Occupational downgrading of Venezuelan migrants in Colombia: Do work permits improve occupational mobility?

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Abstract

Immigration policies prioritize labor market integration, aiming for high employment rates and leveraging migrant skills to enhance host country productivity. However, migrants often face entry barriers and human capital misallocation. This article examines the occupational downgrading of Venezuelan migrants in Colombia and assesses the impact of work permit policies on mitigating this trend. Our empirical findings highlight significant occupation downgrading, prompting an exploration of the role of work permits. The analysis indicates that permits have expanded employment prospects for migrants who were previously unemployed or engaged in blue-collar jobs, mainly for females and the youngest population. While permits do not significantly reduce occupation downgrading they are associated with more formal job search mechanisms. Moreover, our findings show no significant impact of work permits on the intensity of routinization; instead, there is an increase in the intensity of non-routine analytic and interactive tasks among the youngest workers. This suggests that permits could be complemented with additional instruments to enhance migrant matching in the labor market.

Keywords: Migration, occupational downgrading, labor mobility, work permits.

JEL Codes: F22, O15, J24, J61

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1 Introduction

The socioeconomic and political conditions in Venezuela have led to the most significant migration exodus in Latin American and global history. Between 2015 and 2019, around 5 million Venezuelans migrated to neighboring countries such as Colombia, Peru, Ecuador, Chile, Brazil, and Argentina (Wolfe, 2021b). Colombia has been one of the primary destinations hosting around 2.5 million Venezuelan immigrants at the beginning of 2022 (National Planning Department, 2022). Migrants face significant barriers to entering the labor market, which is a primary concern of destination countries. Barriers such as language, discrimination, xenophobia, lack of networks, and institutional and legal restrictions, among others have been identified (see Danzer and Dietz, 2014; Męczyński, 2016; Liu et al., 2019). Integration into the labor market goes beyond reducing the unemployment rate or the wage gaps of migrants, in the medium term, reducing the misallocation of human capital can generate productivity gains. Otherwise, this triggers occupational degradation, i.e., the loss of occupational status between the job that the migrant had in the country of origin and the job in the receiving country (Crollard et al., 2012; Chiswick and Miller, 2009; Simón et al., 2014; Akresh, 2008).

Since 2018, the Colombian government has issued residence permits to Venezuelan migrants, serving as valid identification documents. These permits include labor authorization and grant access to social services, such as education and healthcare. According to Migration Pulse Survey (EPM, for its acronym in Spanish), 315,000 work permits, constituting 16.58% of the Venezuelan migrant population in Colombia, have been allocated. Previous studies like Bahar et al. (2021) have shown that these permits had non-significant effects on the labor market outcomes of the host population but small and negative (positive) effects on the formal employment of Colombian (Venezuelan) workers. They find that the effects on Colombian workers are mainly concentrated on the female and highly educated population. Others, like Shamsuddin et al. (2021) and International Labour Organization (2023), have found that even when work permits are relatively easy to obtain in Brazil, Venezuelan migrants have faced downgrades in grades

at school and occupations at work in this country.

To the extent that permits facilitate access to the labor market, positive effects can be expected in improving the matching of migrant workers. Therefore, considering that mobility generates an interruption in the work trajectory of migrants, it is relevant to study how occupations change between origin and destination, identifying the level of occupational degradation and whether integration policies such as how work permits could shape these occupational changes. Moreover, factors reducing occupational degradation are important to the design of migration policies, specifically those focused on improving their employment outcomes and reducing the misallocation of human capital (*skill waste*), as the International Labour Organization (2023) and Gunawan et al. (2022) indicate.

In this paper, we analyze the occupational transition patterns of migrants between origin and destination, i.e., we study whether migrants change their occupation (employed, unemployed, or out of the labor force). Particularly, we analyze to what extent it is affected by having a work permit. Additionally, in this analysis, we measure occupational degradation through the analysis of different types of occupations which we classify between white-collar and blue-collar occupations. For this, we exploit a unique database, the EPM survey, a longitudinal database that allows us to identify the occupation of migrants before and after migrating to Colombia.

Also, we employ a difference-in-difference approach combined with an inverse probability weighting to face endogeneity concerns related to the fact that the work permits are not randomly assigned and compare individuals with and without work permits. Likewise, considering that the results may be conditional to individual characteristics, we estimate the heterogeneous effects by gender and age groups. Using information on job search channels, access to job training, adaptation to local culture, and the risk of occupation routinization, we explore possible mechanisms associated with the impact of work permits on occupational transitions.

Our results suggest that Migrants face occupation loss status in Colombia as there

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is a reduction in the proportion of workers in white-collar jobs. This result is expected since migrants require a period of assimilation and acquisition of skills required in the local labor market. However, this is also observed in conjunction with an increase in employment in blue-collar occupations and a reduction in the proportion of migrants outside the labor force. The migration process intensifies the need to generate income and can force individuals in other activities, such as students, to accept a job. This is particularly important for men and young people.

Studying how work permits influence occupational mobility, it is found that migrants with permits have premium employment, and an increment in employment rate, but that it is concentrated in blue-collar jobs. This effect is mainly observed in men and young migrants. Permits have also acted as a mechanism of occupational upgrading, to a lesser extent, especially for young migrants. The increase in the employment rate, which does not necessarily reflect a lower incidence of downgrading, could be explained by migrants' increased access to formal job search channels as well as their adaptation to the local culture. This is also consistent with the access that permits provide to employment opportunities not being related to jobs in occupations with a higher risk of routinization, which would have a direct impact on occupation downgrading.

Our findings imply the relevance of work permits to facilitate access to employment, but also emphasize the need to extend integration mechanisms to the labor market that reduce the misallocation of human capital, which has positive repercussions on the productivity of the workforce. This paper contributes to the literature on the mechanisms of integration of migrants into the labor market and the effects of amnesty and work permit programs.

Existing literature in this regard has focused on analyzing the role of barriers such as discrimination, recruitment procedures, language proficiency, and work credentials, among others (Chiswick and Miller, 2009; Kandel and Donato, 2009; Borjas, 2003; Gagnon et al., 2014). Naturalization and allowing migrants to sign labor contracts are some of the initiatives that have helped migrants improve their labor market outcomes (Riphahn

and Saif, 2018; Zhao and Tang, 2022). Others, like Könönen (2019); Zhang et al. (2021) highlight the role of work centers as a potential solution to reduce migrant work precarity and facilitate their regularization. Among these barriers, the lack of recognition of professional qualifications and work experience (Schuster et al., 2013; Ramboarison-Lalao et al., 2012) is of special interest since it triggers highly skilled migrants to take positions that are below their qualifications and experience. This loss of occupational status is known in the literature as occupational downgrading (Fernando and Patriotta, 2020).

The causes of occupational downgrading are diverse. On the one hand, migrants' skills can generate lower returns due to limited information about the functioning of the total labor market (Martín et al., 2016; Fellini and Guetto, 2019; OCDE, 2020), which is why they obtain jobs in different occupations. This generates an imperfect substitution between migrates and hosts with similar abilities (Lebow, 2022). On the other hand, migrants face a period of adaptation mainly in the absence of a pre-organized job (Brell et al., 2020; Fasani et al., 2022). This idea of adaptation is related to the assimilation argument proposed by Simón et al. (2014), which states that migrants start at a lower occupation level and improve as they accumulate human capital (see also Nikolov et al., 2022; Duleep et al., 2022; Barbiano di Belgiojoso, 2019).

Occupational downgrading has been studied from many perspectives. One is related to the level of education. According to this approach, a worker faces occupation downgrading if his or her level of education[1] is higher (overeducated) than that required for a job (Chiswick and Miller, 2009; Piracha et al., 2023). A second approach is directly related to the types of occupation so that occupational downgrading refers to the loss of occupational status(Crollard et al., 2012; Danzer and Dietz, 2014). Different groups of occupations can be considered based on the nature of the work and the skills required., for instance, comparisons between blue-collar and white-collar occupations (Waldendorf, 2021; Rosenfeld and Spenner, 1992; Fritsch et al., 2022). More complex notions of occupational downgrading have been considered by Ganzeboom and Treiman (1996) who

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[1]Categories 1-3 of ASCO classifications: as they require bachelor or higher. Categories 4-7: as they require diploma or vocational degree. Categories 8-9: as they require secondary education or less.

builds an index that measures occupational status by combining income and educational level. We adopt the first approach after constructing an occupational downgrade defined as the transition between white-collar and blue-collar occupations, e.g., the transition from managerial occupations to elementary occupations using the International Standard Classification of Occupations (ISCO).

We also contribute to the literature on the effects of amnesty programs on migrants. Studies in this branch of literature show that, in general, amnesty and regularization programs improve job access and quality of life of migrants (Kossoudji and Cobb-Clark, 2002; Amuedo-Dorantes and De la Rica, 2007; Monras et al., 2018). In the case of the migration of Venezuelans to Colombia, Bahar et al. (2021) find that work permits have a positive impact on Venezuelans' consumption, food security income, access to safety nets, integration into Colombian society, and resilience to the COVID-19 crisis. Lombardo et al. (2021) evidences that the work permit in Colombia had mitigating effects on the downgrading of migrants measured in terms of wages and the routinization of tasks performed in occupations.

