, occupations, and unemployment spells, as well as a large set of other socioeconomic variables. While the SOEP is representative at the national level, one drawback is that it is not representative at the county level. Therefore, to obtain representative regional, occupation-specific vacancy shares that will serve as proxies for regional labor demand, this paper additionally uses data from the German Federal Employment Agency (*Bundesagentur für Arbeit*, BA). This BA dataset contains annual vacancy and employment shares according to the ISCO-08 classification down to the 4-digit level. The vacancy shares are based on all vacancies reported to the BA between 2011 and 2020, about 600,000 per year, and the employment shares are computed based on all employees in Germany who are subject to mandatory social security contributions between 2013 and 2020, about 30 million employees per year. Merging this rich dataset with the SOEP allows controlling for regional and occupation-specific labor demand when studying intergenerational persistence in occupational choice.

To quantify the degree of occupational persistence, the most natural measure would be simply to calculate the percentage of children working in the same occupation as at least one of their parents.[3] However, looking only at percentages to quantify persistence has at least two important drawbacks. First, it ignores occupational concentration. If everyone worked in one occupation, the percentage share of followers would be equal to one, even though this high persistence may not be driven by actual following behavior. Second, it does not take into account differences in the distribution of children's and parents' occupations. For a given level of following, the percentage of followers will mechanically decrease if the distributions of the two subgroups differ substantially.

Both drawbacks are not present when using likelihood ratios instead of percentage shares. Therefore, following the definition typically used for diagnostic inference in medicine (Doi et al., 2022), I define the likelihood ratio of occupation j as

$$LR_j = \frac{P\left(o = j \mid o^P = j\right)}{P\left(o = j \mid o^P \neq j\right)}, \tag{1}$$

where o and o^P refer to the child's and parent's occupation, respectively.[4] Thus, the likelihood ratio of occupation j is given by dividing the probability of a child working in occupation j if the parent works in that occupation by the probability of doing so if the parent does not work in that occupation. In the context of the medical literature, we can think of children whose parents work in occupation j as treated, and children whose parents do not work in occupation j as untreated. Hence, the goal is to compare the "risk" of working in occupation j between these two subgroups. Intuitively, a likelihood ratio of 1 indicates that children's

[3] Table 9 in the Appendix presents these statistics.

[4] Dal Bó et al. (2009) use a similar measure which they call *dynastic bias*which is defined as the conditional probability of a father working in a given occupation if the son works in that occupation, divided by the unconditional probability of a father working in that occupation.

occupations are independent of their parents' occupations, while a ratio of 2 implies that the probability of working in a given occupation is doubled if one has a parent working in that occupation compared to someone whose parent does not work in that occupation. This definition differs slightly from the one used by Lo Bello and Morchio (2022), who divides the conditional probability of working in a given occupation if a parent works in that occupation by the unconditional probability of working in that occupation.

To obtain an aggregate measure of persistence, the likelihood ratios are weighted by the number of children working in each occupation. Formally, the weighted likelihood ratio is defined as

$$WLR = \sum_{j=1}^{J} w_j LR_j \tag{2}$$

where J is the number of different occupations and the weights w_j are based on the number of children working in occupation j and are defined as

$$w_j = \frac{n_j}{N} \tag{3}$$

where N and n_j refer to the total sample size and the number of children working in occupation j, respectively.

In addition to the likelihood ratios, this paper will refer to the excess probability as a measure of persistence, which is defined by subtracting one from the likelihood ratios. Intuitively, the excess probability indicates the percentage increase in the probability of working in a given occupation if one's parents work in that occupation relative to someone whose parents do not work in that occupation.

2.2 SOEP - Descriptive Results

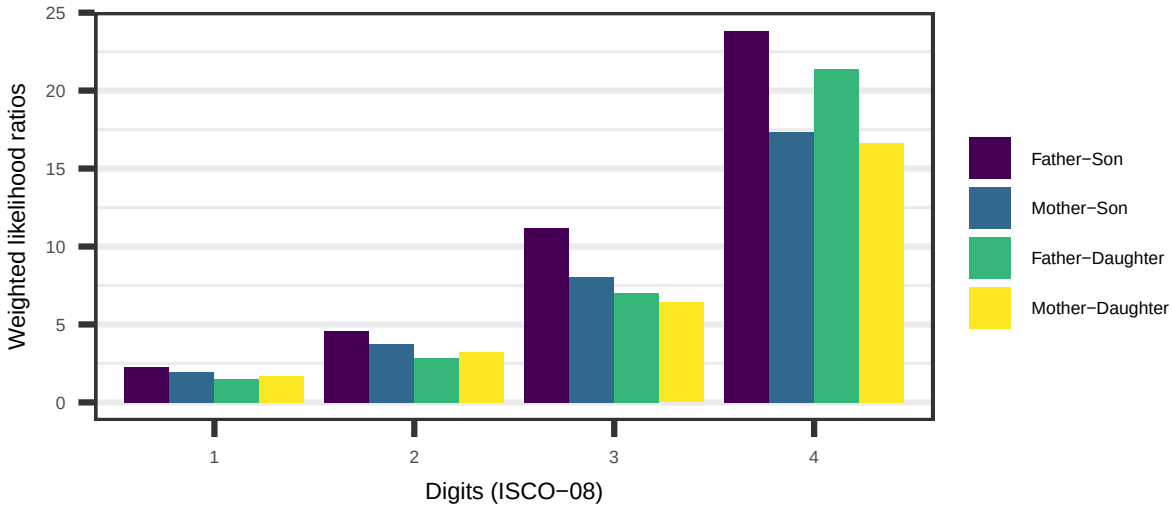
From the total sample size of 742,822 person-year observations, I drop those who are not in the relevant age group, that is, those under 16 and over 65, and those who are not in the labor force, such as students or individuals caring for children or the elderly, leaving 490,535 person-year observations.[5] Since I am interested in intergenerational links, I keep only those individuals who have a parent in this subsample, leaving 107,524 observations. Finally, I drop all individuals whose parents do not have information on their occupation, resulting in a baseline dataset of 78,089 observations. Furthermore, for the analysis of regional labor demand, I can only use SOEP data from 2011 onward because vacancy rates are only available from 2011 to 2021, which results in 28,620 person-year observations. For aspects that do not require regional information, the basic SOEP sample is used.

