García-Suaza, Andres; Mondragón-Mayo, Angie; Sarango-Iturralde, Alexander

Working Paper

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GLO Discussion Paper, No. 1606

Provided in Cooperation with:
Global Labor Organization (GLO)

Suggested Citation: García-Suaza, Andres; Mondragón-Mayo, Angie; Sarango-Iturralde, Alexander (2025) : From Exodus to Employment: Labor Market Transitions and the Role of Work Permits in Colombia, GLO Discussion Paper, No. 1606, Global Labor Organization (GLO), Essen

This Version is available at:
https://hdl.handle.net/10419/315812

From Exodus to Employment: Labor Market Transitions and the Role of Work Permits in Colombia

Andres García-Suaza* Angie Mondragón-Mayo†

Alexander Sarango-Iturralde ‡

April 26, 2025

Abstract

The Venezuelan migration crisis has led to large-scale displacement, with over 2.5 million Venezuelans seeking refuge in Colombia. This study assesses the impact of the PEP on labor market outcomes for Venezuelan migrants. Using data from the EPM survey and a difference-in-differences methodology, the study compares pre- and post-migration labor conditions. Findings indicate that while PEP holders have increased access to formal ways of employment, it does not significantly mitigate occupational downgrading, as many migrants, especially those with white-collar experience, transition to blue-collar jobs. The results suggest that, although the PEP improves employment access, it does not fully address the quality mismatch between migrants' skills and available job opportunities. The findings underscore the importance of policy initiatives targeting skill development and matching migrants' qualifications with job market needs to enhance labor market integration and reduce inequality.

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

JEL Codes: F22, O15, J24, J61

*School of Economics, Universidad del Rosario, and GLO research fellow. Email: andres.garcia@urosario.edu.co.

†School of Economics, Universidad del Rosario. Email: angie.mondragon@urosario.edu.co.

‡Université Paris 1 Panthéon-Sorbonne. Email: alexandersarangoiturralde@outlook.com.

Errors, opinions and omissions are our own and do not represent our institutions. The authors have no relevant interest(s) to disclose.

We gratefully acknowledge the feedback received from participants at the Fedesarrollo Seminar in May 2024 in Bogotá, Colombia; the 2nd Annual Meeting of the Ecuadorian Economics Association in June 2024 in Cuenca, Ecuador; the 3rd Research Conference on Forced Displacement in September 2024; and the 4th International Conference on The Economics of Informality in December 2024 in Bogotá, Colombia.

1 Introduction

The economic and political crisis in Venezuela has triggered one of the largest and fastest migrations in the region, with over 5 million Venezuelans primarily relocating to neighboring countries, with Colombia being the most prominent destination (National Planning Department, 2022; Wolfe, 2021b). This exodus has posed significant challenges for the migrants, particularly in the labor market. Venezuelan migrants face structural and social barriers, such as the lack of recognition of their academic and professional credentials, discrimination, and a lack of labor networks that would allow them to fully integrate into the job market. (Danzer and Dietz, 2014; Męczyński, 2016; Liu et al., 2019).

In this regard, the Colombian government introduced work permits[1] for migrants as an initiative to ensure the integration of this group into the Colombian labor market, alongside other benefits such as access to healthcare and educational services. Labor market integration extends beyond reducing the unemployment rate or the wage gaps of migrants. In the medium term, reducing the misallocation of human capital can lead productivity gains. Otherwise, it may result in occupational downgrading, i.e., the loss of occupational status between the job that the migrant had in the country of origin and a lower-status job in the receiving country (Akresh, 2008; Chiswick and Miller, 2009; Crollard et al., 2012; Simón et al., 2014).

In this paper, we examine the impact of work permits on the labor market outcomes of migrants, contributing to several strands of literature on migrant labor markets and initiatives aimed at their effective integration into the host country. The literature on migrant labor market integration has primarily focused on barriers such as discrimination, recruitment processes, language proficiency, and the recognition of work credentials (Borjas, 2003; Kandel and Donato, 2009; Chiswick and Miller, 2009; Gagnon et al., 2014). Policies like naturalization and the ability to sign labor contracts have been identified as key factors in improving migrants' labor market outcomes (Riphahn and

[1] In the extant literature, this policy measure is also referred to interchangeably as an Amnesty Program for Undocumented Migrants, a Government Regularization Program, or, Work Permits.

Saif, 2018; Zhao and Tang, 2022). Work centers have also been suggested as solutions to reduce labor precariousness and facilitate regularization (Könönen, 2019; Zhang et al., 2021). A critical barrier is the lack of recognition of professional qualifications, leading highly skilled migrants to accept lower-status jobs, a phenomenon known as occupational downgrading (Ramboarison-Lalao et al., 2012; Schuster et al., 2013; Fernando and Patriotta, 2020; Buzzelli, 2025).

The causes of occupational downgrading are multifaceted. One explanation is that migrants' skills often yield lower returns due to limited information about the local labor market (Martín et al., 2016; Fellini and Guetto, 2019; OCDE, 2020), leading to an imperfect substitution between migrant and native workers with similar abilities (Lebow, 2022). Additionally, migrants frequently face a period of adaptation, often lacking pre-organized jobs (Brell et al., 2020; Fasani et al., 2022). This adaptation process aligns with the assimilation theory proposed by Simón et al. (2014), which posits that migrants initially occupy lower-status jobs and improve their occupational status over time as they accumulate human capital (see also Barbiano di Belgiojoso, 2019; Duleep et al., 2022; Nikolov et al., 2022).

Occupational downgrading has been measured from various perspectives. One approach focuses on education, where downgrading occurs when a worker's education level exceeds that required for the job (Chiswick and Miller, 2009; Piracha et al., 2023). Another perspective examines the type of occupation, where downgrading refers to a loss of occupational status, such as the transition from white-collar to blue-collar jobs (Crollard et al., 2012; Danzer and Dietz, 2014). Some studies, such as Ganzeboom and Treiman (1996), measure downgrading by combining income and education level. In this paper, we adopt the latter approach, defining occupational downgrading as the transition from white-collar to blue-collar occupations, using the International Standard Classification of Occupations (ISCO-88) classification.

This study contributes to the literature on the effects of amnesty programs for migrants, particularly focusing on occupational downgrading. Previous research has

shown that amnesty and regularization programs generally improve migrants' job access and quality of life (Kossoudji and Cobb-Clark, 2002; Amuedo-Dorantes and De la Rica, 2007; Monras et al., 2018). Specifically, in the context of Venezuelan migration to Colombia, Ibanez et al. (2022) found that work permits had a positive impact on Venezuelans' consumption, food security, income, access to safety nets, integration into Colombian society, and resilience to the COVID-19 crisis. Similarly, Lombardo et al. (2025) demonstrated that work permits in Colombia helped mitigate migrant downgrading, especially in terms of wages and the routinization of tasks performed in occupations.

Building on these insights, our study aims to further investigate the dynamics of work permits in labor market outcomes. We employ a difference-in-difference (DiD) approach combined with an inverse probability weighting (IPW) technique to address endogeneity concerns arising from the non-random assignment of work permits. A key contribution of this paper is the use of novel data to assess the impact of work permits on both labor market status and labor market quality in the host country. Labor market quality is measured through the transition between blue-collar and white-collar occupations, as well as changes in the routinization of tasks between Colombia and Venezuela. This type of analysis, which compares occupational changes by examining migrants' current jobs relative to their previous occupations, is rarely explored due to the lack of longitudinal data on migrants' pre-migration occupations (Simón et al., 2014).

Additionally, most studies have focused on comparing occupations and income between migrants and native workers with similar characteristics (see for instance Chiswick, 1978; Green, 1999; Izquierdo et al., 2009; Lombardo et al., 2025). Our research extends previous work by analyzing a broader range of work permit waves, enabling us to investigate the long-term effects of the PEP, in contrast to studies such as Bahar et al. (2018) and Lombardo et al. (2025), which primarily focus on short-term effects.

The results show that work permits significantly improve the labor market outcomes of Venezuelan migrants in Colombia, particularly by increasing employment, especially

in blue-collar jobs. However, the permits did not substantially reduce occupational downgrading, with many migrants shifting from white-collar to blue-collar occupations. Younger migrants and males benefitted more, experiencing higher formal employment rates. The analysis of routinization tasks revealed no significant reduction in routine task intensity, suggesting that while permits provided labor market access, they did not improve job quality. These findings highlight the need for complementary policies to better match migrants' skills with available job opportunities.

This paper is structured into six sections. Section 2 provides the context of Venezuelan migration and work permits in Colombia. Section 3 describes the primary data source. Section 4 outlines the methodology, including models and estimations. Section 5 presents the main findings, heterogeneous effects and discusses the potential mechanisms. Finally, Section 6 offers concluding remarks.

2 Permits for migrants in Colombia

Since 2014, the Venezuelan economy has experienced a sharp economic contraction (OECD, 2018; Lombardo et al., 2025; Alhadeff, 2021), , compounded by soaring inflation and widespread shortages of essential goods (Ramoni Perazzi et al., 2017; Caruso et al., 2021). This combination of factors triggered a massive exodus of Venezuelans, marking an unprecedented migration 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).

Venezuela and Colombia share not only geographic proximity but also historical and cultural ties, including Spanish as their official language and similar linguistic traditions, particularly in border regions (Orozco and Campos, 2015; Brill, 2017). These commonalities contribute to relatively smoother cultural and social integration processes.

However, despite these affinities, the two countries differ markedly in the structure and dynamics of their labor markets. Venezuela's prolonged economic and institutional crisis has led to the collapse of formal employment systems and professional mobility pathways.