Overall, this paper adds evidence to the studies that examine the impact of work permits granted to migrants in the context of Latin American migration, where the host country has persistent unemployment and high informality, like Colombia. Besides, we employ a novel migration survey that allows us to measure occupational change by comparing the current migration with the former jobs of migrants. Studies considering this measure of downgrading are scarce due to the limited longitudinal information to know the occupations of migrants in the country of origin (Simón et al., 2014), and in general the studies have focused on comparing occupations and income of migrants and native workers with similar characteristics (see for instance Chiswick, 1978; Green, 1999; Izquierdo et al., 2009; Lombardo et al., 2021). And lastly, our research goes beyond by using a wider window of work permit waves, compared to other studies like Bahar et al. (2018) and Lombardo et al. (2021) that study the short-term effects of the work permits.

This paper is organized into six sections, including this introduction. Section 2 relates

the context of Venezuelan migration and work permits in Colombia. Section 3 presents our main source of data. Section 4 outlines the methodology employed, including model and estimations. Section 5 presents the main results and heterogeneous effects. Section 6 concludes.

2   Context of the work permits in Colombia

Since 2014, the Venezuelan economy has contracted dramatically (OECD, 2018; Lombardo et al., 2021; Alhadeff, 2021), which added to high inflation rates and shortages of essential goods (Caruso et al., 2021; Ramoni Perazzi et al., 2017). The result of this situation was a massive exodus of Venezuelans, an unprecedented event in the history of Latin America. Between 2015 and 2019, around 5 million Venezuelans migrated to neighboring countries such as Colombia, Peru, Ecuador, Chile, Brazil, and Argentina (Wolfe, 2021a). While the two main destinations for Venezuelans to migrate outside Latin America in 2018 were Spain and the United States (IADB and OECD, 2021).

In response to the massive migration, in July 2017 the Colombian government created a residence permit called *Permiso Especial de Permanencia* (PEP). To apply for the PEP, the migrant should fulfill the following conditions: have Venezuelan nationality, have entered Colombia with a stamped passport (however, this condition was dropped in August 2018), possess no judicial record, and not be subject to an expulsion or deportation measure. This permit was renewable and expired two years, and allowed access to public services such as education, health, and childcare. This work permit was granted in nine waves between July 2017 and March 2021 and benefited 724,083 migrants. Figure 1 shows the number of granted work permits by year between 2017 and 2019. As noticed, 2018 was the year with the highest number of granted work permits because the Colombian government allowed irregular migrants to register and also increased the contact points where migrants could register.

Figure 1: Total granted work permits in Colombia (2017-2021)
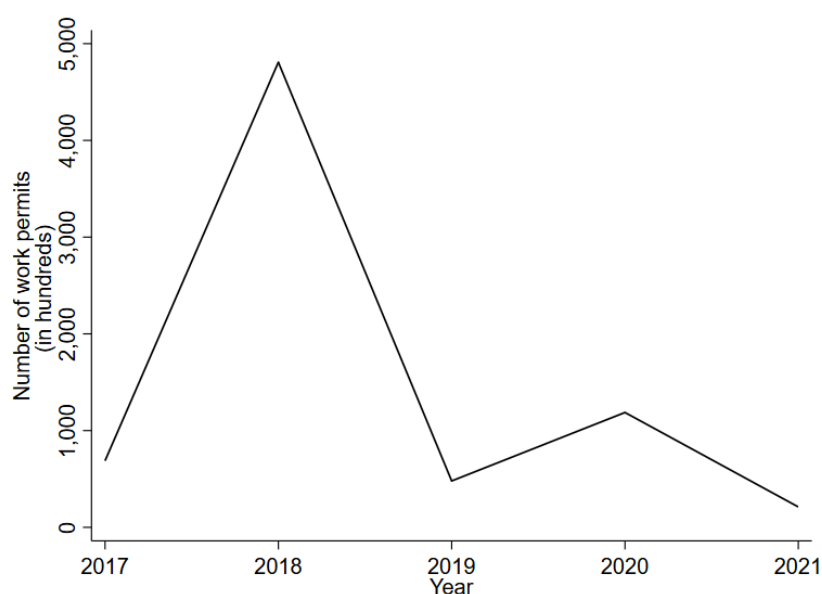
Notes: Data available until May 2021. Source: Own calculations, using
the information provided by Migración Colombia

In January 2021, the Colombian government announced a new residence permit
program called *Permiso de Permanencia Temporal* (PPT) that replaces the old PEP.
However, we do not use it in this analysis given that our EPM of analysis does not have
enough samples with this type of work permit.

3   Data

To provide evidence of occupational downgrading and to what extent work permits
influence this phenomenon, we use information from the EPM survey. This is a unique
survey that collects information about the characteristics of migrants, but interestingly
it includes information about the migration process. That is, it includes variables
that allow measuring characteristics of migrants before coming to Colombia, including
their employment status and type of occupation. Furthermore, this is a representative
longitudinal survey of the Venezuelan migrant population at the national level conducted
by the Colombian National Statistical Office (DANE, its acronym in Spanish) whose

sample is obtained from migrants over 15 years of age, identifiers through Great Integrated Household Survey (*Gran Encuesta Integrada de Hogares* or GEIH, its acronym in Spanish).

We use information from the first four waves collected from July 2021 to April 2022. This database contains information on 12,510 migrants (belonging to 5,759 households), for a total of 30,722 observations.[2] This also allows us to capture the effect of multiple rounds of PEP, in contrast to other studies that only consider holders from the most recent round. Our estimates consider the migrant population between 14 to 65 years old. To measure the loss of coupon status or occupation downgrading, we consider two types of outcomes. First, we measure employment status, which allows us to differentiate before and after the migration process, whether an individual was employed, unemployed, or out of the labor force. Second, to quantify changes in occupation type, we classify occupations between blue-collar and white-collar. Therefore, occupational downgrading means that a migrant who has a white-collar job in Venezuela finds himself in a blue-collar job in Colombia, or even not employed.

Employment status is obtained through the question "What activity did you spend most of your time doing last 7 days?" which has the following response options: Working, Searching for a job, Studying, Household chores, Unable to work (disable), and Other. Employed individuals are those who reported having been working, as the main activity, during the last seven days. Unemployed individuals are those who reported having been searching for a job. And the rest are considered out of the labor force. To identify the transition between the different statuses, the status reported before migrating is compared with the response from the last wave available in Colombia.

To measure the change in occupation we use the question "What was your occupation at the job you were in last 7 days?" which has as output the occupation code corresponding to the ISCO classification adapted for Colombia. We classify the type of occupation

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[2]Wave 1: July 2021 to September 2021. Wave 2: September 2021 to mid-December 2021. Wave 3: Mid-December 2021 to February 2022. Wave 4: February 2022 to April 2022. Subsequent waves do not keep the longitudinal structure.

according to the 1-digit International Standard Classification of Occupations (ISCO-88), which has 10 groups of occupations: (1) Legislators, senior officials, and managers, (2) Professionals, (3) Technicians and associate professionals, (4) Clerks, (5) Service workers and shop and market sales workers, (6) Skilled agricultural and fishery workers, (7) Craft and related trades workers, (8) Plant and machine operators and assemblers, (9) Elementary occupations, (10) Armed forces.[3] We define a white-collar job as a dummy variable that takes the value of one if the individual has an occupation coded between 1 and 5; and zero otherwise.

Finally, another crucial variable in our analysis is knowing if the migrant is a work permit holder. This variable, which is not usually available in household surveys, is captured by EPM survey by directly asking "Do you have PEP?" and "Since which year and month do you have it?". An additional set of socioeconomic characteristics of migrants is used as control variables in our estimations. In particular, gender, age, education years, the reasons for migration, whether to live in rural and urban areas, and the time since arrival to Colombia.

Table 1 presents descriptive statistics for these variables. It is noteworthy that 16.58% of the migrant population in the EPM survey received the PEP work permit. Within this population of PEP holders, in line with the primary objective of the PEP, there is a superior performance in the labor market. This group has a higher employment rate (63.97%), a lower unemployment rate (9.02%), and a smaller share of the population outside the labor force (27.01%) compared to those who did not obtain a work permit (54.55%, 14.96%, and 20.50%, respectively). However, PEP holders are less likely to be employed in white-collar jobs. In addition, PEP holders are predominantly male, with a higher percentage of individuals aged over 34 (44.86%) and with a higher level of education (28.86%) compared to those without PEP (40.75% and 17.19%, respectively).

In general, the Venezuelan migrant population resides in urban areas, with an average

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[3]Armed forces are excluded. Detailed information about the ISCO-88 classification can be found at https://www.eurofound.europa.eu/en/coding-and-classification-standards-0

stay of 3.69 years for PEP holders and 3.31 years for those without PEP. This could be due to early migration, increased awareness of the benefits of carrying the PEP, or stronger social networks, such as family ties, that provide information. In particular, 22.09% of PEP holders traveled for family reasons, while 15.77% of non-PEP holders did so for the same reasons.