[5] Tables 7 and 8 in the Appendix list the different steps in a table.

Splitting the baseline SOEP sample by gender reveals that sons account for about 56 percent and are thus slightly overrepresented. Note that children are followed up until their parents retire. Thus, some children may have started their own families during this period, which could be a reason for the underrepresentation of daughters, as they are more likely to leave the labor market after starting their own families. Robustness checks are conducted focusing only on those children who are still living in the same household as their parents, because parent-child ties are likely to be stronger for this subgroup.[6]

Figure 1 plots the weighted likelihood ratios according to the ISCO-08 classification[7] for all four parent-child combinations and levels of occupational disaggregation, respectively.[8] The ISCO-08 classification includes 10, 43, 130, and 436 different occupations for the digit levels 1 to 4.

Figure 1: Weighted likelihood ratios of occupational followers



Notes: Weighted likelihood ratios are computed according to Equation (2) including the period from 1984 to 2020.

This figure clearly indicates that persistence increases in the fineness of classifying occupations. The purple bar on the very left for example shows that sons were around 2.5 times as likely to work in a given occupation, defined at the 1-digit level, if their father also worked in this occupation relative to a son whose father worked in another occupation.[9] Examples of this

[6]This subgroup amounts to 43,823 child-year observations and thus includes about 55 percent of the baseline sample.

[7]The SOEP data provides occupational information according to the ISCO-08 classification only from 2012 on. Prior to 2012 it provides this information based on the ISCO-88 classification, which I have translated into the ISCO-08 classification based on schemes provided by the International Labour Organization.

[8]The exact numbers can be found in Tables 14 and 15 in the Appendix.

[9]Tables 12 and 13 in the Appendix depict the likelihood ratios for each occupation defined at the 1-digit level separately.

broad level of disaggregation are the categories of *Legislators, senior officials, and managers* or *Craft and related trades workers*. For the finest level of classification, sons were more than 23 times as likely to work in a given occupation if their father worked in this occupation. Examples for this level of disaggregation are occupations like *Dentists*, *Roofers* or *Miners and Quarriers*. So moving from classifications of 1-digit to 4-digit increases persistence measured by weighted likelihood ratios by a factor of 10.

In addition, there is a relatively high level of homogeneity in persistence across parent-child combinations. At the finest level of classification, the probability of sons and daughters working in a given occupation increases by factors of 24 and 21, respectively, if the father works in that occupation. For mothers, the corresponding factors are 17 and 16. Furthermore, while persistence is highest for father-son pairs at all levels of occupational disaggregation, there is no clear ranking for the remaining three pairs and the differences are not sizeable. Interestingly, these levels of persistence are not driven by self-employment as Table 11 in the Appendix shows.

To compare these values with those documented by Lo Bello and Morchio (2022) for fathers and sons in the United Kingdom between 1991 and 2008, three adjustments need to be made. In addition to changing the definition of likelihood ratios by dividing by the unconditional probability of a son/daughter working in a given occupation, I follow their assumptions and exclude soldiers and classify unemployed individuals according to the occupation of their next job. This yields a weighted likelihood ratio of 2.39 for father-son pairs at the 1-digit level, which is still considerably larger than the 1.72 documented in Lo Bello and Morchio (2022), suggesting a relatively high persistence in occupational choice in Germany.[10]

2.3 BA data - Descriptive Results

To include information on regional labor market characteristics, I merge the SOEP data with regional and occupation-specific employment and vacancy shares provided by the German Federal Employment Agency (*Bundesagentur für Arbeit*, BA). This dataset provides annual employment and vacancy shares for 400 German regions and occupations based on the ISCO-08 classification down to the 4-digit level. This finest level of disaggregation includes 436 different occupations and thus provides me with 174,400 shares. The annual vacancy shares are calculated based on all vacancies reported to the BA, about 600,000 per year, while the employment shares are calculated based on all employees who are subject to mandatory social insurance contributions, about 30 million individuals per year. Since vacancy shares are potentially a very volatile proxy for regional labor demand, I conduct checks using employment shares, which are a more robust measure.