In contrast, Colombia, although facing persistent challenges related to informality and unemployment, maintains more stable labor institutions and clearer mechanisms for job matching. These contrasts may partly explain the occupational downgrading experienced by Venezuelan migrants, as their prior labor market experience may not align with the institutional and structural requirements of the Colombian labor market.

The educational systems in both countries present structural similarities. Venezuela and Colombia share equivalent levels of basic, secondary, and tertiary education, with broadly comparable curricula, particularly at the primary and secondary stages. This similarity supports the assumption that educational attainment is largely transferable across borders in terms of formal recognition and expected competencies. Consequently, it would be reasonable to expect that Venezuelan migrants with equivalent qualifications and experience could access jobs in Colombia similar to those they held in their country of origin.

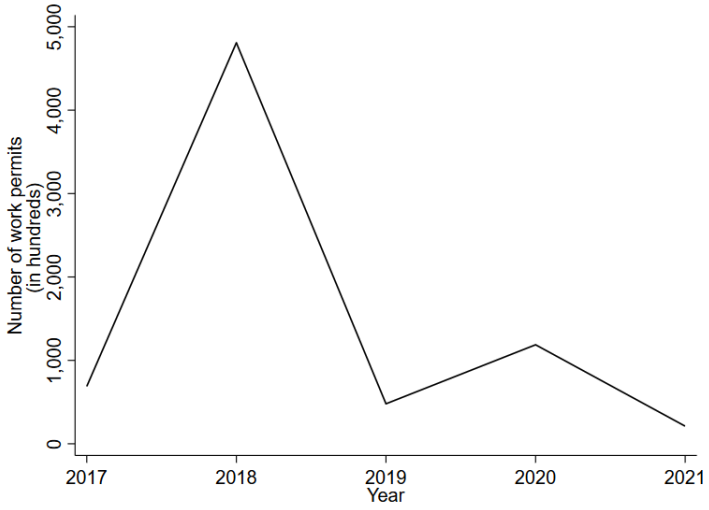
Nonetheless, our findings suggest that the occupational transitions observed may not be driven solely by the migratory process itself. Rather, they may also reflect the cumulative effects of Venezuela's socioeconomic collapse, which likely disrupted the professional development and labor trajectories of migrants prior to their arrival in Colombia.

To mitigate some of these disadvantages and facilitate labor market integration, the Colombian government introduced a series of regularization policies. In response to the massive migration, in July 2017 it created a residence permit called Permiso Especial de Permanencia (PEP). To apply for the PEP, migrants had to meet specific criteria: hold Venezuelan nationality, enter Colombia with a stamped passport (a requirement later dropped in August 2018), have no criminal record, and not be subject to expulsion or

deportation orders. This renewable two-year permit granted access to public services such as education, healthcare, and childcare, as well as formal employment.

The PEP was issued in nine waves between July 2017 and March 2021, ultimately benefiting 724,083 migrants. Figure 1 shows the number of granted work permits by year between 2017 and 2019. Notably, 2018 saw the highest issuance, as the Colombian government expanded registration efforts and increased access points for migrants to apply.

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.

It is important to clarify the distinction between the Permiso Especial de Permanencia (PEP) and the Permiso por Protección Temporal (PPT), two residence and work authorization mechanisms implemented by the Colombian government in response to the Venezuelan migration crisis. The PEP was introduced in 2017 and granted legal status to Venezuelan migrants who had entered the country regularly, offering access to healthcare, education, and formal employment. It was issued in nine waves until March 2021. In contrast, the PPT was established in early 2021 as a broader and more permanent regularization strategy, aimed at integrating a larger population of undocumented migrants, including those without prior PEP eligibility.

While both permits serve similar integration purposes, they differ in scope, requirements, and issuance processes. In our analysis, we focus exclusively on PEP holders, as the Migration Pulse Survey (EPM, for its acronym in Spanish) survey covers data from 2021 to early 2022, a period during which the PPT was still being implemented and had limited representation in the sample. As such, our estimates reflect the labor market outcomes associated with the PEP, and not the PPT. The exclusion of PPT holders minimizes potential overlap but also implies that our findings may not capture the full impact of more recent regularization efforts. Future research could explore the comparative effects of both permits once more comprehensive data becomes available.

3 Data

The main two sources of information correspond to household surveys. The first source is a specialized survey targeting Venezuelan migrants and the second is the traditional household survey, which provides additional information about individual characteristics such as gender, education and age. In particular we use novel data from the EPM, which is a dataset designed and administered by the National Administrative Department of Statistics (DANE) in collaboration with the Universidad del Rosario and the World Bank. This survey offers unique insights into the sociodemographic and labor characteristics of Venezuelan migrants in Colombia. More specifically, it includes detailed information on the labor trajectories of migrants in Colombia. Notably, EPM gathers detailed information on the labor market conditions faced by Venezuelan migrants both before migration (in Venezuela) and after their arrival in Colombia. This dual-level data structure enables a robust analysis of the changes in labor conditions that migrants experience before and after migration, providing valuable information on their labor market integration process.

The sample consists of households with at least one Venezuelan migrant, which corresponds to approximately four thousand households per survey wave. The sample selection is based on all households and individuals identified in the Great Integrated

Household Survey (GEIH)[2] that meet the defined characteristic in the target population, specifically those households with at least one migrant aged 15 or older. Migrants born in Colombia or those with dual nationality are excluded from the analysis, as they have access to Colombian citizenship and do not require work permits.

The sample consists of 12,510 migrants from 5,759 households across four waves. Due to attrition[3] and the fact that the question concerning labor conditions in Venezuela was only asked in round 2. As a result, we have data from 4,300 Venezuelans who provided relevant information for the study, including labor conditions in both Venezuela and Colombia, PEP holder status, and the control variables specified in the methodology section. This yields approximately 6,800 observations, as our database structure for the difference-in-differences analysis requires data both before and after migration.

The EPM provides information on whether an individual holds a PEP and the date the permit was granted. In addition, this survey offers data on three types of labor outcomes for migrants both before and after migration: employment status and job quality. For employment status, we compare whether the migrant was employed, unemployed, or out of the labor force. In the case of Venezuela, we consider the primary activity the migrant engaged in for the majority of their time prior to migrating, while for their post-migration status, we use the activity they were involved in during the last seven days.[4]

In terms of job quality outcomes, we use two variables: an indicator for whether the job is a white-collar occupation (formal) or not, and the routinization task index of Mihaylov and Tijdens (2019). To determine whether a job is classified as white-collar, we

[2]In Round 1, the sample was drawn from GEIH respondents between January and June 2021. In Round 2, to maintain the sample size (4,000 households), data was refreshed using respondents from June to August 2021. Round 3 updated the sample with respondents from August to October 2021, and the final round used data from November and December 2021.

[3]DANE reported attrition rates of 18.5%, 33.9%, and 47.3% in rounds 2, 3, and 4, respectively. Only 3,662 individuals completed the survey across all four rounds. DANE refreshed the sample in each subsequent wave by adding households with the same demographic structure as the original round

[4]We use the response from the most recent round in which the respondent participated to ensure the most up-to-date information.

use the occupation code provided by the EPM and map its equivalent in the ISCO-88[5] at the one-digit level. That is, We define a white-collar job as a dummy variable taking the value of one if the individual holds an occupation coded between 1 and 5, and zero otherwise. To assess whether employment is formal or informal, we rely on the question about whether the individual has a written contract as a proxy for formality. This is the closest measure available in the EPM to capture the formality of migrant employment in Venezuela. This approach provides novel insights into the labor conditions of Venezuelan migrants, emphasizing the difficulties they encounter in accessing formal employment opportunities.

An addtional piece of information corresponds to the routinization task-intensity (RTI) index from Mihaylov and Tijdens (2019). This is a measure of the task content of occupations, based on the ISCO-08. The authors classify tasks as either routine or non-routine, with each category containing distinct components, allowing for a more granular breakdown of the index. The RTI of each occupation is determined based on whether tasks can be replaced by computer-controlled technology and whether they involve cognitive or manual skills. Further details are provided in section 4. This index allows us to account the nature of the work, particularly the levels of complexity, creativity, and autonomy associated with each occupation. Jobs characterized by routine tasks tend to be more susceptible to automation and typically offer fewer opportunities for professional advancement and personal development. In contrast, occupations involving non-routine tasks demand more complex cognitive and manual skills.

To analyze the key characteristics of the population and gain insights into job downgrading and its relationship with the possession of work permits, in Table 1 we compare several sociodemographic characteristics. The first panel displays

[5]Armed forces are excluded. Detailed information on the ISCO-88 classification can be found at https://www.eurofound.europa.eu/en/coding-and-classification-standards-0. ISCO-88 considers the following 10 groups: (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. The latter group is excluded in our analysis.

sociodemographic characteristics, the second panel shows employment status and job quality variables, and the third panel presents the average RTI and its components. Our calculations also distinguish between two major groups: those employed in white-collar jobs and those in blue-collar jobs in Venezuela. Within each group, we compare the values for individuals who held a PEP and those who did not, assessing whether the differences between these subgroups are statistically significant.