Table 1: Descriptive statistics

	WP (%)	No WP (%)
Employed	63.97	54.55
White-collar job	43.83	46.34
Unemployed	9.02	14.96
Out of the labor force	27.01	30.50
Female	44.84	50.58
Age $\geq$ 34	44.86	40.75
Education $\geq$ high school	28.86	17.19
Lives in urban areas	91.97	86.41
Average time in Colombia (years)	3.69	3.31
Migrated for family reasons	22.09	15.77
N	315,302	1,585,911

Notes: *Source:* Authors' calculations using EPM.

On the other side, we also employ the routine task-intensity (RTI) index of Mihaylov and Tijdens (2019). The authors develop a new measure of the task content of occupations using the based on the International Standard Classification of Occupations 2008 (ISCO-08). We cross the corresponding occupation using the ISCO-88 employed in EPM survey. The authors classify tasks as routine or non-routine and as cognitive or manual. They classify the RTI for each occupation depending on whether the task can be replaced by computer-controlled technology and whether the performance of the tasks requires cognitive or manual skills. Further details in section 4.

4 Identification strategy

To quantify the effect of work permits on the probability that the migrants face occupational downgrading, we take advantage of the longitudinal structure to compare the occupational status of migrants with and without permits. In this case, to control for unobservable, time-invariant components at the migrant level, a more precise measurement of occupational downgrading is exploited by comparing migrants' occupations between origin and destination. In particular, we use a canonical difference-in-differences (DID) specification in which the treatment group consists of those migrants with a work permit.

A relevant fact of this analysis is that the assignment of permits is not random since migrants decide to apply or not, depending on whether they meet the requirements. This self-selection can lead to potential biases that may not be corrected through the control variables considered in the estimation, making the assumption of parallel trends not valid. Therefore, to deal with the potential sorting and other endogeneity issues, we estimate an extended version of DID that incorporates an Inverse Probability Weighting (IPW) that measures the inverse of the probability that a migrant holds work permits conditional to the set of control variables. Combining DID and IPW allows us to enhance the validity of causal inferences by addressing issues of selection bias and improving covariate balance between comparison groups.

Therefore, to evaluate the effect of work permits on the occupational downgrading and employment status of migrants, we estimate the following equation:

$$Y_{idt} = \alpha + \beta_1\, WP_i \times T_t + \beta_2 WP_i + \beta_3 T_t + \gamma_d + \delta' X_{idt} + \epsilon_{idt} \tag{1}$$

where i stands for the individual, d for the department (equivalent to State in the U.S.), and t for a year. Y represents the outcomes of interest related to the labor market status (employed, unemployed, out of the labor force) or occupation type (employed in a white-collar job). WP is a dummy variable that takes the value of one if the individual

holds a work permit and zero otherwise. T is a dummy variable that takes the value of one for any observation corresponding to the host country and zero if the migrant was in their home country, Venezuela. X_{idt} is a vector of individual characteristics that include gender, age, education, urban, time in the host country, and whether the individual migrated for family reasons.[4] γ_d are department fixed effects and ϵ_{idt} is the error term.

The coefficient of interest β_1 estimates the effect of the work permits on either employment status or occupational downgrading. All specifications use robust clustered standard errors at the department level. The estimates are weighted using the inverse probability of being a permit holder, which is estimated using the same set of control variables.

Taking into account the possible statuses in Venezuela and Colombia, what we are studying is a transition matrix where the number of possible entries is the combination of states. In order to facilitate our analysis, our estimates are performed conditional on the initial status. This means, for example, that we study whether unemployed individuals in Venezuela with a work permit in Colombia have a greater probability of being employed in Colombia or having a white-collar job. Furthermore, our occupational downgrading analysis allows us to capture possible heterogeneities, e.g. investigating whether work permits help those individuals who were white-collar in Venezuela to keep a similar occupation in Colombia. Possible heterogeneities are also explored by population groups by gender and age.

To assess the impact of work permits on the routinization of the occupations of migrants, on equation 2 we estimate equation 1 but using a routine task-intensity (RTI) index as the outcomes of interest. We assign the RTI value to each occupation (to four digits) following Mihaylov and Tijdens (2019), who classify each occupation as routine or non-routine, and as cognitive or manual. Then, RTI is the result of five components as

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[4]Gender: dummy that takes the value of one if the individual is female. Age: dummy that takes the value of one if the individual is equal to or above 34 years old. Education: dummy that takes the value of one if the individual holds education equal to or above high school. Urban: dummy that takes the value of one if the individual lives in an urban area. Time in the host country: Logarithm of the months that the individual has been living in Colombia.

Equation 3 shows.

$$RTI_{idt} = \alpha + \beta_1 \, WP_i \times T_t + \beta_2 WP_i + \beta_3 T_t + \gamma_d + \delta' X_{idt} + \epsilon_{idt} \tag{2}$$

$$RTI_k = RC_k + RM_k - NRA_k - NRI_k - NRM_k \tag{3}$$

Where RTI is the routine task intensity of occupation k, RC is the routine cognitive intensity, RM is the routine manual, NRA is the non-routine analytic, NRI is the non-routine interactive and NRM is the non-routine manual. Note that RTI increases as the routine cognitive and manual intensity increases and decreases when the NRA, NRI, and NRM increase. RTI index can take values between 1 and -1, where 1 means that occupation k has only routine tasks and -1 indicates that occupation k has only non-routine tasks. We run separate estimates for equation 2 to each one of the five components of the RTI index as the outcome of interest to explore the details of the impact of work permits on routinization.

The routinization index assign each occupation to a task group (RC, RM, NRA, NRI, NRM) according to the work activities that it involves. For example, RC tasks involve activities that can be accomplished by following well-defined rules and procedures. Some examples of routine cognitive tasks include data entry, record keeping, filing documents, ordering supplies, handling incoming calls, and other cognitive skills such as attention to detail, following instructions, organization, and accuracy in performing the assigned duties. RM tasks involve activities that require physical skills, repetitive actions, and following established procedures, to know: operating machinery, assembling products, packing and labeling, cleaning, and maintenance, operating vehicles, performing repetitive tasks, and others that involve manual dexterity, physical coordination, and the ability to perform tasks efficiently and accurately following established protocols or instructions.

Non-routine cognitive tasks are divided into NRA and NRI. NRA tasks are those that require critical thinking, problem-solving, and decision-making skills that cannot be easily automated or programmed such as research and analysis, strategic planning, project

management, data interpretation, problem-solving, and others that require cognitive flexibility, analytical reasoning, and the ability to adapt to changing circumstances or novel challenges that do not have predetermined solutions. NRI tasks require interpersonal skills, communication abilities, and emotional intelligence to engage with others effectively, for example, advising and counseling, negotiating, teaching, customer service, and others that involve effective communication, active listening, empathy, and the ability to interact with others. NRM requires physical skills, creativity, and adaptability that are not easily automated or standardized, such as building and construction, repair and maintenance, personal care services, customized production, culinary arts, manual therapy and other manual activities that that require hands-on skills, craftsmanship, and individualized approaches.

5   Results

We study the occupational change of migrants using descriptive evidence and causal inference. For the descriptive evidence, we analyze the changes in occupation status through transition matrices without controlling for the characteristics of the migrants. These allow us to provide some interesting facts that can be confirmed by regression analysis. Second, we quantify how these transitions are mediated by the possession of work permits by employing a difference in difference identification strategy combined with an IPW.

5.1   Description of the occupation status transitions

In this section, we examine the occupation trajectory of migrants before and after migration. We define occupational status in four categories: employed in a white-collar job, employed in a blue-collar job, unemployed, and out of the labor force. Figure 2 shows the transitions that occurred between the predominantly occupational status in

Venezuela and the current one in Colombia. In the first place, a recomposition of the occupational structure stands out, as evidenced by a significant decrease in the share of migrants in white-collar jobs in Colombia and an increase in the share of blue-collar jobs. This has also been coupled with a notable reduction in the population outside the labor force. In particular, among migrants who change employment status from white-collar jobs in Venezuela, almost half were placed in blue-collar jobs in Colombia (43%), indicating a high prevalence of occupational downgrading.