[10]Table 10 in the Appendix shows all weighted likelihood ratios after these adjustments. Unfortunately, the value for father-son pairs at the 1-digit classification is the only number that can be compared, since Lo Bello and Morchio (2022) only consider father-son pairs, define the 2-digit level slightly finer, and do not have data for finer classifications.

In order for regional labor demand to play a role in intergenerational persistence of occupational choice and hence for social mobility, two conditions must be met. First, there must be some heterogeneity in regional labor demand for different occupations across Germany because otherwise regions would be irrelevant for occupational choice. Second, a large share of children need to live in the same regions as their parents so that they face the same labor demand.

Figure 2: Occupation with highest vacancy rate in 2020 (ISCO-08, 2-digit)

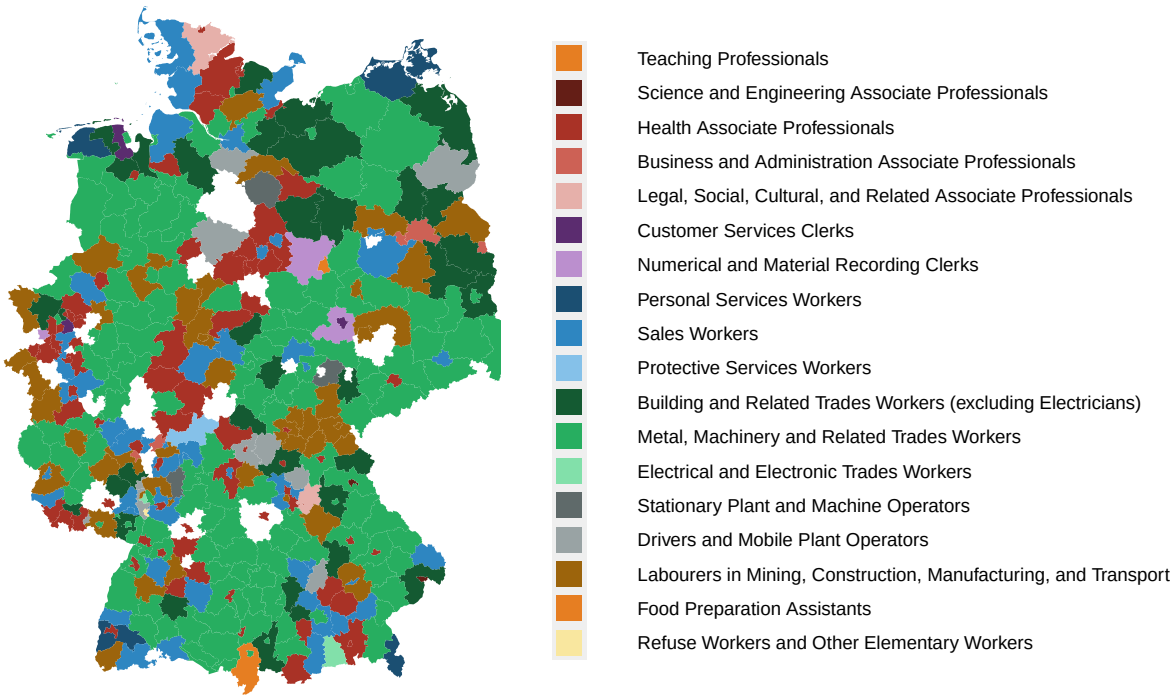


Figure 2 shows the occupation with the highest number of vacancies, defined at the ISCO-08 2-digit level, for each region in Germany in 2020. Of all 43 occupations in this classification, 18 have the highest number of vacancies in at least one region. One aspect that becomes visible in this figure are the different mining locations in Germany, being colored in brown. For example, in the far west the Rhenish coal district is easily detectable. Thus, depending on the region where one lives, the regional labor demand for a given occupation can differ substantially. Therefore, there is considerable heterogeneity in regional labor demand across Germany, satisfying the first condition.

Regarding the second condition, I find that, depending on the parent-child combination, between 82 and 86 percent of children in my sample live in the same region as their parents. This finding that workers are immobile, especially when they have family ties in a given region, is

consistent with what the literature has shown (Huttunen et al., 2018). Combining the high level of regional heterogeneity in labor demand across Germany with the immobility of workers suggests that regional labor demand potentially plays an important role in occupational choice, and thus social mobility. Intuitively, the son of a coal miner in a coal region might become a coal miner himself not because of his father's occupation, but simply because it is the predominant occupation in that region.

3 Empirical Strategy

This section outlines the empirical strategies used to quantify the relevance of regional labor demand for occupational persistence as well as to study the impact of following into one's parents' occupation on wages and unemployment risk .

3.1 Importance of regional labor demand for persistence

To quantify the importance of regional labor demand for intergenerational persistence in occupational choice, I compute weighted likelihood ratios conditional on regional and occupation-specific vacancy shares using a logistic model. More formally, the regression reads

$$logit(\mathbb{1}(o_{i,t} = j)) = \alpha + \beta_1 \mathbb{1}(o^P_{i,t} = j) + \beta_2 \theta_{i,t} + \epsilon_{i,t}, \tag{4}$$

where $\mathbb{1}(o_{i,t} = j)$ and $\mathbb{1}(o^P_{i,t} = j)$ are functions indicating whether child i and its parent work in occupation j in year t, respectively. $\theta_{i,t}$ is the vacancy share of occupation j in the region where children i lives in year t.[11] By running these regressions, I am able to compute the predicted values of working in a particular occupation, conditional on the parent's occupation and the regional occupation-specific vacancy share.