Table 1: Descriptive statistics of white and blue workers

	White-collar in Venezuela			Blue-collar in Venezuela		
	(1) Non-PEP	(2) PEP	(3) Diff.	(4) Non-PEP	(5) PEP	(6) Diff.
Employed [=1]†	65.2	73.8	-8.6***	74.2	82.7	-8.5***
White-collar [=1]†	62.7	59.3	3.4	22.5	27.2	-4.6
Formal job [=1]†	3.5	5.8	-2.3	3.1	6.5	-3.4
Unemployed [=1]†	11.7	10.2	1.6	12.1	8.9	3.2
Out of the labor force [=1]†	23.1	16.0	7.1***	13.8	8.4	5.3**
Hourly wage†	3.60	4.82	-1.22***	3.63	4.34	-0.71***
Average RTI	-0.646	-0.579	-0.067	-0.582	-0.582	0.000
Routine Cognitive	0.100	0.098	0.002	0.165	0.158	0.008
Routine Manual	0.077	0.112	-0.036*	0.044	0.051	-0.008
Non-Routine Analytic	0.037	0.028	0.009	0.064	0.098	-0.035**
Non-Routine Interactive	0.093	0.082	0.011	0.168	0.139	0.028**
Non-Routine Manual	0.692	0.677	0.015	0.566	0.564	0.001
Female [=1]	58.2	55.9	2.2	28.2	23.8	0.043
Age	36.7	35.6	1.1*	38.4	37.0	1.4
Married or cohabiting [=1]	70.5	70.5	-0.0	71.2	74.3	-3.1
High education [=1]	26.0	46.9	-20.9***	10.7	15.9	-5.2*
Urban [=1]	95.9	97.1	-1.2	92.2	95.8	-3.6*
Years in Colombia	3.7	3.8	-0.01	3.6	3.7	-0.1
Migrated because of family reasons [=1]	12.2	10.1	2.1	8.7	7.9	0.8
Difficulty finding a job [=1]	69.1	65.4	3.7	67.4	71.1	-3.7
Job training [=1]	1.5	6.8	-5.3***	0.8	5.2	-4.4***
N	1,303	413	890	1,076	214	862
N (%)	75.93	24.07	51.86	83.41	16.59	66.82

Notes: Table is based on data from the second wave, which includes a larger number of observations. † These labor market outcomes correspond to those in Colombia. Hourly wages are expressed in USD, calculated using the average exchange rate (TRM) for the months corresponding to the waves analyzed in this study. Source: Authors' calculations using EPM data.

The results reveal some differences between individuals holding a PEP and those who do not. For instance, migrants with a PEP generally exhibit higher employment rates and participation rates. Notably, among PEP holders, those who were previously employed in blue-collar occupations in Venezuela display a higher employment rate (82.7%) than

their counterparts from white-collar backgrounds (73.8%). As expected, individuals who were white-collar workers in Venezuela are more likely to remain in white-collar positions in Colombia. However, within this group, a slightly higher share of individuals without a PEP (62.7%) remain in white-collar roles in Colombia, compared to those with a PEP (59.3%). Although these percentages are high, the results indicate the presence of job downgrading. Moreover, this suggests that maintaining white-collar status is slightly more common among non-PEP holders, whereas upward occupational mobility from blue-collar to white-collar jobs appears more prevalent among PEP holders.

Regarding labor formality, while migrants with a PEP are more likely to be formally employed, this difference is particularly pronounced among those who were blue-collar workers in Venezuela. Migrants without a PEP are more likely to be unemployed or out of the labor force in Colombia. Although hourly wage is not a primary outcome in this study—due to the lack of pre-migration wage data, we present evidence suggesting that PEP holders in Colombia earn significantly more than non-holders.

As detailed in Section 4, the RTI components reflect the average share of tasks by type. For example, former white-collar Venezuelan workers in Colombia with a PEP perform 11% of their tasks as routine-manual, significantly higher than the 7% observed among non-PEP holders. Meanwhile, non-PEP holders perform slightly more non-routine tasks, though these differences are not statistically significant. The average RTI index for migrants in Colombia is negative, indicating a tendency toward non-routine occupations. Interestingly, PEP holders engage more in cognitively routine tasks, while those performing higher shares of manually routine tasks are former white-collar workers in Venezuela who currently hold a PEP in Colombia (11.2%). Moreover, former white-collar migrants with a PEP in Colombia perform a significantly higher share of non-routine analytic tasks (9.8%) compared to those without a PEP (6.4%).

Finally, no statistically significant differences are found in gender, marital status, urban residence, or years of residence in Colombia. However, PEP holders tend to have higher levels of education and job-related training compared to their non-PEP

counterparts.

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 of the EPM to compare the occupational status of migrants with and without permits. In order 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 PEP.

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. The main concern regarding self-selection stems from the fact that migrants decide to apply for work permits based on various factors, such as eligibility and personal circumstances, which may lead to non-random assignment into the treatment group. This could introduce selection bias, as migrants with work permits may differ systematically from those without them in ways that affect their labor market outcomes. The IPW methodology helps mitigate this bias by weighting individuals according to the inverse of their probability of receiving a work permit, conditional on a set of observed control variables. This approach balances the comparison groups (migrants with and without permits) and corrects for differences in observable characteristics (Wei et al., 2023; Sant'Anna and Zhao, 2020). By incorporating this method, we improve the validity of our causal inferences, addressing endogeneity concerns related to the non-random assignment of work permits.

Thus, IPW, in combination with the differences-in-differences specification, provides a robust framework for estimating the causal effects of work permits on labor market outcomes. The methodology not only corrects for selection bias but also improves the

covariate balance between treated and control groups, allowing for a more accurate assessment of the impact of work permits on migrant labor integration. This approach yields a doubly robust estimator allowing to address selection into treatment and unobserved time-invariant characteristics.

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

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

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). PEP 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 when the individual is observed in Colombia and when observed in Venezuela.

X_{idt} is a vector of individual characteristics that includes gender, age, education, urban residence, duration of stay in the host country, migration reason (family-related or otherwise), and sector of occupation.[6] 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. Given the small number of clusters (23 departments), we adjust our statistical inference by using cluster-robust wild bootstrap p-values.[7] The estimates are weighted using the inverse probability of being a permit holder, which is estimated using the same set of control variables.

[6]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. Sector of occupation classified using one-digit CIIU codes.

[7]For a detailed discussion of the issues arising from a small number of clusters, refer to Cameron et al. (2008), and for corrections, see Roodman et al. (2019) also employed by Bahar et al. (2021)

Considering the possible employment statuses in both Venezuela and Colombia, our analysis focuses on a transition matrix, where each entry represents a combination of origin and destination states. This means 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 gender and age.

To assess the impact of work permits on the routinization of migrant occupations, we estimate Equation 1 for the RTI index as dependent variable, as shown in Equation 2. The RTI value is assigned to each occupation at the four-digit level. As outlined in Equation 3, the RTI is derived from five distinct components.

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

Where:

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

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. The routinization index considers the percentage of tasks assigned to each task group (RC, RM, NRA, NRI, NRM) based on the work activities involved. Therefore, the RTI takes values between -1 and 1, where a value of 1 indicates that occupation k involves only routine tasks, and -1 indicates that occupation k involves only non-routine tasks.

Table 2 outlines the tasks for each group (RC, RM, NRA, NRI) and examples of occupations. RC tasks involve following well-defined rules, such as data entry, filing, or

handling incoming calls. RM tasks require physical skills and repetitive actions, such as operating machinery, assembling products, or performing maintenance. NRA tasks involve critical thinking, problem-solving, and decision-making skills that are difficult to automate, such as research, analysis, strategic planning, and project management. These tasks require cognitive flexibility, analytical reasoning, and the ability to adapt to changing or novel challenges. NRI tasks, on the other hand, require interpersonal skills and emotional intelligence, including advising, negotiating, teaching, and customer service, which involve effective communication, active listening, and empathy. Lasly, NRM tasks involve physical skills, creativity, and adaptability that cannot be easily automated, such as construction, repair, personal care services, and culinary arts. These tasks require hands-on skills, craftsmanship, and individualized approaches, reflecting the need for manual expertise. We estimate Equation 2 separately for each of the five components of the RTI index as the outcome of interest to analyze the impact of work permits on routinization in detail.

Table 2: Tasks required and example for each component of the RTI

Task groups	Sign	Tasks required	Example
RC	+	Following well-defined rules and procedures, attention to detail, organization.	Data entry, record keeping, filing documents, ordering supplies, handling incoming calls.
RM	+	Following established procedures, physical skills, repetitive actions	Operating machinery, assembling products, packing and labeling, cleaning, and maintenance, tasks operating vehicles, performing repetitive
NRA	–	Critical thinking, analytical reasoning, problem, -solving and decision-making skills that cannot be easily automated or programmed.	Fesearch and analysis, strategic planning, project management, data interpretation, problem-solving
NRI	–	Interpersonal skills, communication abilities, and emotional intelligence	Advising and counseling, negotiating, teaching, customer service
NRM	–	Physical or hands-on skills, creativity, and adaptability that are not easily automated or standardized	Building and construction, repair and maintenance, personal care services, customized production culinary arts, manual therapy

Notes: The table summarizes various task categories and examples based on the groups proposed by (Mihaylov and Tijdens, 2019): routine cognitive (RC), routine manual (RM), non-routine analytic (NRA), non-routine interactive (NRI), and non-routine manual (NRM).

5 Results

We examine the occupational transitions of migrants using both descriptive evidence and causal inference. For the descriptive analysis, we explore changes in occupational status through transition matrices without controlling for migrant characteristics. This approach enables us to identify key patterns, which can subsequently be validated through regression analysis. Additionally, we quantify how these transitions are influenced by the possession of work permits, using a difference-in-differences identification strategy combined with Inverse Probability Weighting.