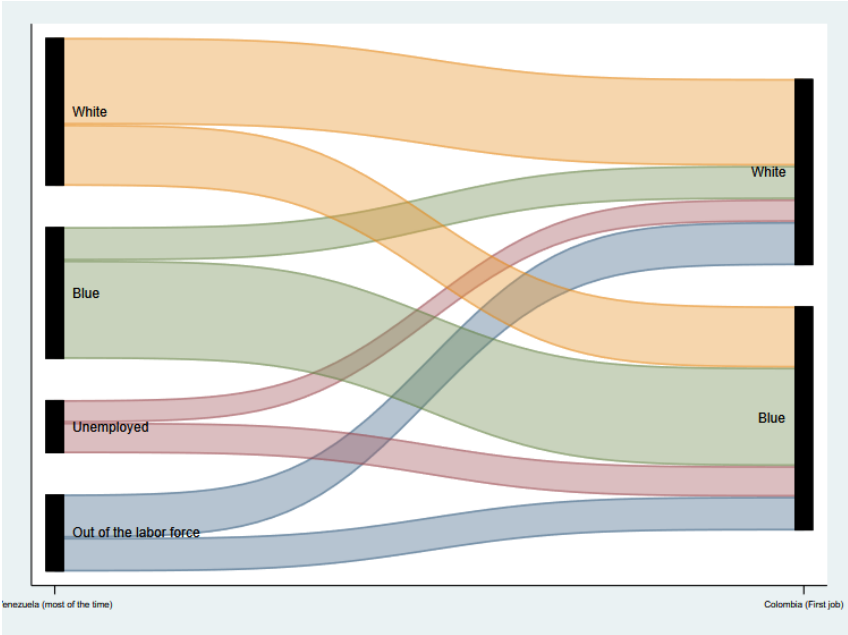Figure 2: Change of occupational status from Venezuela to Colombia
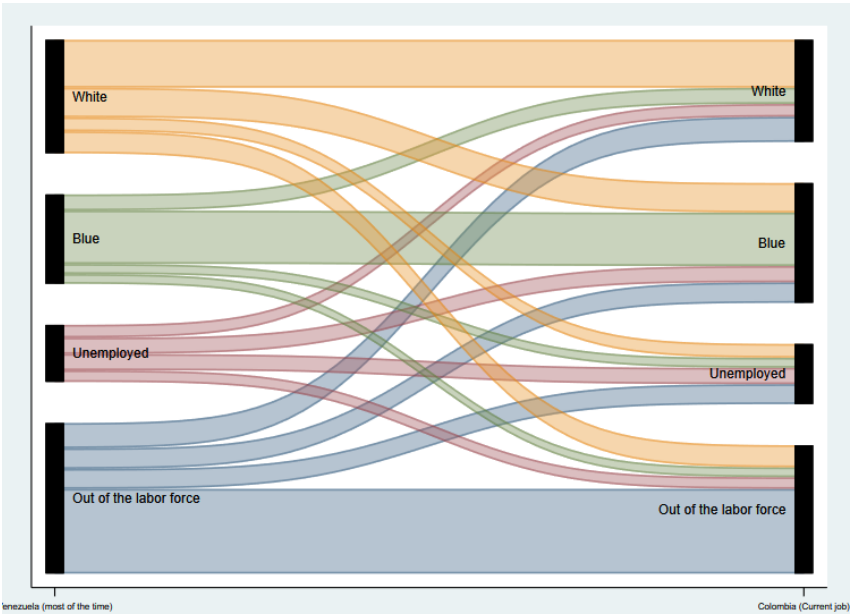
Notes: The left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data.
Source: Authors' calculations using EPM data.

There is also a notable increase in the proportion of blue-collar workers among migrants who were unemployed or out of the labor force in Venezuela. This shows that the need for income generation among migrants pushes them towards low-quality jobs. In fact, following migration, there is a significant reduction in the proportion of migrants who are out of the labor force. Overall, these results show that there is a significant entry of migrants into the employment situation but with a potential downgrading in the type of occupation.

The information available in the EPM survey allows a more detailed characterization of the labor market outcomes of migrants in the transition between Venezuela and Colombia. An interesting variable that is observed is the type of occupation of the first job in Colombia. Although our interest is focused on knowing the influence of work permits on medium-term labor market outcomes, we also analyze the first job in Colombia since the labor trajectory of migrants can be crucially determined by initial labor conditions. Figure 3 presents the probabilities of transition to the occupation status in Venezuela and the first job in Colombia. A relatively higher prevalence of blue-collar jobs is observed (53%) in Colombia. Indeed, most of the unemployed and a significant proportion of workers in white-collar jobs in Venezuela (41%) moved to blue-collar occupations. This seems to show that the presence of downgrading occurs with some persistence in Colombia, from the first job to subsequent ones.

Figure 3: Change of occupational status from Venezuela to Colombia's first job

Notes: The left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the first job in Colombia. EPM survey asks for the migrants' first job only if the migrant indicated he/she is employed at the time of the survey. Then, the right axis considers the first job of those who were employed. *Source*: Authors' calculations using EPM data.

Up to this point, we have compared transition probabilities, but we do not know to what extent these transitions are affected by characteristics of the migrants. It is known that labor market outcomes have been shown to depend on the characteristics of the migrants. For example, the opportunity cost of unemployment and the social and cultural context determine the proability of being employed. To provide some ideas along these lines, transition matrices are estimated by gender and age groups. Figure A.1 compares the results for men and women and shows that both groups behave similarly, with a higher propensity for occupation downgrading among men.

Interestingly, it is also observed that the most frequent transition for women is between white-collar jobs and out of the labor force in Colombia. Around 17% of female migrants who had white-collar jobs in Venezuela became to be out of the labor force in Colombia; compared to the 3% of the corresponding male population. Gender norms and structural constraints related to employment can account for these findings. In particular, household division of labor, restricted access to childcare services, and the lost of the social capital established in Venezuela may explain these outcomes, as suggested by Ressia et al. (2016). Similarly, older women might have encountered challenges to update their skills due to caregiving responsibilities. Hence, as the labor market demands more qualifications, women may choose to exit the workforce.

An interesting findings in the comparison of age group is that adult migrants are the most affected by the phenomenon of downgrading (see Figure A.2). Approximately 16% of the youngest migrants transitioned from white-collar jobs to being out of the labor force. In contrast, this percentage rises to 24% for migrants aged 34 and above, indicating that older migrants encounter more barriers to entering the labor market. Besides, examining heterogeneities within this group, we observe that women above 34 years old face more difficulties in remaining in the labor market. These results are consistent with the findings in Ballarino and Panichella (2017) that suggest that difficulties in certification of competences, limited networks, and age and gender discrimination explain why older women face a lower employment rate. Among younger workers it is observed a rise in the

share of white-collar workers in Colombia, and a reduction in the share of workers out of the labor force.

Preliminary insights about the influence of work permits on changes in migrant occupations can be obtained by analyzing the transitions, and differentiating between migrants who have and do not have work permits. According to Figure A.3 the majority of work permit holder migrants were already employed in Venezuela, and this proportion increased slightly in Colombia. However, this increase coincides with occupational downgrading, since most of the increase in employment is concentrated in blue-collar jobs. In turn, for migrants without a permit, there is no significant change in their employment rate in Colombia. This might indicate that the permits have encouraged insertion into the labor market generating a sort of employment premium, however, they do not seem to facilitate employment in occupations at the same levels of qualification.

Although our measure of occupation downgrading consists of comparing occupation in Venezuela and Colombia, EPM survey also allows us to have some insights about the labor trajectory of migrants since their arrival to Colombia. In particular, the transitions between employment statuses before and after obtaining the work permit are shown in Figure A.4. This allows us to explore the assimilation hypothesis as described by Simón et al. (2014). Among migrant workers with permits, an improvement in their employment trajectory is observed with an increase in the proportion of workers in white-collar jobs.

The work permits tenure could have differential effects by population groups. To investigate this, we analyze labor market transitions by gender and age group. Results indicate that there is an occupational composition effect for men, leading to significant changes favoring increased employment, particularly in blue-collar jobs (see Figure A.5). On the other hand, among women, a more pronounced increase is observed in the proportion of white-collar workers. Regarding age (see Figure A.6), the employment proportion rises for both groups, but it is young individuals who predominantly contribute to the growth in white-collar jobs and the reduction in the proportion of unemployed. This shows that permit tenure is related to changes in occupations status. To address

this question from a causal perspective, a strategy is needed to estimate an appropriate control group, as those with work permits are predominantly employed with a high level of education. Therefore, we implemented an identification strategy to control for selection biases.

5.2 Impact of work permits on labor market outcomes

To contrast whether work permits have a mediating effect on migrants' labor transitions, we estimated the Equation 1 conditional to each occupation status in Venezuela. The combination of states between Venezuela and Colombia yields a total of 16 probabilities, which we analyze from the perspective of a Markov process. In other words, we examine the transition probability to a final state in Colombia conditional on what is observed in the initial state. Thus, for each state in Venezuela, four regressions are estimated indicating the probability of being employed, being a white-collar worker, unemployed, or out of the labor force in Colombia.

Table 2 presents the results for all possible transitions. We find that overall, holding work permits impacts labor market outcomes for those migrants who were unemployed before migration. Specifically, Panel C evidences that work permits help them to increase their likelihood of being employed (14.1 percentage points) and decrease their likelihood of being out of the labor force (12 percentage points). Although it is not statistically significant, the results for employment are positive, while the effect on the probability of being out of labor force they are negative.

These results in the aggregate respond to some interesting heterogeneous findings. Tables B.1, B.2, B.3 and B.4 shows the heterogeneous effects to each group of migrants categorized by what was their employment status in Venezuela, correspondingly. In fact, although some results in the aggregate are not statistically significant, for some groups, significant impacts are found. For instance, Table B.1, Panel C, demonstrates that work permits reduce the probability of younger migrants in white-collar jobs of being out of

the labor force by 5 percentage points. Thus, work permits seem to motivate labor participation among young migrants.