Thus, the likelihood ratio of occupation j conditional on the regional labor demand is formally

$$LR^{vac}_j = \frac{P\left(o = j \mid o^P = j, \theta\right)}{P\left(o = j \mid o^P \neq j, \theta\right)}, \tag{5}$$

isolates the part of persistence that is independent of regional labor demand. A prominent example would be parental information networks or the transmission of abilities. Comparing the conditional and unconditional weighted likelihood ratios gives a measure of how important regional labor demand is for persistence. Formally, the percentage reduction in persistence after

[11] As I compute likelihood ratios separately for each of the four parent-child combinations, I am also account for potential gender differences.

conditioning on regional labor demand is given by

$$\theta^{share} = \frac{WLR - WLR^{vac}}{WLR - 1}. \tag{6}$$

Thus, θ^{share} describes the percentage reduction in persistence after conditioning on regional labor demand.

To put this number in context, I repeat the same exercise but now quantify the importance of children's education level on persistence. Education was chosen as a comparison because the literature has shown it to be a key determinant of intergenerational persistence. Similarly to before, I define the share of persistence generated by education as

$$educ^{share} = \frac{WLR - WLR^{educ}}{WLR - 1}. \tag{7}$$

where WLR^{educ} is computed by weighting

$$LR_j^{educ} = \frac{P\left(o = j \mid o^P = j, e\right)}{P\left(o = j \mid o^P \neq j, e\right)}, \tag{8}$$

where e is the level of education of the children, measured in years of education.

3.2 Impact of following on wages

In addition to quantifying the impact of regional labor demand on persistence, I also document how following one's parents' occupation affects labor market outcomes. In particular, I provide evidence on the impact on actual gross hourly wages and the annual risk of becoming unemployed for all parent-child combinations and years since the first full-time job. To identify the impact of working in the same occupation on wages, I run the following regression

$$log(wage_{i,t}) = \alpha + \beta follower_{i,t} + \gamma X_{i,t} + \epsilon_{i,t},$$

where $wage_{i,t}$ is the actual gross hourly wage and $follower_{i,t}$ is an indicator function that is equal to one if child i works in the same occupation as at least one of its parents in period t. Since the SOEP data provides information on occupational according to the ISCO-08 classification only since 2013, while it provides information according to the ISCO-88 classification from 1984 to 2017, occupations are defined according to the latter using the 4-digit classification. X is a set of control variables consisting of a third-order age polynomial, gender, marital status, years of education, region, migration background as well as a second-order tenure polynomial, the

firm size, and survey year. Importantly, X also includes the occupation.[12] Thus, the estimated coefficients hold within occupations. Since I do not use the BA data for this regression, I can use the full SOEP baseline sample.

In order to focus on children's first major job and to abstract from possible smaller vacation or college jobs, I follow a strategy similar to that proposed by Topel and Ward (1992). While they define labor market entry as the first quarter in which earnings exceed 70 percent of the minimum wage for full-time work since the following four quarters also meet this condition, I have to deviate slightly because Germany only introduced its first statutory minimum wage in 2015. Thus, I define labor market entry as the first year in which individuals work full-time given that they continue to do so in the following year.

3.3 Impact of following on unemployment risk

In addition to wage differences, I also examine whether following one's parents' occupation affects the probability of becoming unemployed. To do so, I run the following regression

$$\mathbb{1}(u_{i,t+1} = 1) = \alpha + \beta follower_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \quad \text{if} \quad \mathbb{1}(e_{i,t} = 1),$$

where $\mathbb{1}(u_{i,t+1} = 1)$ and $\mathbb{1}(e_{i,t} = 1)$ indicate individuals who are full-time employed in period t but become unemployed in the following period, $t + 1$. As before, $follower_{i,t}$ is equal to one if children i works in the same occupation as at least one of its parents, and $X_{i,t}$ is the same set of control variables as in the wage regression. Thus, β describes the effect of working full-time in the same occupation as at least one parent on the probability of being unemployed in the next period relative to someone working full-time in a different occupation.

4 Results

This section presents the empirical results. First, it quantifies the relevance of regional labor demand for intergenerational persistence in occupational choice, before studying how children with and without parents working in the same occupation differ in terms of hourly wages and unemployment risk.