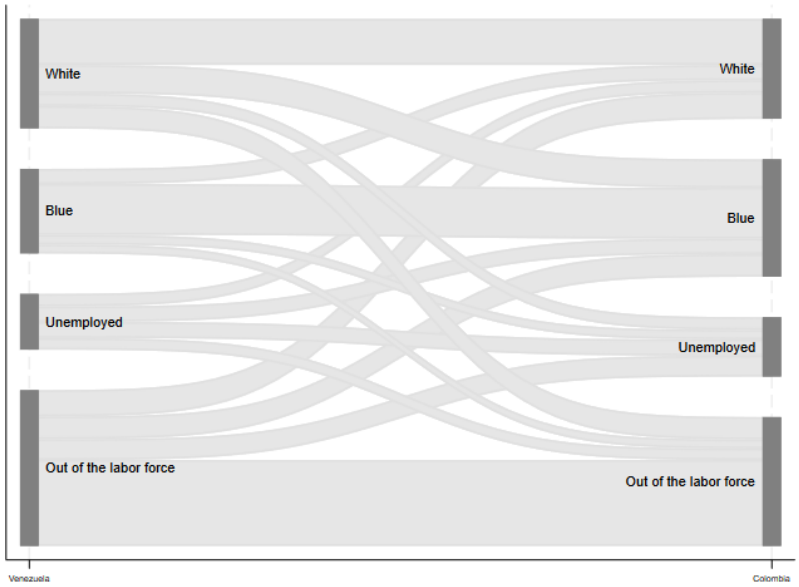
5.1 Description of the occupation status transitions

In this descriptive section, we analyze the occupational trajectory of migrants before and after migration. Occupational status is categorized into four groups: employed in white-collar jobs, employed in blue-collar jobs, unemployed, and out of the labor force. Figure 2 presents the transitions between the predominant occupational status in Venezuela and the current status in Colombia. A notable shift in the occupational structure is observed, with a significant decrease in the proportion of migrants employed in white-collar jobs in Colombia, alongside a rise in those holding blue-collar jobs. This shift is also accompanied by a considerable reduction in the proportion of individuals outside the labor force.

Notably, among migrants transitioning from white-collar jobs in Venezuela, nearly half (43%) were employed in blue-collar jobs in Colombia, highlighting a prevalent trend of occupational downgrading. In fact an increase in the proportion of blue-collar workers is observed among migrants who were previously employed in white-collar jobs, unemployed, or out of the labor force in Venezuela. This indicates that the necessity for income generation drives migrants towards lower-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 findings indicate a substantial entry of migrants into the labor market,

albeit with a potential downgrade in the type of occupation held.

Figure 2: Change in 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.

Among those who remained in blue-collar jobs, only 10% have an education level beyond high school. In contrast, among those who experienced an upgrading from blue-collar to white-collar jobs, the proportion of individuals with education beyond high school rises to 16%. This higher educational attainment among those who transitioned to white-collar occupations may indicate that education plays a crucial role in facilitating upward mobility in the labor market.

Table 3 illustrates the sectoral distribution of Venezuelan migrants who remained in blue-collar jobs in Colombia versus those who transitioned to white-collar positions. It is shown that migrants in blue-collar jobs are predominantly concentrated in wholesale and retail trade (19.13%), which also remains a key sector for those who transitioned to white-collar jobs (19.01%). A substantial difference is the higher representation of migrants in manufacturing among those who upgraded to white-collar

jobs (14.94%) compared to those who stayed in blue-collar roles (17.87%). Therefore is observed a upward mobility within more skilled sectors. Overall, while key sectors like manufacturing, transport, and commerce continue to dominate for blue-collar workers, a significant portion of migrants experience upward mobility in sectors such as manufacturing and services.

Table 3: Sector distribution of workers in Venezuela who remained in blue-collar jobs and those who upgraded from blue-collar to white-collar jobs in Colombia

Sector	Remained blue-collar	Upgraded to white-collar
Wholesale and Retail Trade	19.13	19.01
Transportation and Storage	13.62	17.14
Manufacturing Industries	17.87	14.94
Construction	20.94	12.37
Accommodation and Food Services	7.73	7.27
Household Activities	5.22	8.55
Administrative Services Activities	2.71	3.38
Agriculture, Livestock, Hunting, Forestry	9.79	2.43
Information and Communications	1.77	2.87
Public Administration and Defense; Planning	0.39	2.55
Health Care Activities	0.53	1.91
Education	0.62	1.91
Artistic and Entertainment Activities	0.29	1.15
Real Estate Activities	0.35	1.15
Mining and Quarrying	0.82	0.64
Water Distribution; Wastewater and Waste Treatment	0.45	0.64
Electricity, Gas, Steam Supply	1.64	0.64
Other Service Activities	2.63	0.90
N	4,862	1,568

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

On the other hand, the first job in the destination country plays a crucial role, as it represents the initial point of contact with the labor market. The data provided by the EPM survey enables a more detailed characterization of labor market outcomes for migrants in the transition from Venezuela to Colombia. While our focus is on assessing the impact of work permits on medium-term labor market outcomes, we also analyze the first job in Colombia, as initial labor conditions can significantly influence the migrants' subsequent career trajectory. Figure 3 presents the probabilities of transitioning from occupational status in Venezuela to the first job in Colombia. A relatively higher prevalence of blue-collar jobs (53%) is observed in Colombia. In fact, a significant proportion of both the unemployed and white-collar workers in Venezuela

(41%) transitioned to blue-collar jobs. This reveals that occupational downgrading persists in Colombia, from the first job to subsequent ones. However, we do not use the first job as our main outcome, as migrants typically do not obtain the PEP (Permiso Especial de Permanencia) immediately, and the sample of individuals with the PEP in their first job is too small to adequately evaluate its impact on occupational change.

Figure 3: Change in occupational status from Venezuela to the first job in 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 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 analyzed transition probabilities, but we have not yet assessed the extent to which these transitions are influenced by migrant characteristics. It is well established that labor market outcomes are shaped by various migrant attributes, including the opportunity cost of unemployment and the social and cultural context, which influence the likelihood of being employed. To shed light on this, we estimate transition matrices by gender and age group. Figure A.1 compares the results for men and women, showing that both groups exhibit similar behaviors, with men displaying a higher propensity for occupational downgrading.

Interestingly, we also observe that the most frequent transition for women is from white-collar jobs to exiting the labor force in Colombia. Approximately 17% of female migrants who had white-collar jobs in Venezuela transitioned to being out of the labor force in Colombia, compared to just 3% for male workers. These findings may be explained by gender norms and structural constraints related to employment. Specifically, the division of household labor, limited access to childcare, and the loss of social capital built in Venezuela could explain these outcomes, as suggested by Ressia et al. (2016). Moreover, older women may have encountered challenges in updating their skills due to caregiving responsibilities.

Further examining age group differences, we find that adult migrants are the most affected by occupational downgrading (see Figure A.2). Around 16% of the youngest migrants transitioned from white-collar jobs to exiting the labor force. In contrast, this percentage rises to 24% for adults, indicating that older migrants face more barriers in entering the labor market. Additionally, within this group, women over 34 years old experience more challenges remaining in the workforce. These results align with Ballarino and Panichella (2017), which suggests that difficulties in certifying competencies, limited networks, and age and gender discrimination contribute to the lower employment rates among older women. Among younger workers, we observe an increase in the share of white-collar workers in Colombia, as well as a reduction in the share of workers exiting the labor force.

To gain preliminary insights into the influence of work permits on occupational changes, we differentiate between migrants with and without work permits. According to Figure A.3, most migrants holding work permits were already employed in Venezuela, and this proportion increased slightly in Colombia. However, this increase coincides with occupational downgrading, as the majority of the increase in employment is concentrated in blue-collar jobs. In contrast, for migrants without a work permit, there is no significant change in their employment rate in Colombia. This provides evidence that work permits may facilitate labor market insertion, creating an employment premium, though they do

not appear to enable migrants to secure jobs at the same qualification levels as before.

While our measure of occupational downgrading compares employment between Venezuela and Colombia, the EPM survey also offers valuable insights into the labor trajectories of migrants after arriving in Colombia. In particular, transitions in employment status before and after obtaining a work permit are shown in Figure A.4. This allows us to test 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 tenure of work permits may have differential effects by population groups. To explore this further, we analyze labor market transitions by population groups. The results indicate a compositional effect for men, with a significant increase in blue-collar jobs (see Figure A.5). Conversely, among women, a more pronounced increase is observed in the proportion of white-collar workers. Regarding age (see Figure A.6), the employment rate rises for both groups, with young individuals primarily contributing to the increase in white-collar jobs and a reduction in the proportion of the unemployed. This implies that permit tenure is indeed related to changes in occupational status. However, to establish a causal relationship, a strategy is needed to estimate an appropriate control group, as those with work permits are predominantly employed at higher education levels.

Given the relationship between job quality and occupational downgrading, we develop an approximation of informality status. Based on the available data, the best possible proxy is the type of employment contract. Therefore, we compare the change in the probability of having a verbal or written contract between employment in Venezuela and in Colombia. Figure 4 illustrates the change in employment formality between the best job held in Venezuela and the most recent job reported by migrants in the EPM. We observe that while formal (written) and informal (verbal) contracts were relatively evenly distributed in Venezuela, upon migrating to Colombia, individuals predominantly held informal (verbal) contracts. This additional evidence suggests a significant decline in job quality; therefore, we further examine this aspect of employment.

Figure 4: Change of formal status from Venezuela to Colombia

Notes: The left axis corresponds to whether the migrant had a written or verbal contract in their best job in Venezuela. The right axis indicates whether the migrant had a written or verbal contract in Colombia (at the time of their most recent survey). *Source*: Own calculations using EPM data.

5.2 Impact of the PEP 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 4 presents the results for all possible labor market transitions. Overall, we find that holding the PEP significantly decreases the likelihood of being out of the labor force by 11.9 percentage points, but this effect is only observed among migrants who

were previously unemployed in Venezuela (Panel C, Column 6). To better understand the differential impacts of work permits on labor market outcomes, we also examine heterogeneous effects across key demographic and socio-economic groups. Specifically, we analyze how the effects of the PEP vary by migration period, age groups, and education levels. Analyzing these groups allow us to explore whether certain segments of the migrant population experience different labor market transitions or face unique barriers to integration.