Table 2: Impact of work permits on labor market outcomes of migrants

Variables	(1) Employed	(2) White-collar job	(3) Unemployed	(4) Out of the labor force
Panel A. Migrants who were *white-collar* in Venezuela				
WP × T	0.023	-0.029	0.015	-0.038
	(0.026)	(0.035)	(0.014)	(0.027)
Observations	2,836	2,217	2,836	2,836
R-squared	0.243	0.358	0.082	0.198
Panel B. Migrants who were *blue-collar* in Venezuela				
WP × T	0.037	0.010	-0.005	-0.032
	(0.047)	(0.058)	(0.025)	(0.045)
Observations	2,082	1,711	2,082	2,082
R-squared	0.201	0.220	0.092	0.193
Panel C. Migrants who were unemployed in Venezuela				
WP × T	0.141*	-0.090	-0.021	-0.120**
	(0.075)	(0.080)	(0.034)	(0.049)
Observations	938	699	938	938
R-squared	0.581	0.440	0.784	0.230
Panel D. Migrants who were out of the labor force in Venezuela				
WP × T	0.053	-0.017	-0.021	-0.032
	(0.041)	(0.088)	(0.029)	(0.033)
Observations	3,276	2,088	3,276	3,276
R-squared	0.322	0.565	0.087	0.409

Notes: The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

In turn, female blue-collar workers in Venezuela experience an 18.3 percentage point decrease in the likelihood of obtaining white-collar jobs. (see Table B.2). For blue-collar workers, it can be expected that the expected salary is relatively low, combined with the

loss of networks and a higher demand for caregiving and domestic jobs, making it difficult to get job training and experience for upward occupational mobility. In contrast, in the case of men, the reduction in the probability of being out of the labor force is significant.

The observed results for the total of unemployed migrants in Venezuela are explained by the increased participation of women and an increase in the employment rate of men. Both effects seem to be more strongly related to young migrants (see Figure B.3). Thus, work permits appear to have a significant effect on the restructuring of employment, mainly for the youth. Work permits may be acting as a market signal that creates employment opportunities for the unemployed, and in the case of female workers, increasing labor participation by 18 percentage points (Alberti, 2014; Ida and Talit, 2015).

These results present evidence that work permits are essential to increase the employment rate among migrants, especially for women and the youngest. Additionally, evidence of occupation downgrading among migrants is obtained, which is not corrected by work permits. Work permits serve to improve the labor inclusion of migrants; however, it seems necessary to incorporate other elements that enhance the matching between migrants and jobs, ensuring a greater return on human capital. These results are consistent with the evidence that work permits can empower blue-collar workers by providing them with a sense of autonomy over their employment status (Saari et al., 2022), accumulation of firm-specific human capital through the gain of valuable skills and experience within specific firms (Schwerdt et al., 2008), and access to professional development given that work permits allow access to formal jobs and then better wages. Our results contrast with findings in Bahar et al. (2021), which document no significant impacts on the overall labor force, except for the informal sector. However, they did observe significant effects on the formalization of Venezuelan workers, which is the primary objective of the program

A crucial question to understand the impacts of work permits is to identify the factors associated with labor market insertion that permits can reduce barriers to access or facilitate. It is possible to think that migrants with work permits are closer or

committed to integration support institutions and therefore have better information about labor intermediation processes, especially formal channels of job search. Additionally, the permit also acts as a requirement to access specific job training programs or title homologation. EPM allows measuring some of these aspects, so we explore to what extent they can mediate the impact of work permits on labor status. In this case, there is information available on whether, for example, migrants use formal job search channels in Colombia, and therefore our counterfactual analysis consists of comparing migrants with and without permits in an OLS specification. In this case, we use the same control variables used in equation 1.

Table 3: Mechanisms explaining the impact of work permits

Variables	Difficulty finding a job	Information on formal jobs	Formal job seeking mechanism	Work in street	Work in online apps	Employer was a friend	Job training	Title homologation	Identify with colombian culture
WP	-0.027	0.045***	0.140	-0.039**	0.002	-0.008	0.022**	-0.008	0.026*
	(0.019)	(0.015)	(0.129)	(0.019)	(0.006)	(0.013)	(0.009)	(0.015)	(0.016)
Constant	0.626***	0.450***	1.973***	0.089	-0.007	0.167**	-0.022	-0.062	0.728***
	(0.077)	(0.066)	(0.530)	(0.091)	(0.028)	(0.066)	(0.037)	(0.103)	(0.068)
Observations	6,495	3,682	3,456	3,456	3,454	3,441	8,914	3,507	4,680
R-squared	0.065	0.247	0.082	0.064	0.042	0.046	0.041	0.085	0.142

Notes: The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

We have evidence that work permits have a positive impact on the likelihood of receiving information on formal jobs and having job training. These findings are significant because work permit holders engage in more formal job search processes and accumulate human capital. The former is particularly crucial since the most prevalent method for job searching relies on social networks, such as friends and family members. These factors can also contribute to reducing occupation downgrading. The increase in labor force participation may also be a response to these mechanisms, as access to more information and training programs increases the probability of obtaining employment. This also aligns with the result indicating that work permits reduce the probability of migrants working on the street. This is relevant considering that the informality rate among migrants is around 90% (see García-Suaza et al., 2024).

The previous outcomes are directly related to the job search process and the type of work. However, work permits also affect social integration (Zhao and Tang, 2022), that is, they promote adaptation to the culture and other idiosyncratic aspects of the destination country. Therefore, we analyze whether work permits influence the probability of migrants identifying with Colombian culture. This is an important aspect, as it may be a factor of self-exclusion that affects labor market outcomes. Our results support the idea that work permits have a positive effect on integration into the local culture.

The evidence favors the idea that migrants with permits may change their job search behavior, which is in line with the increase in the employment rate. However, the results also show that this does not necessarily improve the quality of employment or mitigate occupation downgrading resulting from the location change. As a final piece of analysis, we study whether permits are related to the type of occupation of migrants, i.e., whether occupations have specific task content. It can be expected that if migrants are more likely to have blue-collar jobs, they may perform elementary tasks related to higher levels of routinization. From the perspective of human capital misallocation, this is a relevant element for understanding the medium and long-term labor trajectories of migrants. Therefore, in essence, we investigate whether the rise in employment and participation might be explained by a higher access to more routine jobs.

Studies focused on differentiating occupations are based on the Routine Task Intensity (RTI) index, which allows for ranking occupations based on the risk of automation. This index combines measurements of the level of routine or non-routine, and as cognitive or manual as explained in section 4. For our study, we include RTI taken from Mihaylov and Tijdens (2019) and its five components as a dependent variable. As we can observe the type of occupation in Venezuela and Colombia, our differences-in-differences specification allows us to compare whether permits reduce employment in occupations with a higher risk of routinization. Mihaylov and Tijdens (2019) also provides a routinization index according to each task group, which allows us to decompose into the content of other types of tasks, particularly routine cognitive and manual tasks, as well as three types of

non-routine tasks named: analytic, interactive, and manual. For each of these variables, we implement separate estimations.

According to Tables C.1 overall there is no evidence that the work permit is related to access to jobs with high levels of RTI; however, we find significant results for male and young migrant workers. Figure 4 evidences that there are no significant results on routinization; but when Figure 5, Panel A, disaggregates the five components of the RTI we find that work permits increased the non-routine manual index of male migrants who used to be white-collar in Venezuela (see values on Table C.2, Panel B). Likewise, the youngest workers increase their routine manual but decrease their non-routine interactive content of jobs (see values on Table C.2, Panel C). On the other side, Figure 5, Panel B, shows that for the case of migrant workers who used to be *blue-collar* in Venezuela, we only find negative and significant effects for the youngest population (see values on Table C.3, Panel C). Specifically, work permits decrease the non-routine analytic content of their occupations in Colombia by 3 percentage points. However, overall, the increase in the employment rate does not seem to be due to a higher incidence of jobs with higher RTI compared to occupations in the home country.