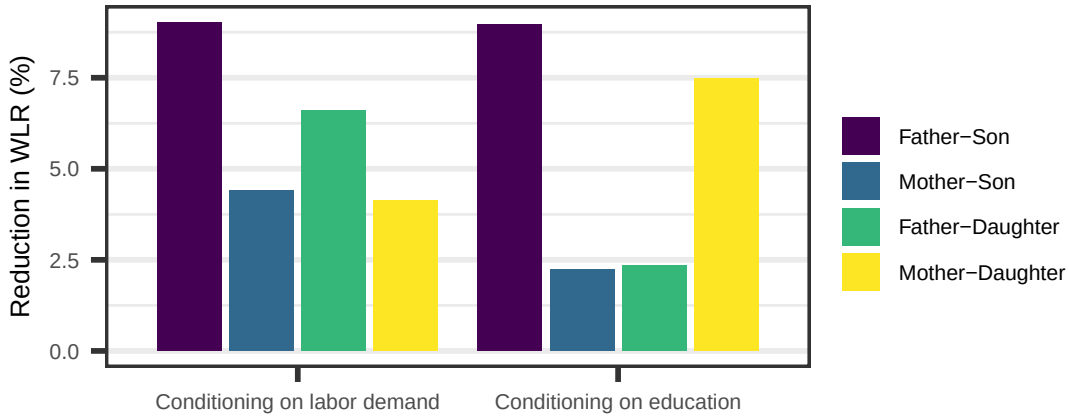
4.1 Importance of regional labor demand for persistence

Figure 3 shows the percentage reductions in persistence after conditioning on regional labor demand and education, as defined in equations (6) and (7). Conditioning on regional labor

[12] This set of control variables is the same as the one used in Lo Bello and Morchio (2022), except that I exclude smoking behavior due to data limitations.

demand, proxied by regional and occupation-specific vacancy shares, reduces persistence by about 5 to 10 percent. Conditioning on education, measured in years of schooling, generates persistence levels of a similar magnitude. It seems to be particularly important for father-son pairs, explaining about 9 percent. This result suggests that regional labor demand is a relevant factor for occupational persistence and thus for social mobility. But it also shows that most of the persistence is due to other characteristics, possibly information networks.

Figure 3: Reduction in WLRs after conditioning on regional labor demand and education



Notes: For this figure, occupations are defined at the 4-digit level. As vacancy data is only available from 2011 onward, I also restrict the analysis for education on this subsample to guarantee comparability.

4.2 Impact of following on wages

Table 1 shows the impact of working in the same 4-digit occupation as at least one parent on the actual gross hourly wages, depending on the time horizon since the first full-time job. Occupational followers have a significant wage premium of about 5.6 percent in the first two years, which disappears thereafter. As the average actual gross hourly wage for this period and subgroup was around 10 Euros, this premium translates into a higher hourly wage of around 50 cents. This means that the monthly and annual gross income of the occupational followers is about 80 and 1,000 Euros higher, respectively. Splitting the sample by education into those with a high school diploma and those without, the coefficients indicate that the wage premium is almost entirely driven by the less educated subsample, which has a highly significant initial wage premium of about 8 percent. Finally, looking at sons and daughters separately shows that the effect appears to be slightly stronger for daughters.

Table 1: Impact of following on gross hourly wages

Specification	N	Coefficient				
		All	No HS	HS	Sons	Daughters
First 2 y. after first FT job	11,551	0.056**	0.082***	0.032	0.052	0.068*
		(0.025)	(0.031)	(0.038)	(0.032)	(0.039)
2 - 5 y. after first FT job	9,468	-0.018	0.011	-0.016	-0.035	0.046
		(0.026)	(0.060)	(0.027)	(0.035)	(0.041)
6 - 10 y. after first FT job	9,644	-0.020	0.121	-0.041	-0.048	0.047
		(0.025)	(0.076)	(0.027)	(0.034)	(0.034)
$>$ 10 y. after first FT job	11,056	0.011	0.069	0.004	0.021	0.027
		(0.017)	(0.065)	(0.017)	(0.020)	(0.026)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on actual gross hourly wages. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the periods 1984 to 2012 and 2013 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

4.3 Impact of following on unemployment risk

Table 2 shows the results with respect to unemployment risk. Occupational followers have a significantly lower risk of becoming unemployed in the first five years after their first full-time job. Given that the average probability of becoming unemployed for this group is 5 percent, the reduction of 2.2 percentage points almost halves the unemployment risk for children.

Table 2: Impact of following on unemployment risk

Specification	N	Coefficient				
		All	No HS	HS	Sons	Daughters
First 2 y. after first FT job	9,708	-0.021***	-0.032***	-0.017**	-0.027***	-0.013
		(0.007)	(0.012)	(0.009)	(0.009)	(0.012)
2 - 5 y. after first FT job	7,814	-0.022***	-0.039*	-0.021***	-0.033***	-0.007
		(0.006)	(0.020)	(0.006)	(0.008)	(0.012)
6 - 10 y. after first FT job	8,461	-0.006	0.000	-0.005	-0.019*	0.002
		(0.008)	(0.019)	(0.009)	(0.011)	(0.014)
$>$ 10 y. after first FT job	9,552	-0.006	-0.043	0.001	-0.006	-0.008
		(0.009)	(0.034)	(0.009)	(0.012)	(0.014)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on the probability of becoming unemployed the following year. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the periods 1984 to 2012 and 2013 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Splitting the sample by education, again shows that those without a high school degree benefit the most from following, as their unemployment risk decreases by 3.2 to 3.9 percentage points.