Table 4: Impact of work permits on labor market outcomes of migrants

	(1)	(2)	(3)	(4)	(6)
Variables	Employed	White-collar job	Formal	Unemployed	Out of the labor force
Panel A. Migrants who were *white-collar* in Venezuela					
PEP x T	0.018	-0.031	-0.020	0.011	-0.029
	(0.021)	(0.033)	(0.037)	(0.015)	(0.025)
Observations	2,813	2,197	2,139	2,813	2,813
R-squared	0.352	0.471	0.303	0.113	0.278
Panel B. Migrants who were *blue-collar* in Venezuela					
PEP x T	0.036	0.008	0.002	0.000	-0.036
	(0.040)	(0.050)	(0.046)	(0.027)	(0.038)
Observations	2,070	1,701	1,644	2,070	2,070
R-squared	0.282	0.285	0.208	0.122	0.257
Panel C. Migrants who were unemployed in Venezuela					
PEP x T	0.151	-0.036	-0.031	-0.032	-0.119**
	(0.094)	(0.066)	(0.089)	(0.049)	(0.053)
Observations	937	699	651	937	937
R-squared	0.605	0.526	0.411	0.796	0.265
Panel D. Migrants who were out of the labor force in Venezuela					
PEP x T	0.025	0.000	-0.011	-0.018	-0.007
	(0.041)	(0.072)	(0.073)	(0.032)	(0.030)
Observations	3,274	2,087	1,054	3,274	3,274
R-squared	0.446	0.684	0.315	0.101	0.490

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Tables B.1 to B.4 shows the heterogeneous effects to each group of migrants. Table B.1 shows that for male migrants who were previously employed in white-collar jobs in Venezuela, holding the PEP reduces the likelihood of formal employment by 10.6 percentage points, highlighting the complex dynamics of labor market integration for male migrants with prior white-collar experience. Additionally, for less-educated migrants who previously held white-collar jobs in Venezuela, the PEP reduces the likelihood of being out of the labor force by 5.2 percentage points, further illustrating the diverse labor market outcomes of work permits across different migrant subgroups.

On the other hand, Table B.2 also shows that, even with the PEP, the labor market presents challenges for women. For the sample of female migrants who were previously employed in blue-collar jobs in Venezuela, the PEP reduces the likelihood of holding a white-collar job in Colombia by 22.3 percentage points. This decrease suggests that, for this group of women, the PEP does not facilitate upward mobility into higher-skilled jobs. These findings highlight the persistence of gender inequalities in the labor market, even with migration regularization. Similarly, our the results indicate that the PEP is more beneficial for younger migrants who were blue-collar workers in Venezuela, as it increases their probability of being employed in Colombia by 8.2 percentage points and reduces the likelihood of being unemployed in Colombia by 6.8 percentage points.

According to Table B.3, the effects of the PEP are more pronounced for the group of migrants who were unemployed in Venezuela. For instance, work permits increase the probability of formal employment by 14.2 percentage points for women, while for men, they raise the likelihood of being employed by 11.2 percentage points and reduce the probability of being out of the labor force by 3.2 percentage points. Additionally, for younger migrants, the PEP reduces the probability of being out of the labor force in Colombia by 17.8 percentage points. Less-educated migrants benefit the most from the PEP, as it helps increase their probability of formal employment by 21.4 percentage points and reduces their likelihood of being out of the labor force in Colombia by 16.6 percentage points.

Finally, Table B.4 shows that, for the sample of migrants who were previously out of the labor force in Venezuela, the PEP has a significant impact only for men, reducing their probability of being unemployed by 8.5 percentage points. 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, and mitigate consequences of human capital misallocation.

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

5.3 Impact of the PEP on routinization of tasks

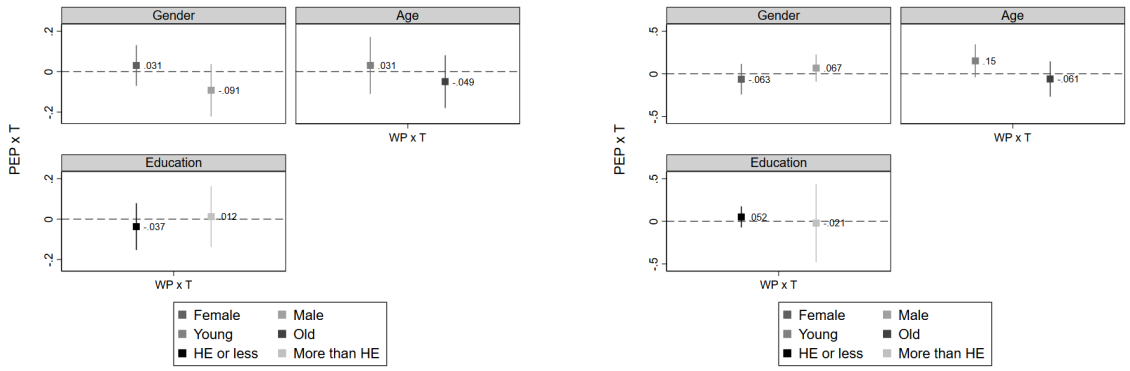
In this section, we examine the impact of PEP on routinization of tasks, measured through the RTI index. We conduct this analysis recognizing that, within the broad white-collar and blue-collar categories discussed in the previous section, there may be important heterogeneities across occupations. These differences could meaningfully influence observed outcomes. Therefore, it is essential to examine how the PEP affects the distribution of migrants across different types of occupational tasks.

By analyzing the effect of the PEP on the RTI index, we aim to assess how the

regularization of migrants' legal status influences their participation in tasks that require routine skills, as opposed to those demanding more cognitive and interpersonal abilities. This analysis is crucial for understanding the broader effects of work permits on labor market dynamics, as it sheds light on whether regularized migrants are more likely to be employed in jobs with greater automation potential or if they manage to secure positions that involve higher-skilled, non-routine tasks.

Studies that differentiate occupations often rely on the RTI index, which ranks occupations based on their risk of automation. According to Figure 5 overall there is no evidence that the work permit is related to access to jobs with high levels of RTI (see Table C.1). However, we observe interesting results when this sample is disaggregated by gender, age, and education groups. Figure 6 shows that the PEP leads to a reduction in the proportion of routine cognitive tasks for male migrants who were previously employed in white-collar jobs in Venezuela (Table C.2, panel B). This indicates that, with the PEP, these male migrants tend to transition into jobs that involve fewer routine tasks and more non-routine or cognitively complex tasks. This shift may reflect better integration into the formal labor market, where employers increasingly seek skills that are less susceptible to automation, thereby facilitating mobility into roles that require decision-making, analysis, and problem-solving.

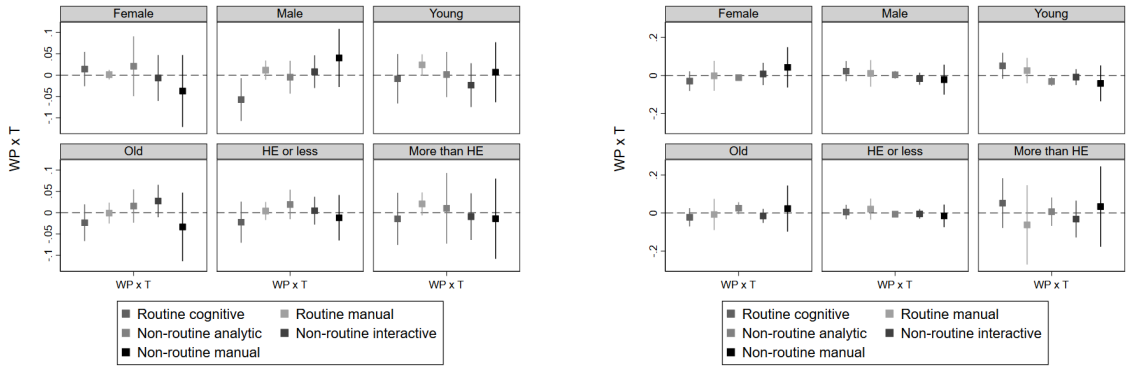
Figure 5: Impact of work permit on RTI



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

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

Figure 6: 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.

Additionally, for younger migrants who were previously employed in blue-collar jobs in Venezuela, the PEP reduces their likelihood of engaging in non-routine analytic tasks by 3.3 percentage points (Table C.3, panel C). This means that younger migrants are less likely to transition into jobs requiring higher-level cognitive tasks such as analysis and strategic thinking. This could reflect a variety of factors, such as limited access to education, professional networks, or skill recognition in Colombia. The reduction in the probability of transitioning into analytic tasks may also indicate that while the PEP facilitates labor market entry, it does not fully address the barriers to upward occupational mobility, especially for migrants from lower-skilled backgrounds. As a result, these migrants might remain in positions with more routine and less cognitively demanding tasks, highlighting the need for additional policies targeting skill development and labor market integration.

Therefore, it can be argue that work permits enable male and younger migrants to transition into more manual jobs compared to their previous occupations in Venezuela. This can be attributed to the sectors where non-routine manual jobs are predominantly concentrated such as construction, personal care services, repair, and maintenance, which have a high demand for migrant labor in Colombia. However, due to the associated risks and the need for insurance, work permits are required in these sectors.

Conversely, the negative impact of work permits on non-routine analytic and interactive occupations among younger migrants who previously held blue-collar jobs in Venezuela might indicate that, despite the availability of work permits, it remains challenging for younger migrants to transition into non-routine, higher-skilled roles. This can be explained by factors such as discrimination (Janta et al., 2011). Additionally, research suggests that wage loss, anxiety, and fear can negatively impact their mental and physical well-being, which in turn can hinder their ability to engage in interactive tasks (Singh and sharma, 2022; Joshi et al., 2011; Daly et al., 2019).