The latter means that work permits help males and the youngest migrants work in more manual jobs compared to what they used to do in Venezuela. It can be explained because of the sector where the non-routine manual jobs are mainly concentrated: construction, personal care services, repair, and maintenance where there is a high demand for migrant workers but given the risks associated with them and the need for insurance, work permits are required. On the other side, the negative impact of the work permits on the non-routine analytic and interactive occupations of youngest migrants who used to be *blue-collar* in Venezuela, might suggest that even with work permits it is hard for youngest migrants to move to non-routine jobs. It can be explained because of discrimination Janta et al. (2011). Other authors suggest that loss of wages, anxiety, and fear can affect their mental and physical well-being and, consequently, their ability to engage in interactive works (Singh and sharma, 2022; Joshi et al., 2011; Daly et al.,
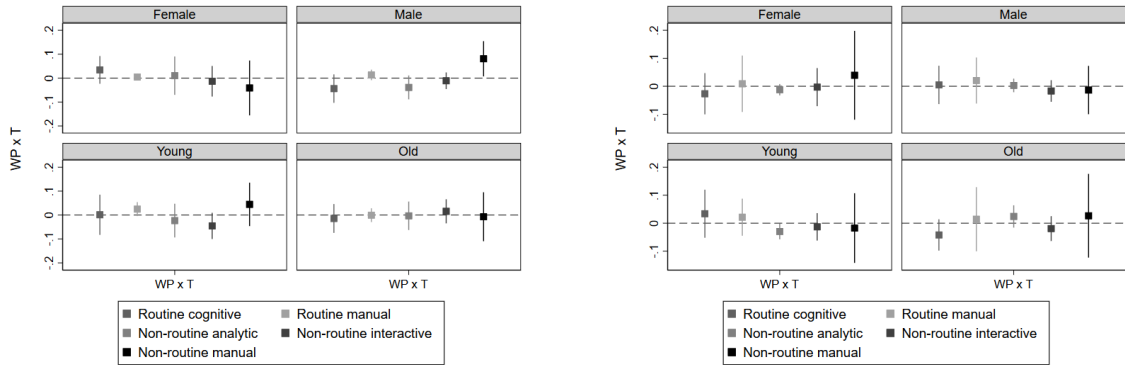
Figure 4: Impact of work permit on RTI
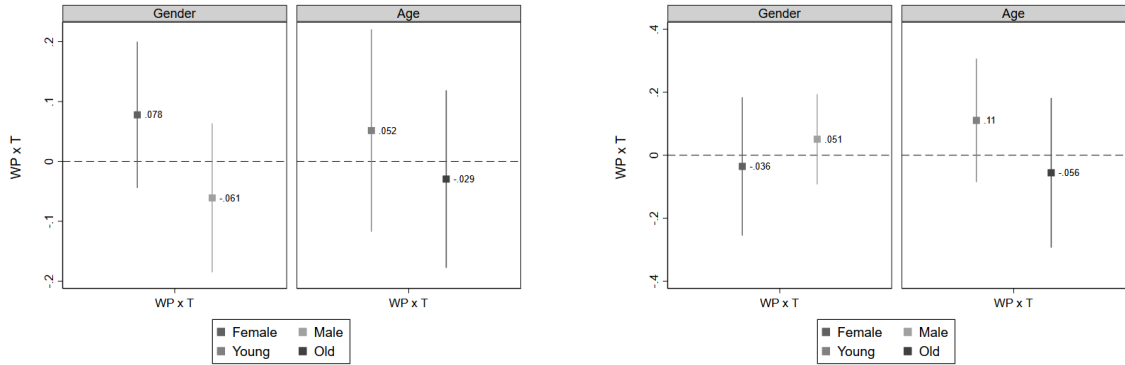
(a) *White-collar* job in Venezuela   (b) *Blue-collar* job in Venezuela

Notes: *Source*: Authors' calculations using EPM data.

Figure 5: Impact of work permit on the five components of RTI

(a) *White-collar* job in Venezuela   (b) *Blue-collar* job in Venezuela

Notes: *Source*: Authors' calculations using EPM data.

6   Concluding remarks

Migration in the Global South has been regaining importance on the public policy agenda, and at the same time has led to the growth of literature studying the impacts mainly on the labor market. The case of Venezuelan migration in Colombia has gained prominence in recent literature. Numerous studies have emphasized that the primary effects are concentrated in the informal labor sector, with negligible impact on unemployment rates.

The magnitude of the migratory influx has led to the development of programs to promote the social and economic integration of migrants. Along these lines, the Colombian government has promoted an unprecedented residence and work permit policy, which has allowed access to formal employment and other essential services. García-Suaza et al. (2024) show that there is evidence of a migrant assimilation process to the extent that the time of arrival in Colombia is related to better labor market outcomes, while Bahar et al. (2018) suggests that work permits exhibit a low influence on the labor market and enhance the well-being of migrants, encompassing aspects such as consumption, total income, and overall welfare. Our study contributes to this discussion by investigating the degree to which work permits contribute to migrants' enhanced adaptation to the labor market, particularly whether work permits mitigate occupation downgrading and the routinization of jobs, compared to their occupational status in Venezuela.

Utilizing the EPM survey, a novel instrument that includes information about the employment characteristics of migrants in the home country, we implement a Differences-in-Differences (DID) approach alongside the Inverse Probability Weighting (IPW) method. Our findings offer a comprehensive examination of occupational transitions among Venezuelan migrants in Colombia. The descriptive analysis and causal inference reveal a discernible phenomenon of occupational downgrading. However, the implementation of work permits emerges as a mitigating factor in alleviating the decline in occupational status.

Notably, permits contribute to a reduction in unemployment rates, particularly among the youth demographic, aligning with the assimilation model proposed by Simón et al. (2014). Despite an overall increase in employment rates, the surge is notably concentrated in blue-collar occupations. This suggests that migrants are adapting to the local labor market, but there is a sort of misallocation of human capital that affects the productivity and long-term career trajectory of migrants. Our empirical analysis evidence that work permits facilitate women and the youngest to improve their labor market outcomes. For instance, work permits decreased the probability of being out of the labor force for female

migrants in white-collar, unemployed, or out of the labor force in Venezuela. Likewise, work permits increase the probability of being employed for those migrants below 34 years old who used to be unemployed in Venezuela.

We also explore what determines the increase in the employment rate. Our results suggest that permits also improve access to formal job search channels and enhance migrants' adaptation to the local culture. These aspects are crucial for reducing occupation downgrading. Therefore, permits promote employment but neither reduce nor exacerbate occupation downgrading, which is also evidenced by the nuanced effects it presents on employment in occupations with high levels of routinization. This implies that in terms of correcting misallocation of human capital the impact of the permits may be limited and requires other mechanisms to improve matching with employment. This could be achieved by improving knowledge of the local labor market or encouraging the accumulation of high-demand skills.

Finally, we assess the impact of work permits on the routinization task intensity of the job of migrants. We find that permits increase the routinization of jobs of male migrants who used to be white-collar in Venezuela. Likewise, work permits increase the routine-manual and non-routine interactive intensity of the jobs of youngest migrants who used to have a *white-collar* in Venezuela. Regarding the migrants who used to be *blue-collar* in Venezuela, we have evidence that work permits decrease the non-routine analytic intensity of the jobs of the youngest population. Literature suggests that discrimination, anxiety, and other stress factors might affect the engagement of migrants in interactive jobs. Then, besides policies that help migrants to get job training or homologate their titles, health programs, and anti-discrimination initiatives might work to reduce the misallocation of human capital, which has positive repercussions on the productivity of the workforce.

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7 Appendix

A Change of occupational status by subsamples

Figure A.1: Change of occupational status from Venezuela to Colombia, by gender
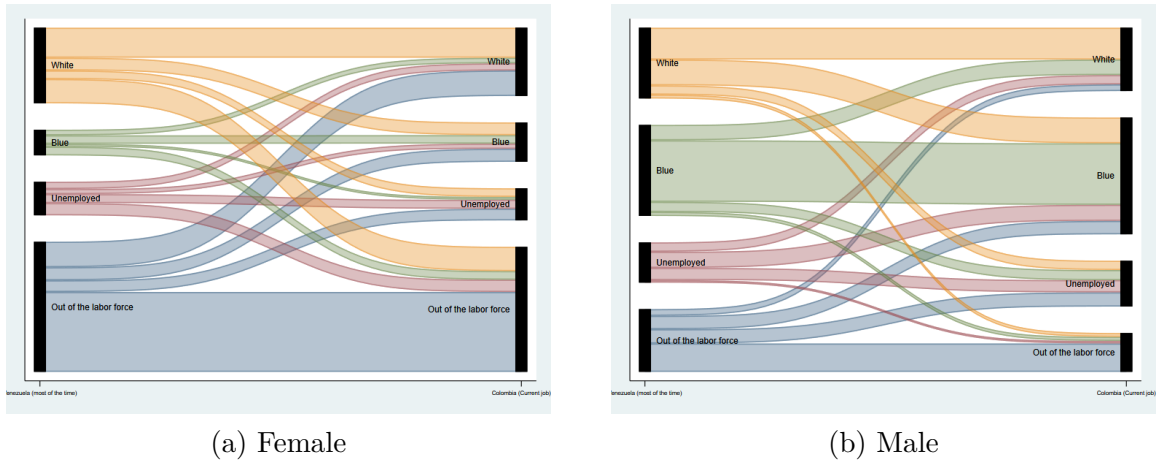
(a) Female

(b) Male

Notes: In each panel, the left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations using EPM data.