The average unemployment risk for this group is about 7 percent. While daughters seem to benefit more from following in terms of wages, sons benefit more in terms of unemployment risk. While for daughters the risk decreases only insignificantly, for sons the annual unemployment risk is reduced by about 3 percentage points.

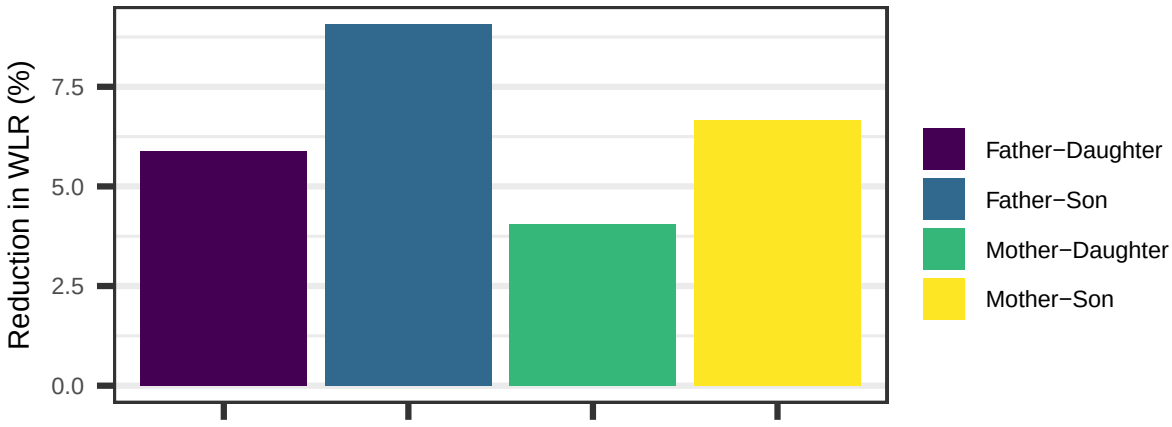
5 Robustness checks and discussion

In order to examine the robustness of my results, several checks are conducted in this section. A short discussion of the implications of these results follows.

5.1 Robustness checks

To ensure the plausibility and robustness of my main results, I conduct several checks. First, with respect to quantifying the importance of regional labor demand for persistence, I repeat the same exercise described in Section 3.1 but now I condition on employment rather than of vacancy shares. The idea is that vacancy shares may be an imperfect measure of contemporaneous labor demand, as they are volatile and may not reflect actual labor market opportunities in a given occupation. Employment shares, on the other hand, are a much more stable measure and thus complement vacancy shares as a proxy for labor demand. Figure 4 shows the resulting percentage reductions in persistence. For all four parent-child pairs, the reductions are very similar to those found using vacancy shares, supporting the robustness of my main result.

Figure 4: Reduction in WLRs after controlling for employment shares



Notes: For this figure, occupations are defined at the 4-digit level. As employment data is only available from 2013 onward, this analysis is restricted to this subsample.

To further investigate the effect of following one's parents' occupation, I perform two checks. First, to check the robustness of the results, I exclude all children of self-employed parents, as the wage premium and reduced unemployment risk could be driven by the self-employed employing their own children. However, Tables 3 and 4 show that this is not the case. In fact, excluding the children of the self-employed increases the initial wage premium for followers to 7.1 percent and becomes significant at the 1 percent level. Interestingly, the effect is slightly reduced for children without a high school diploma, while the effect is stronger for those with a high school diploma. This observation may indicate that children with lower educational attainment earn higher wages when working for self-employed parents, while the opposite is true for children with higher educational attainment. There are no significant changes in the reduction of the risk of unemployment.

Table 3: Impact of following on wages without children of self-employed

Specification	**N**	**Coefficient**				
		All	**No HS**	**HS**	**Sons**	**Daughters**
First 2 y. after first FT job	10,261	0.071***	0.065**	0.071*	0.065*	0.089**
		(0.025)	(0.032)	(0.038)	(0.034)	(0.038)
2 - 5 y. after first FT job	8,145	-0.002	-0.032	0.021	-0.012	0.046
		(0.024)	(0.050)	(0.026)	(0.034)	(0.036)
6 - 10 y. after first FT job	7,975	0.018	0.064	0.006	0.013	0.049
		(0.021)	(0.064)	(0.022)	(0.028)	(0.032)
$>$ 10 y. after first FT job	9,127	0.020	0.075	0.015	0.044**	0.020
		(0.016)	(0.050)	(0.016)	(0.019)	(0.025)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on actual gross hourly wages excluding children of self-employed. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the time spans 1984 to 2017 and 2018 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 4: Impact of following on unemployment risk without children of self-employed