5.4 Potential mechanisms

This section explores the factors that could explain the labor market outcomes observed in relation to work permits. It is important to note that this analysis is purely correlational, and therefore, the results should not be interpreted as causal. Rather, they provide suggestive evidence that aligns with the broader findings of the paper. Work permits may reduce barriers to labor market access or facilitate integration processes, potentially influencing outcomes such as formal employment. Migrants with work permits may be more likely to use formal job search channels, have better access to job training, and engage in title homologation processes, all of which could improve their labor market outcomes.

EPM allows us to measure some of these aspects, enabling us to investigate how they mediate the impact of work permits on labor status. To assess this, we conduct a counterfactual analysis comparing migrants with and without work permits using an OLS specification. The control variables in this analysis are consistent with those used in Equation 1, ensuring a coherent comparison between the two groups. This approach allows us to determine, for example, the extent to which the use of formal job search channels may mediate the effects of work permits on labor market outcomes.

Our findings in Table 5 indicate that work permits are correlated with a higher

likelihood of receiving information about formal jobs, participating in job training, and identifying with Colombian culture, all of which may help mitigate occupational downgrading and improve employment status. These mechanisms underscore the potential role of work permits in enhancing labor market integration, although further research is needed to establish causal links. While the evidence is suggestive, it highlights the importance of integrating labor market mechanisms that support skill development and provide access to formal employment opportunities. Although work permits contribute to improving labor market outcomes, they do not entirely eliminate the issue of occupational downgrading, indicating the need for complementary policies that better align migrants' skills with available job opportunities.

Table 5: 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
PEP	-0.022	0.111*	-0.251	-0.030	0.005	-0.017	0.054**	0.028	0.053**
	(0.029)	(0.063)	(0.294)	(0.027)	(0.017)	(0.018)	(0.025)	(0.018)	(0.022)
Observations	4,596	920	6,914	6,914	6,910	6,882	6,718	2,752	4,066
R-squared	0.301	0.589	0.275	0.397	0.238	0.193	0.257	0.584	0.304

Notes: The estimates include the same controls described in Equation 1. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

Table 5 evidences that work permits have a positive correlation 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. 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., 2025).

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.

6 Concluding remarks

The context of this study is shaped by the unprecedented migration of Venezuelans to Colombia, driven by the economic and political crisis in Venezuela. This migration has presented significant challenges, particularly for migrants who face barriers that result in them occupying jobs of a lower status than those they held in Venezuela. In response, the Colombian government introduced residence permits, which include, among other benefits, access to the formal labor market. However, the evidence presented here suggests that while the Permiso Especial de Permanencia (PEP) facilitates access to the labor market, it does not fully address the issue of occupational downgrading.

This study uses a difference-in-differences (DiD) methodology with inverse probability weighting (IPW) to evaluate the impact of the PEP on Venezuelan migrants' labor market outcomes in Colombia. The DiD approach compares pre- and post-migration labor status, while IPW adjusts for selection bias. The analysis relies on data from the EPM survey, which tracks Venezuelan migrants across four waves, capturing employment status, occupational type, and routinization task intensity (RTI) in both Venezuela and Colombia. This allows for a detailed comparison of migrants' occupational transitions before and after migration.

Findings suggest that PEP significantly improves the likelihood of employment for

Venezuelan migrants in Colombia, particularly for women and younger migrants. The PEP reduces the probability of being out of the labor force, especially among migrants who were previously unemployed in Venezuela. However, while PEP holders experience an increase in formal employment, the study also shows that the work permits have limited impact on mitigating occupational downgrading, as many migrants, particularly those who were employed in white-collar jobs in Venezuela, transition to blue-collar roles in Colombia. The findings suggest that while PEP enhances labor market access, it does not significantly improve the quality of the jobs migrants secure, indicating a mismatch between migrant skills and available job opportunities. This mismatch could be the focus of future research, particularly exploring the role of job vacancies and how they align with the qualifications and skills of migrants.

On the other hand, we find that the PEP has a mixed effect on the routinization of tasks among Venezuelan migrants in Colombia. While there is no overall evidence that the PEP significantly reduces job routinization, disaggregated results reveal notable trends. For male migrants previously employed in white-collar jobs in Venezuela, the PEP is associated with a reduction in routine cognitive tasks, suggesting a shift toward more complex, non-routine roles. However, for younger migrants who were employed in blue-collar jobs in Venezuela, the PEP reduces their engagement in non-routine analytic tasks, highlighting challenges in accessing higher-skilled positions despite formal labor market entry.

We also examine the integration characteristics that may be associated with the PEP and help explain the observed results. Our findings indicate that the PEP is linked to improvements in migrants' access to formal job search channels, increased participation in job training, and enhanced adaptation to Colombian culture. Specifically, migrants with PEP are more likely to receive information about formal job opportunities and engage in job training, which positively impacts their labor market outcomes. However, while these mechanisms are positively correlated with improved employment outcomes, they do not fully eliminate occupational downgrading, suggesting that additional policies aimed at

skill development and better labor market integration are needed to address the challenges migrants face more comprehensively.

Gender-focused policies are essential to address the challenges faced by female migrants, particularly those with prior white-collar experience in Venezuela. These women often encounter significant barriers in maintaining or advancing their occupational status upon migrating to Colombia. To mitigate occupational downgrading, targeted policies should focus on providing women with childcare services and removing barriers to childcare access in terms of availability and affordability for the migrant population (Kwon, 2023; Lancker and Pavolini, 2022; Röder et al., 2017), alongside skill development and mentorship programs. These initiatives can facilitate their transition into higher-skilled, non-routine occupations, thus enhancing their labor market integration.

Finally, while migrants with higher education do not exhibit substantial improvements in labor market outcomes with the PEP, this highlights the need for policies that target human capital misallocation. Investment in education and skills certification for migrants, particularly those with lower educational backgrounds, is crucial. Policies aimed at homologating academic titles, offering job-specific training, and improving access to higher education would better equip migrants with the qualifications necessary to secure skilled and higher-paying employment (Aerne and Trampusch, 2022; Hussain et al., 2018), ultimately enhancing their long-term economic integration in the host country.

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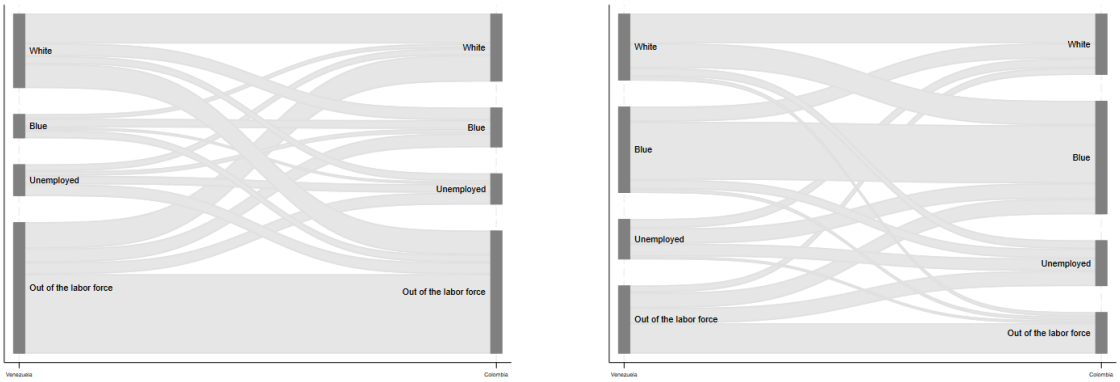
7 Appendix

A Change of occupational status by subsamples

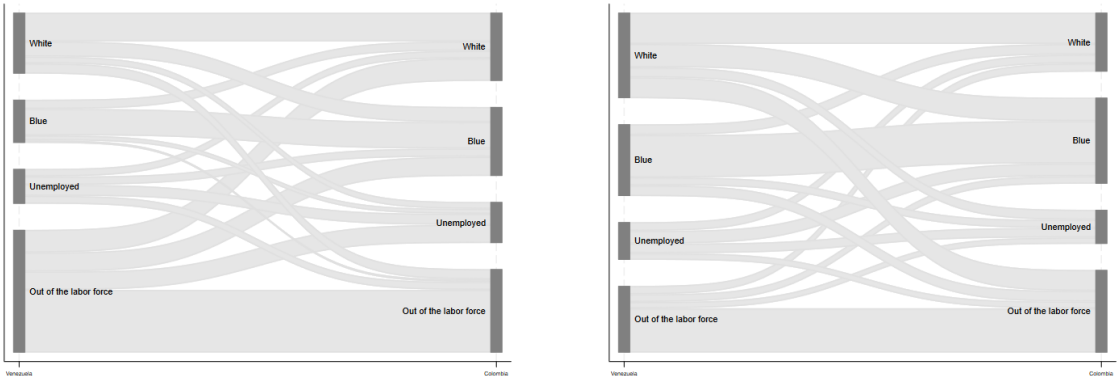
Figure A.1: Change of occupational status from Venezuela to Colombia, by gender



(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.