Figure A.2: Change of occupational status from Venezuela to Colombia, by age group
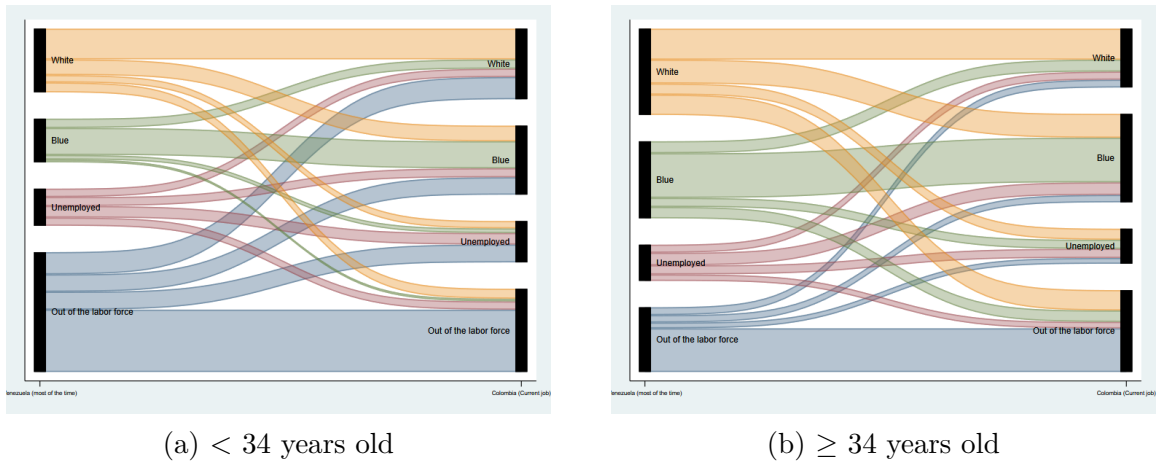
(a) < 34 years old

(b) ≥ 34 years old

Notes: In each panel, the left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations using EPM data.

Figure A.3: Change of occupational status from Venezuela to Colombia, by legal status

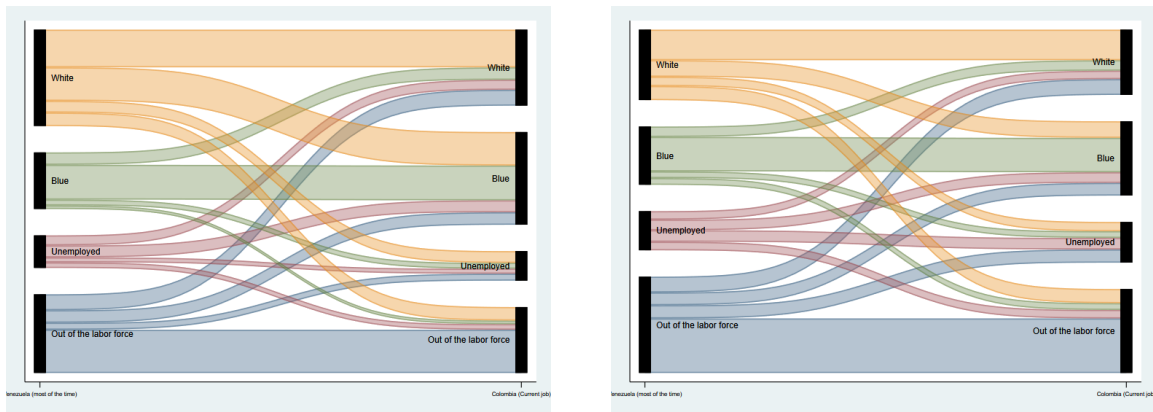(a) Work permit holders   (b) No work permit

Notes: In each panel, the left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations using EPM data.

Figure A.4: Change of occupational status before and after work permit

Notes: This sample considers only migrants with work permit. In each panel, the left axis corresponds to the occupation of the last job in which the migrant worked. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2, which has less missing data. *Source*: Authors' calculations using EPM data.

Figure A.5: Change of occupational status from Venezuela to Colombia of migrants with work permits, by gender
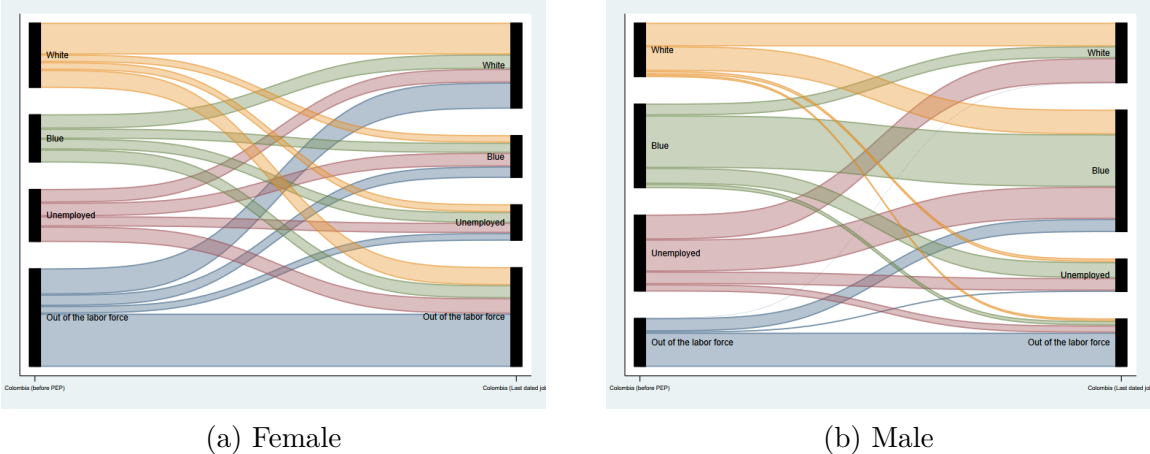
(a) Female

(b) Male

Notes: This sample considers only migrants with work permit. In each panel, the left axis corresponds to the occupation of the last job in which the migrant worked. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations using EPM data.

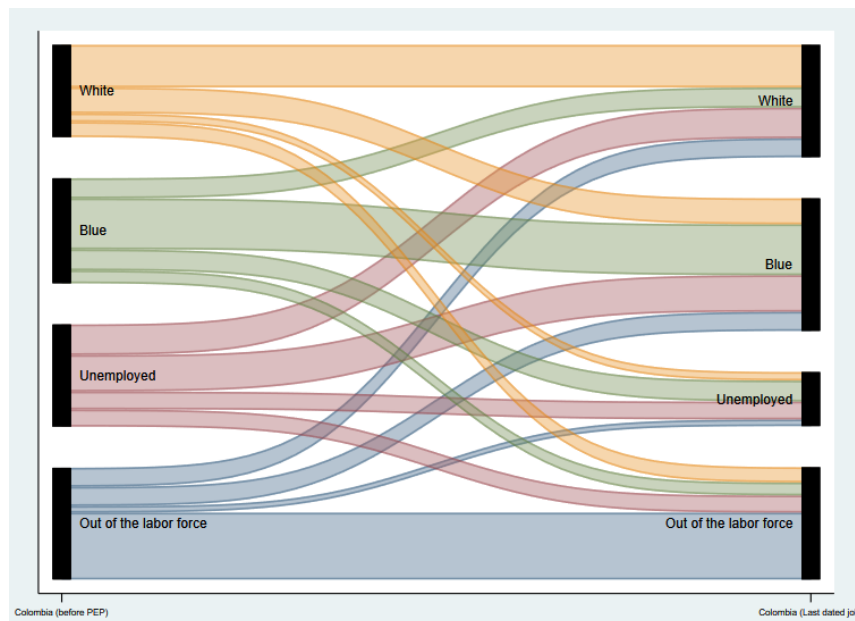Figure A.6: Change of occupational status from Venezuela to Colombia of migrants with work permits, by age group

(a) < 34 years old
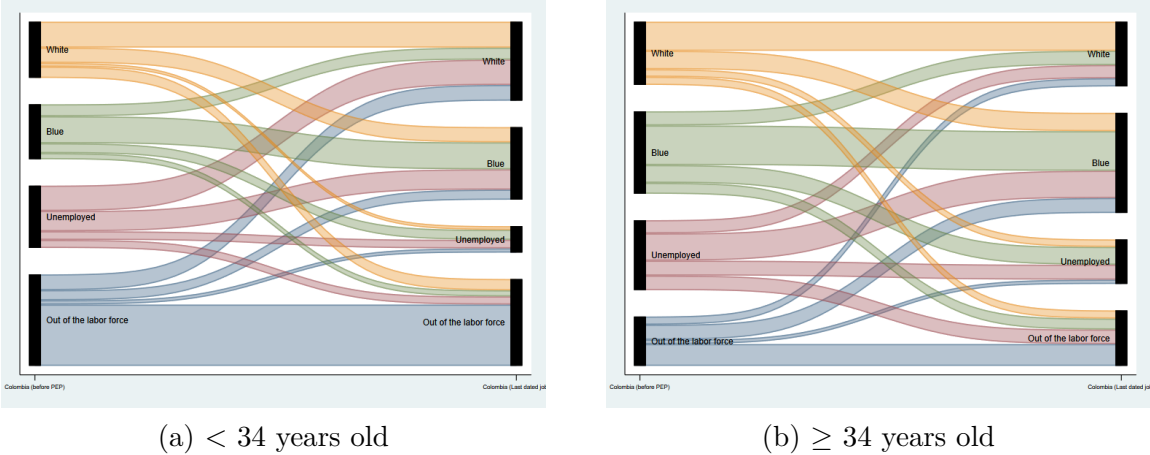
(b) ≥ 34 years old

Notes: This sample considers only migrants with work permit. In each panel, the left axis corresponds to the occupation of the last job in which the migrant worked. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations using EPM data.