Specification	**N**	**Coefficient**				
		All	**No HS**	**HS**	**Sons**	**Daughters**
First 2 y. after first FT job	8,460	-0.017**	-0.028**	-0.013	-0.028**	-0.008
		(0.008)	(0.014)	(0.010)	(0.011)	(0.014)
2 - 5 y. after first FT job	6,618	-0.020***	-0.022	-0.023***	-0.029***	-0.007
		(0.007)	(0.024)	(0.006)	(0.010)	(0.013)
6 - 10 y. after first FT job	6,884	-0.002	0.008	-0.001	-0.007	0.003
		(0.010)	(0.023)	(0.013)	(0.014)	(0.017)
$>$ 10 y. after first FT job	7,718	0.004	-0.030	0.009	0.008	-0.001
		(0.011)	(0.040)	(0.011)	(0.014)	(0.017)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on the probability of becoming unemployed next year excluding children of self-employed. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the periods 1984 to 2012 and 2013 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Second, to check the plausibility of the result, I restrict the sample to only those children still living in their parents' household. This subset consists of more than 52,000 child-year observations, or about 55 percent of the initial sample. The idea is that these children are likely to have a closer relationship with their parents, and if parental information networks rather than the transmission of innate abilities are the main driver of persistence, we would expect stronger results. Tables 5 and 6 show that this is indeed the case. The initial wage premium rises to 6.8 percent and becomes significant at the one percent level, supporting the plausibility of the results presented. While the impact on the unemployment risk hardly changes in the first two years, it becomes stronger in years two to five, rising from 2.2 to 3.2 percentage points. Interestingly, the difference in impacts for sons and daughters also increases, suggesting that the unemployment risk decreases by 5.1 percentage points for the former and by 1.4 percentage points for the latter during this period. This finding that the effects of following one's parents' occupation become stronger when the parent-child relationship is closer also supports a theory of parental information networks rather than the transmission of innate abilities.

Table 5: Impact of following on wages - only children living in parents' household

Specification	N	Coefficient				
		All	No HS	HS	Sons	Daughters
First 2 y. after first FT job	10,294	0.068***	0.079***	0.061	0.056*	0.097**
		(0.023)	(0.028)	(0.038)	(0.031)	(0.038)
2 - 5 y. after first FT job	6,413	-0.001	0.033	-0.002	-0.028	0.059
		(0.030)	(0.056)	(0.035)	(0.041)	(0.046)
6 - 10 y. after first FT job	3,506	-0.054	0.038	-0.081*	-0.056	0.046
		(0.038)	(0.077)	(0.046)	(0.046)	(0.047)
> 10 y. after first FT job	2,680	-0.009	0.032	-0.023	-0.006	-0.041
		(0.043)	(0.081)	(0.053)	(0.054)	(0.080)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on actual gross hourly wages for the subgroup of children who live in their parents' household. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the time spans 1984 to 2017 and 2018 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 6: Impact of following on unemployment risk - only children living in parents' household

Specification	N	Coefficient				
		All	No HS	HS	Sons	Daughters
First 2 y. after first FT job	8,567	-0.020***	-0.033***	-0.014	-0.027***	-0.010
		(0.008)	(0.012)	(0.011)	(0.010)	(0.014)
2 - 5 y. after first FT job	5,179	-0.032***	-0.067***	-0.023***	-0.051***	-0.014
		(0.007)	(0.021)	(0.008)	(0.009)	(0.017)
6 - 10 y. after first FT job	2,955	-0.005	-0.041	-0.000	-0.013	0.033
		(0.016)	(0.028)	(0.022)	(0.017)	(0.043)
> 10 y. after first FT job	2,124	0.005	-0.046	0.027	-0.033	0.115
		(0.038)	(0.069)	(0.048)	(0.043)	(0.085)

Notes: This figure shows the effect of working in the same occupation as at least one of the parents on the probability of becoming unemployed next year for the subgroup of children who live in their parents' household. Occupations are defined according to the ISCO-88 4-digit and the ISCO-08 4-digit classifications for the periods 1984 to 2012 and 2013 to 2020, respectively. Standard errors are clustered at the individual level and shown in brackets.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

5.2 Discussion

The main result, that regional labor demand is an important driver of intergenerational persistence in occupational choice and thus social mobility, has potentially important implications for the discussion of the substantial decline in interstate mobility in the United States over the past few decades (Kaplan and Schulhofer-Wohl, 2017; Molloy et al., 2011; Molloy et al., 2017). While about 3 percent of Americans moved between states each year in 1990, that number fell by half over the next 30 years (Kaplan and Schulhofer-Wohl, 2017). At least two prominent causes for this decline have been proposed in the literature, which have different implications for

my main result in this discussion. On the one hand, (Kaplan and Schulhofer-Wohl, 2017) argued that interstate mobility declined because the geographic specificity of returns to occupations declined and the ability of workers to learn about other locations before moving increased. According to this argument, lower regional mobility does not imply lower social mobility because as labor markets become more equal, social advancement is possible even without regional mobility. On the other hand, Cooke (2013) found that the decline in migration is correlated with more people living in dual-earner households, which may have made households less mobile. If this channel dominates, and if my results hold for the United States, then the decline in regional mobility translates into lower social mobility. Thus, a fruitful avenue for future research might be to examine whether my results generalize to other countries, particularly the United States, and what the consequences of lower regional mobility are for social mobility in the United States.