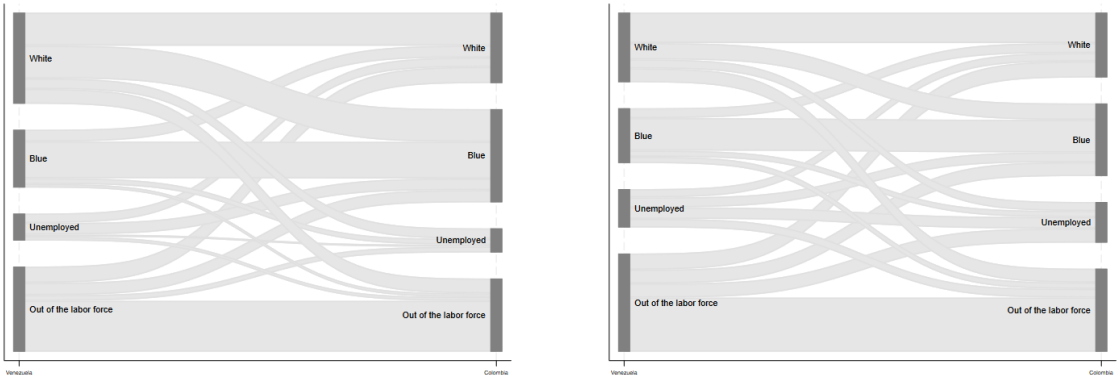
Figure A.2: Change of occupational status from Venezuela to Colombia, by age group



(a) $<$ 34 years old (b) $\geq$ 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.

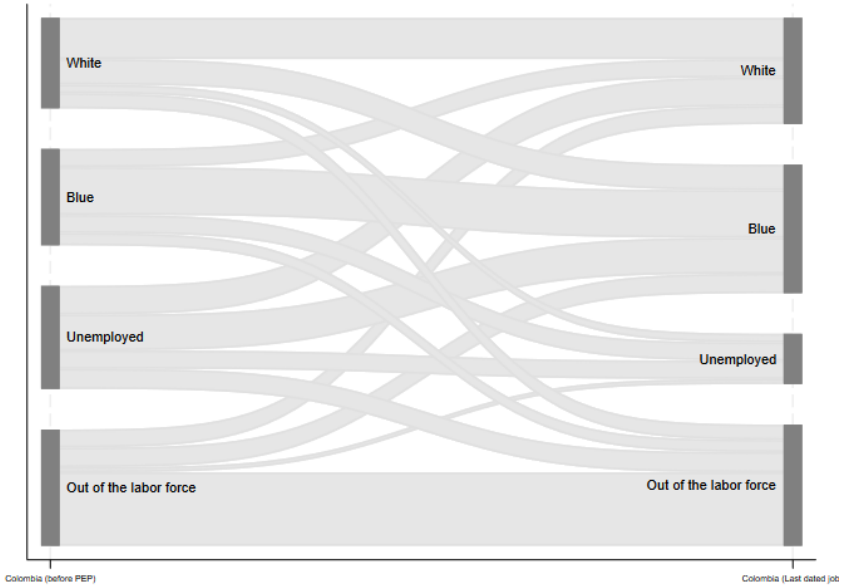
Figure A.3: Change of occupational status from Venezuela to Colombia, by legal status



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

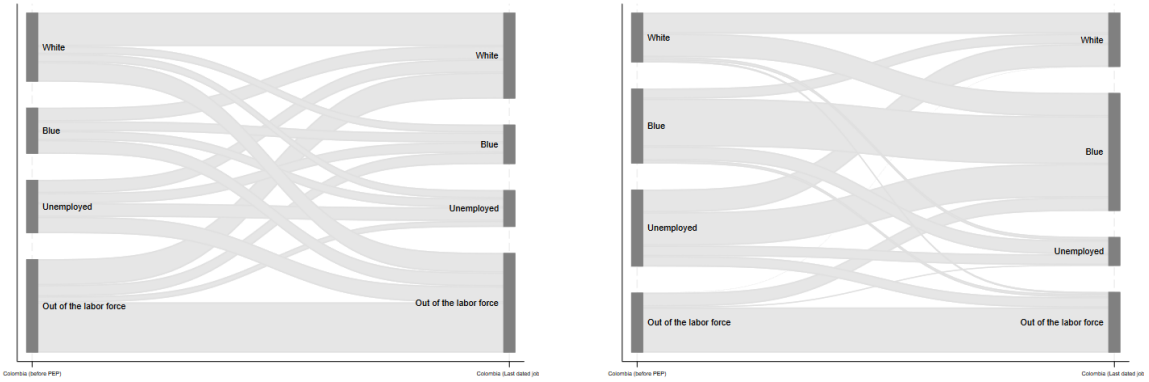
Notes: In each panel, the left axis corresponds to the occupation in which the migrant worked most of the time in Venezuela. The right axis refers to the occupation of the current job in Colombia. For the former variable, we used answers from round 2 which has less missing data. *Source*: Authors' calculations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

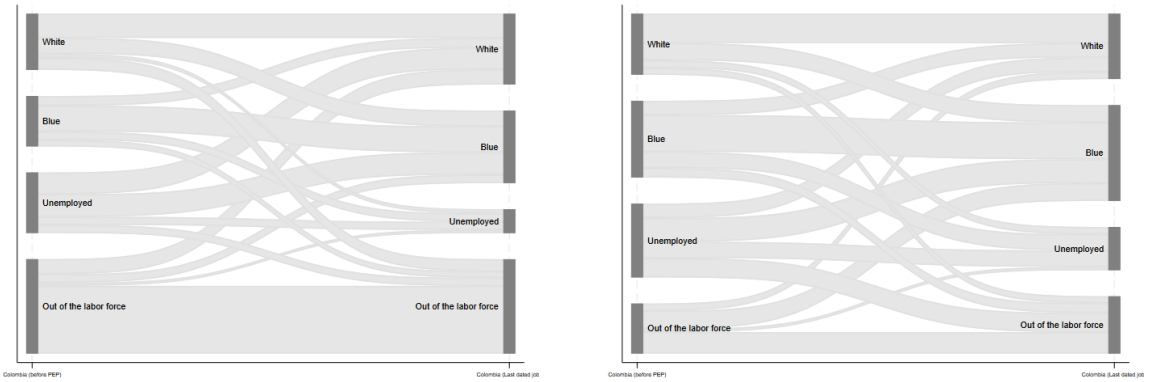
Figure A.5: Change of occupational status from Venezuela to Colombia of migrants with work permits, by gender



(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) $\geq$ 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 PEP 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	(1) Employed	(2) Employed *White-collar*	(3) Formal	(4) Unemployed	(5) Out of the labor force
Panel A. Female					
PEP x T	0.045	-0.007	0.083	0.019	-0.064
	(0.053)	(0.066)	(0.056)	(0.024)	(0.049)
Observations	1,603	1,141	1,118	1,603	1,603
R-squared	0.447	0.395	0.356	0.137	0.349
Panel B. Male					
PEP x T	-0.021	-0.045	-0.106**	0.001	0.021
	(0.035)	(0.045)	(0.041)	(0.030)	(0.018)
Observations	1,210	1,056	1,021	1,210	1,210
R-squared	0.181	0.554	0.351	0.152	0.119
Panel C. Age $<$ 34 years old					
PEP x T	0.031	-0.054	-0.004	0.007	-0.038
	(0.032)	(0.052)	(0.057)	(0.023)	(0.028)
Observations	1,352	1,072	1,011	1,352	1,352
R-squared	0.391	0.530	0.339	0.168	0.273
Panel D. Age $\geq$ 34 years old					
PEP x T	0.006	-0.009	-0.022	0.013	-0.020
	(0.031)	(0.051)	(0.053)	(0.022)	(0.035)
Observations	1,461	1,125	1,128	1,461	1,461
R-squared	0.358	0.477	0.328	0.135	0.315
Panel E. Education $\leq$ Highschool					
PEP x T	0.042	-0.017	-0.026	0.010	-0.052*
	(0.028)	(0.047)	(0.051)	(0.022)	(0.029)
Observations	1,930	1,482	1,460	1,930	1,930
R-squared	0.369	0.521	0.288	0.153	0.280
Panel F. Education $>$ Highschool					
PEP x T	-0.013	-0.040	0.029	0.011	0.001
	(0.036)	(0.057)	(0.075)	(0.025)	(0.032)
Observations	883	715	679	883	883
R-squared	0.382	0.458	0.347	0.121	0.338

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** 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	(1) Employed	(2) Employed *White-collar*	(3) formal	(4) Unemployed	(5) Out of the labor force
Panel A. Female					
PEP x T	0.015	-0.223***	0.008	-0.045	0.030
	(0.104)	(0.076)	(0.130)	(0.031)	(0.090)
Observations	563	389	359	563	563
R-squared	0.464	0.549	0.397	0.170	0.430
Panel B. Male					
PEP x T	0.037	0.040	-0.011	0.014	-0.050***
	(0.033)	(0.045)	(0.057)	(0.031)	(0.009)
Observations	1,507	1,312	1,285	1,507	1,507
R-squared	0.223	0.327	0.231	0.169	0.182
Panel C. Age $<$ 34 years old					
PEP x T	0.082*	0.087	-0.040	-0.068***	-0.014
	(0.043)	(0.070)	(0.066)	(0.024)	(0.035)
Observations	917	779	731	917	917
R-squared	0.316	0.368	0.249	0.156	0.331
Panel D. Age $\geq$ 34 years old					
PEP x T	-0.008	-0.084	0.038	0.055	-0.047
	(0.062)	(0.075)	(0.066)	(0.049)	(0.054)
Observations	1,153	922	913	1,153	1,153
R-squared	0.328	0.330	0.291	0.191	0.270
Panel E. Education $\leq$ Highschool					
PEP x T	0.044	0.010	0.016	0.002	-0.046
	(0.046)	(0.049)	(0.050)	(0.027)	(0.042)
Observations	1,832	1,495	1,452	1,832	1,832
R-squared	0.307	0.293	0.215	0.143	0.275
Panel F. Education $>$ Highschool					
PEP x T	0.019	0.011	-0.070	-0.018	-0.001
	(0.100)	(0.147)	(0.172)	(0.076)	(0.042)
Observations	238	206	192	238	238
R-squared	0.367	0.533	0.471	0.295	0.396