B Impact of work permits on occupational mobility by population groups

Table B.1: Heterogeneous impacts of work permits on labor market outcomes of migrants who had a *white-collar* job in Venezuela

Variables	Employed	Employed *White-collar*	Unemployed	Out of the labor force
Panel A. Female				
WP x T	0.048	0.009	0.027	-0.075
	(0.061)	(0.072)	(0.025)	(0.053)
Observations	1,618	1,153	1,618	1,618
R-squared	0.326	0.284	0.115	0.253
Panel B. Male				
WP x T	-0.017	-0.058	-0.000	0.017
	(0.034)	(0.053)	(0.030)	(0.019)
Observations	1,218	1,064	1,218	1,218
R-squared	0.118	0.434	0.099	0.087
Panel C. Age < 34 years old				
WP x T	0.034	-0.063	0.016	-0.050*
	(0.039)	(0.056)	(0.026)	(0.028)
Observations	1,364	1,082	1,364	1,364
R-squared	0.298	0.380	0.130	0.210
Panel D. Age ≥ 34 years old				
WP x T	0.015	0.004	0.013	-0.028
	(0.036)	(0.061)	(0.021)	(0.042)
Observations	1,472	1,135	1,472	1,472
R-squared	0.237	0.384	0.101	0.214

Notes: The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table B.2: Heterogeneous impacts of work permits on labor market outcomes of migrants who had a *blue-collar job* in Venezuela

Variables	Employed	Employed *White-collar*	Unemployed	Out of the labor force
Panel A. Female				
WP x T	0.041	-0.183*	-0.043	0.002
	(0.115)	(0.098)	(0.029)	(0.103)
Observations	570	394	570	570
R-squared	0.382	0.463	0.157	0.353
Panel B. Male				
WP x T	0.033	0.052	0.008	-0.042***
	(0.033)	(0.058)	(0.031)	(0.011)
Observations	1,512	1,317	1,512	1,512
R-squared	0.142	0.209	0.120	0.078
Panel C. Age < 34 years old				
WP x T	0.074	0.120	-0.067***	-0.007
	(0.051)	(0.075)	(0.023)	(0.043)
Observations	924	785	924	924
R-squared	0.224	0.279	0.131	0.238
Panel D. Age ≥ 34 years old				
WP x T	0.002	-0.093	0.046	-0.047
	(0.065)	(0.071)	(0.043)	(0.061)
Observations	1,158	926	1,158	1,158
R-squared	0.243	0.248	0.155	0.207

Notes: The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table B.3: Heterogeneous impacts of work permits on labor market outcomes of migrants who were *unemployed* in Venezuela

Variables	Employed	Employed *White-collar*	Unemployed	Out of the labor force
Panel A. Female				
WP x T	0.152	-0.091	0.028	-0.180*
	(0.129)	(0.094)	(0.068)	(0.089)
Observations	430	291	430	430
R-squared	0.463	0.606	0.821	0.334
Panel B. Male				
WP x T	0.099*	-0.060	-0.061	-0.038
	(0.055)	(0.107)	(0.043)	(0.030)
Observations	508	408	508	508
R-squared	0.701	0.396	0.777	0.119
Panel C. Age < 34 years old				
WP x T	0.176**	-0.127	-0.001	-0.175***
	(0.081)	(0.139)	(0.068)	(0.033)
Observations	572	423	572	572
R-squared	0.620	0.524	0.800	0.269
Panel D. Age ≥ 34 years old				
WP x T	0.107	-0.013	-0.048	-0.059
	(0.081)	(0.095)	(0.041)	(0.091)
Observations	366	276	366	366
R-squared	0.588	0.464	0.800	0.260

Notes: The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table B.4: Heterogeneous impacts of work permits on labor market outcomes of migrants who were *out of the labor force* in Venezuela

Variables	Employed	Employed *White-collar*	Unemployed	Out of the labor force
Panel A. Female				
WP x T	0.074	-0.039	0.001	-0.075*
	(0.049)	(0.064)	(0.032)	(0.038)
Observations	2,392	1,496	2,392	2,392
R-squared	0.307	0.640	0.092	0.378
Panel B. Male				
WP x T	0.003	0.011	-0.082*	0.079
	(0.088)	(0.181)	(0.042)	(0.068)
Observations	884	592	884	884
R-squared	0.414	0.465	0.160	0.550
Panel C. Age < 34 years old				
WP x T	0.012	0.005	-0.026	0.014
	(0.045)	(0.127)	(0.038)	(0.040)
Observations	2,388	1,541	2,388	2,388
R-squared	0.333	0.601	0.101	0.433
Panel D. Age ≥ 34 years old				
WP x T	0.148**	-0.045	-0.013	-0.135**
	(0.063)	(0.113)	(0.030)	(0.063)
Observations	888	547	888	888
R-squared	0.357	0.544	0.115	0.418

Notes: The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

C Impact of work permits on routinization

Table C.1: Impact of work permits on RTI

Variables	RTI	RC	RM	NRA	NRI	NRM
Panel A. Migrants who had a *white-collar* job in Venezuela						
WP × T	0.002	-0.010	0.011	-0.004	-0.015	0.016
	(0.044)	(0.022)	(0.007)	(0.022)	(0.013)	(0.025)
Observations	2,195	2,195	2,195	1,861	2,195	2,195
R-squared	0.062	0.092	0.087	0.203	0.135	0.238
Panel B. Migrants who had a *blue-collar* job in Venezuela						
WP x T	0.023	-0.004	0.016	-0.002	-0.015	0.004
	(0.056)	(0.028)	(0.036)	(0.010)	(0.017)	(0.034)
Observations	1,637	1,637	1,637	1,614	1,637	1,637
R-squared	0.137	0.097	0.128	0.100	0.154	0.139

Notes: RC: Routine cognitive; RM: Routine manual; NRA: Non-routine analytic; NRI: Non-routine interactive; NRM: Non-routine manual. The sample of these estimates corresponds to the migrants with the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. pd*** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table C.2: Heterogeneous impacts of work permits on RTI who were *white-collar* in Venezuela.

Variables	RTI	RC	RM	NRA	NRI	NRM
Panel A. Female						
WP x T	0.078	0.034	0.005	0.010	-0.013	-0.041
	(0.059)	(0.028)	(0.007)	(0.039)	(0.031)	(0.055)
Observations	1,146	1,146	1,146	919	1,146	1,146
R-squared	0.109	0.123	0.078	0.269	0.140	0.322
Panel B. Male						
WP x T	-0.061	-0.044	0.013	-0.039	-0.011	0.081**
	(0.060)	(0.029)	(0.011)	(0.024)	(0.017)	(0.036)
Observations	1,049	1,049	1,049	942	1,049	1,049
R-squared 0.069	0.120	0.126	0.228	0.184	0.234	
Panel C. Age < 34 years old						
WP x T	0.052	0.001	0.025*	-0.023	-0.045*	0.045
	(0.082)	(0.041)	(0.014)	(0.034)	(0.027)	(0.044)
Observations	1,074	1,074	1,074	886	1,074	1,074
R-squared	0.112	0.144	0.130	0.228	0.189	0.286
Panel D. Age ≥ 34 years old						
WP x T	-0.029	-0.014	-0.000	-0.003	0.016	-0.007
	(0.072)	(0.029)	(0.014)	(0.029)	(0.024)	(0.049)
Observations	1,121	1,121	1,121	975	1,121	1,121
R-squared	0.096	0.127	0.118	0.257	0.161	0.266

Notes: RC: Routine cognitive; RM: Routine manual; NRA: Non-routine analytic; NRI: Non-routine interactive; NRM: Non-routine manual. The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table C.3: Heterogeneous impacts of work permits on RTI who were *blue-collar* in Venezuela.

Variables	RTI	RC	RM	NRA	NRI	NRM
Panel A. Female						
WP x T	-0.036	-0.027	0.009	-0.012	-0.003	0.039
	(0.106)	(0.035)	(0.049)	(0.010)	(0.033)	(0.076)
Observations	389	389	389	381	389	389
R-squared	0.280	0.342	0.278	0.295	0.329	0.290
Panel B. Male						
WP x T	0.051	0.005	0.021	0.003	-0.017	-0.013
	(0.069)	(0.033)	(0.040)	(0.012)	(0.019)	(0.042)
Observations	1,248	1,248	1,248	1,233	1,248	1,248
R-squared	0.130	0.080	0.140	0.099	0.125	0.148
Panel C. Age < 34 years old						
WP x T	0.111	0.034	0.021	-0.030**	-0.013	-0.017
	(0.095)	(0.041)	(0.032)	(0.013)	(0.024)	(0.060)
Observations	760	760	760	745	760	760
R-squared	0.176	0.145	0.151	0.124	0.239	0.178
Panel D. Age ≥ 34 years old						
WP x T	-0.056	-0.042	0.014	0.024	-0.019	0.026
	(0.115)	(0.027)	(0.055)	(0.019)	(0.021)	(0.072)
Observations	877	877	877	869	877	877
R-squared	0.206	0.146	0.205	0.198	0.199	0.203

Notes: RC: Routine cognitive; RM: Routine manual; NRA: Non-routine analytic; NRI: Non-routine interactive; NRM: Non-routine manual. The sample of these estimates corresponds to the migrants who had the occupational status indicated in the title. The estimates include the same controls described in Equation 1. Clustered standard errors at the department level are reported in parentheses. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.