The results on the impact of following one's parents' occupation are qualitatively and quantitatively very similar to what has been found in the context of referrals more generally (Brown et al., 2016; Burks et al., 2015; Dustmann et al., 2016; Glitz and Vejlin, 2021). For example, using extensive Danish administrative data, (Glitz and Vejlin, 2021) show that workers who find their jobs through referrals from former colleagues initially earn 4.6 percent higher wages and are 2.3 percentage points less likely to leave their firm in the first year. They rationalize this finding with a learning model established in Jovanovic (1979) and further developed in Simon and Warner (1992) and Dustmann et al. (2016). In this model, firms can hire new employees through either the external or the referral market. The core idea is that for those hired through the latter, uncertainty about match-specific quality is lower because referrals provide information that the firm and the worker would not otherwise have. Since workers are partially insured against low realizations of their productivity by simply leaving the firm, potential wage growth is higher for workers hired through the external market. Consequently, referral hires have higher reservation wages and reject wage offers that identical external hires would accept, resulting in an initial wage premium for referral hires. Moreover, this subgroup is on average better matched. As uncertainty about the match-specific quality dissipates over time, workers with low productivity realizations separate from the firm, resulting in a higher unemployment risk for those hired via the external market, and both the wage premium and the differences in unemployment risk disappear with tenure.

Not only do my results replicate these model predictions, but the finding that the effect of following is particularly strong for children without a high school degree is also very consistent with this theory. Because less educated individuals have fewer degrees and certificates as a signal of their ability, uncertainty about the quality of the match is likely to be higher, and thus the effect of parental information is likely to be stronger. Thus, my results are consistent with the predictions of the model and extend the evidence in two dimensions. First, unlike the previous supporting literature, which defines following based on working in the same firm (Brown et al.,

2016; Burks et al., 2015; Dustmann et al., 2016; Glitz and Vejlin, 2021), this paper defines following based on working in the same finely classified occupation. This broader definition of following has two advantages. First, it allows for the consideration of parental networks beyond a particular firm, which may be particularly relevant for Germany with its large number of small craft firms. Second, it is better suited to studying the intergenerational transmission of skills and abilities, which are likely to be occupation-specific rather than firm-specific. The second, and probably more important, dimension in which this paper extends the empirical evidence in favor of the theory developed in (Dustmann et al., 2016) is that it examines intergenerational occupational following behavior and thus the type of social network that has been shown to be most important for individual labor market outcomes: immediate family members (Eliason et al., 2022).

The fact that my results are not only qualitatively but also quantitatively very similar to those found by Glitz and Vejlin (2021) for former coworkers further suggests that genes, and thus the transmission of innate abilities, are not of first order importance for subsequent behavior. But even if we agree that parental information networks are the main driver of persistence, the welfare consequences are not clear. On the one hand, the literature on referrals generally models this channel as welfare improving by reducing initial uncertainty about match-specific quality. For example, Dustmann et al. (2016) estimate that referrals increase aggregate welfare in the economy by 0.62 percent by providing additional information. On the other hand, Lo Bello and Morchio (2022) model parental information networks more as a form of nepotism that results in children not working in the occupation in which they have a competitive advantage. They find that shutting down parental networks increases welfare by 0.3 percent in consumption-equivalent variation. Therefore, an interesting avenue for future research could be to combine both channels in a structural model and study the resulting impact of persistence on welfare.

6 Conclusion

In this paper, I study the mechanisms behind the empirical observation that many children follow their parents into the labor market. In particular, I quantify how much of the persistence can be explained by a channel that has so far been abstracted from the literature: regional labor demand. For this purpose, I merge regional and occupation-specific annual vacancy shares, computed on the basis of all vacancies reported to the German Federal Employment Agency, with the German Socio-Economic Panel (SOEP).

I find that controlling for regional labor demand, proxied by these vacancy shares, reduces persistence by up to 10 percent when classifying occupations at the finest level. This effect is of the same magnitude as controlling for children's education and suggests that regional labor demand is of substantial importance for occupational persistence and thus social mobility. Furthermore, I document that the degree of occupational persistence is relatively homogeneous

across parent-child pairs. A child is about 20 times more likely to work in a given occupation if its parent works in that occupation than a child whose parent works in a different occupation. Finally, I show that children who join their parents' occupation experience a wage premium of about 6 percent during the first two years of their first full-time job. Their annual unemployment risk is also halved during the first five years. Both results are driven primarily by individuals without a high school degree. These results are qualitatively as well as quantitatively very similar to what has been found for referrals based on minority groups (Dustmann et al., 2016) and former coworkers (Glitz and Vejlin, 2021), supporting the learning model developed in Dustmann et al. (2016). Thus, the transmission of innate abilities does not seem to be of first order importance, but rather parental information networks and regional labor demand are the main drivers of children's subsequent behavior.

There are at least two promising avenues for future research. First, it would be interesting to see whether the empirical results found in this paper hold in other countries. In particular, the case of the United States would be interesting, as it could shed new light on the decline in interstate migration observed over the past 40 years. Second, since parental networks, along with regional labor demand, appear to be the main drivers of persistence in occupational choice, a more detailed modeling of this channel, focusing in particular on its impact on the allocation of talent, may provide new insights. So far, it has been modeled either exclusively as improving efficiency by reducing match-specific uncertainty, as in Dustmann et al. (2016), or exclusively as degrading efficiency as a form of nepotism, as in Lo Bello and Morchio (2022). Incorporating both channels into a structural model can thus provide new insights into the relative importance of both effects.

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