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** 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	(1) Employed	(2) Employed *white-collar*	(3) Formal	(4) Unemployed	(5) Out of the labor force
Panel A. Female					
PEP x T	0.124	0.040	0.142**	0.008	-0.132
	(0.157)	(0.110)	(0.051)	(0.071)	(0.110)
Observations	430	291	264	430	430
R-squared	0.495	0.739	0.418	0.828	0.396
Panel B. Male					
PEP x T	0.112*	-0.008	-0.138	-0.080	-0.032*
	(0.058)	(0.081)	(0.138)	(0.057)	(0.018)
Observations	507	408	387	507	507
R-squared	0.735	0.474	0.516	0.801	0.259
Panel C. Age $<$ 34 years old					
PEP x T	0.174	-0.050	0.036	0.005	-0.178***
	(0.106)	(0.110)	(0.047)	(0.075)	(0.051)
Observations	571	423	371	571	571
R-squared	0.658	0.637	0.516	0.824	0.333
Panel D. Age $\geq$ 34 years old					
PEP x T	0.096	0.028	-0.090	-0.056	-0.040
	(0.101)	(0.076)	(0.194)	(0.050)	(0.086)
Observations	366	276	280	366	366
R-squared	0.618	0.564	0.474	0.815	0.310
Panel E. Education $\leq$ Highschool					
PEP x T	0.214**	0.014	-0.117*	-0.048	-0.166***
	(0.101)	(0.091)	(0.067)	(0.057)	(0.047)
Observations	735	545	501	735	735
R-squared	0.649	0.514	0.467	0.818	0.312
Panel F. Education $>$ Highschool					
PEP x T	0.051	-0.035	0.109	-0.026	-0.025
	(0.145)	(0.138)	(0.176)	(0.083)	(0.100)
Observations	202	154	150	202	202
R-squared	0.630	0.741	0.517	0.848	0.369

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** 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	(1) Employed	(2) Employed *white-collar*	(3) Formal	(4) Unemployed	(5) Out of the labor force
Panel A. Female					
PEP x T	0.036	-0.013	-0.030	0.008	-0.044
	(0.047)	(0.047)	(0.076)	(0.035)	(0.034)
Observations	2,390	1,495	755	2,390	2,390
R-squared	0.431	0.762	0.338	0.108	0.460
Panel B. Male					
PEP x T	0.015	-0.000	-0.003	-0.085*	0.070
	(0.086)	(0.167)	(0.162)	(0.043)	(0.067)
Observations	884	592	299	884	884
R-squared	0.540	0.593	0.508	0.176	0.630
Panel C. Age $<$ 34 years old					
PEP x T	-0.000	0.005	-0.006	-0.025	0.025
	(0.046)	(0.117)	(0.095)	(0.041)	(0.040)
Observations	2,388	1,541	674	2,388	2,388
R-squared	0.442	0.698	0.382	0.115	0.499
Panel D. Age $\geq$ 34 years old					
PEP x T	0.074	0.057	-0.004	-0.012	-0.063
	(0.053)	(0.085)	(0.093)	(0.031)	(0.049)
Observations	886	546	380	886	886
R-squared	0.526	0.736	0.349	0.148	0.547
Panel E. Education $\leq$ Highschool					
PEP x T	0.017	0.026	-0.075	-0.013	-0.004
	(0.041)	(0.081)	(0.085)	(0.032)	(0.033)
Observations	2,850	1,792	867	2,850	2,850
R-squared	0.433	0.684	0.300	0.097	0.478
Panel F. Education $>$ Highschool					
PEP x T	0.058	-0.058	0.180	-0.031	-0.027
	(0.077)	(0.136)	(0.194)	(0.067)	(0.071)
Observations	424	295	187	424	424
R-squared	0.583	0.791	0.512	0.280	0.643

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.

C Impact of PEP on routinization

Table C.1: Impact of PEP on RTI in Colombia

	(1)	(2)	(3)	(4)	(5)	(6)
	RTI	Routine		Non-routine		
Variables		Cognitive	Manual	Analytic	Interactive	Manual
Panel A. Migrants who had a *white-collar* job in Venezuela						
PEP x T	-0.012	-0.015	0.010	0.015	0.001	-0.015
	(0.045)	(0.022)	(0.007)	(0.021)	(0.018)	(0.030)
Observations	2,175	2,175	2,175	1,843	2,175	2,175
R-squared	0.207	0.245	0.121	0.349	0.260	0.403
Panel B. Migrants who had a *blue-collar* job in Venezuela						
PEP x T	0.043	0.012	0.009	-0.002	-0.010	-0.010
	(0.057)	(0.025)	(0.034)	(0.010)	(0.016)	(0.033)
Observations	1,630	1,630	1,630	1,607	1,630	1,630
R-squared	0.301	0.267	0.264	0.215	0.253	0.276

Notes: 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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** 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.

	(1)	(2)	(3)	(4)	(5)	(6)
	RTI	Routine		Non-routine		
Variables		Cognitive	Manual	Analytic	Interactive	Manual
Panel A. Female						
PEP x T	0.031	0.014	0.001	0.021	-0.007	-0.037
	(0.049)	(0.023)	(0.007)	(0.041)	(0.031)	(0.049)
Observations	1,134	1,134	1,134	908	1,134	1,134
R-squared	0.272	0.283	0.130	0.393	0.273	0.523
Panel B. Male						
PEP x T	-0.091	-0.057*	0.012	-0.005	0.008	0.040
	(0.063)	(0.029)	(0.013)	(0.023)	(0.022)	(0.040)
Observations	1,041	1,041	1,041	935	1,041	1,041
R-squared	0.261	0.336	0.162	0.413	0.326	0.412
Panel C. Age $<$ 34 years old						
PEP x T	0.019	-0.016	0.025	0.001	-0.018	0.008
	(0.072)	(0.036)	(0.016)	(0.033)	(0.030)	(0.042)
Observations	1,033	1,033	1,033	857	1,033	1,033
R-squared	0.246	0.277	0.162	0.356	0.262	0.436
Panel D. Age $\geq$ 34 years old						
PEP x T	0.031	-0.009	0.024	0.001	-0.023	0.007
	(0.068)	(0.034)	(0.014)	(0.031)	(0.030)	(0.041)
Observations	1,064	1,064	1,064	878	1,064	1,064
R-squared	0.254	0.279	0.162	0.376	0.276	0.453
Panel E. Education $\leq$ Highschool						
PEP x T	-0.037	-0.022	0.004	0.019	0.005	-0.012
	(0.056)	(0.028)	(0.012)	(0.020)	(0.019)	(0.031)
Observations	1,467	1,467	1,467	1,215	1,467	1,467
R-squared	0.240	0.282	0.149	0.302	0.300	0.400
Panel F. Education $>$ Highschool						
PEP x T	0.012	-0.014	0.021	0.010	-0.009	-0.014
	(0.073)	(0.036)	(0.016)	(0.048)	(0.032)	(0.055)
Observations	708	708	708	628	708	708
R-squared	0.264	0.286	0.173	0.414	0.304	0.475

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** 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.

	(1)	(2)	(3)	(4)	(5)	(6)
	RTI	Routine		Non-routine		
Variables		Cognitive	Manual	Analytic	Interactive	Manual
PEP x T	-0.063	-0.030	-0.002	-0.011	0.008	0.043
	(0.086)	(0.030)	(0.046)	(0.008)	(0.034)	(0.062)
Observations	385	385	385	377	385	385
R-squared	0.476	0.444	0.433	0.430	0.538	0.418
Panel B. Male						
PEP x T	0.067	0.023	0.011	0.004	-0.017	-0.022
	(0.077)	(0.031)	(0.041)	(0.012)	(0.019)	(0.046)
Observations	1,245	1,245	1,245	1,230	1,245	1,245
R-squared	0.294	0.262	0.279	0.226	0.209	0.289
Panel C. Age $<$ 34 years old						
PEP x T	0.153	0.051	0.026	-0.032**	-0.009	-0.042
	(0.093)	(0.040)	(0.039)	(0.013)	(0.024)	(0.055)
Observations	756	756	756	741	756	756
R-squared	0.355	0.290	0.271	0.259	0.317	0.358
Panel D. Age $\geq$ 34 years old						
PEP x T	-0.061	-0.023	-0.008	0.025	-0.015	0.023
	(0.100)	(0.028)	(0.048)	(0.018)	(0.022)	(0.071)
Observations	874	874	874	866	874	874
R-squared	0.359	0.357	0.353	0.284	0.315	0.323
Panel E. Education $\leq$ Highschool						
PEP x T	0.052	0.005	0.021	-0.006	-0.005	-0.015
	(0.060)	(0.022)	(0.032)	(0.009)	(0.015)	(0.035)
Observations	1,430	1,430	1,430	1,412	1,430	1,430
R-squared	0.323	0.296	0.286	0.234	0.276	0.292
Panel F. Education $>$ Highschool						
PEP x T	-0.021	0.052	-0.062	0.007	-0.032	0.034
	(0.219)	(0.076)	(0.121)	(0.043)	(0.056)	(0.122)
Observations	200	200	200	195	200	200
R-squared	0.447	0.439	0.429	0.529	0.467	0.491

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. Cluster-robust wild bootstrap p-values are used in these estimates to adjust for potential clustering effects. *** significant at the 1%, ** significant at the 5%, * significant at the 10%. *Source:* Authors' calculations using EPM.