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### Signaling and Migrant Labor Market Integration: Experimental evidence from Colombia --Manuscript Draft--

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# Signaling and Migrant Labor Market Integration: Experimental evidence from Colombia

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#### Abstract

Labor market signaling plays a crucial role in job matching by reducing information frictions for employers. This paper examines whether signaling is an effective labor market integration policy and how its returns vary based on the accuracy of ex-ante signals. We estimate the heterogeneous returns to signaling by locals and migrants, who differ in the accuracy of their available education and prior experience signals. Our analysis employs data from a skill certification program in Colombia that provides both locals and migrants with a common credible signal within the labor market. Selection into the program was randomized, with 30 percent of spots allocated to migrants. Our estimation strategy leverages this random assignment to estimate the heterogeneous returns to signaling for both locals and migrants. Our findings offer valuable insights for policy improvements aimed at enhancing the labor market integration of migrants by assessing the heterogeneous returns of labor market signaling.

Keywords: Signaling, Skills, Migration, Labor Market Integration, Colombia

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## 1 Introduction

Employers often struggle to assess candidates' skills due to limited observability. To address these information gaps, job seekers rely on signals such as academic and technical degrees, university reputation, completed courses, and grade point averages (Spence, 1973). These signals have been shown to generate significant labor market returns (Abebe et al., 2021; Bassi and Nansamba, 2022; Carranza et al., 2022; Heller and Kessler, 2021; Pallais, 2014; Landaud et al., 2024; MacLeod et al., 2017; Eble and Hu, 2022), particularly for individuals with limited access to well-established credentials (Busso et al., 2023). Foreign migrants often have weaker labor market signals because employers may be unfamiliar with their home countries' educational systems and professional standards. As a result, migrants frequently face difficulties securing employment or are relegated to low-paying jobs that do not match their qualifications (Dustmann et al., 2012; Lebow, 2023).

This paper studies whether labor market signaling improves migrants' integration into the recipient economy. Specifically, we analyze skill certifications as a signaling mechanism and estimate their returns for locals and migrants. Skill certification programs offer a potentially cost-effective policy tool that can equip migrants with recognized credentials, allowing them to credibly signal their qualifications to local employers. Unlike training programs, these certifications do not teach new skills; instead, they assess existing competencies and certify proficiency in specific areas within a short time frame. Previous research has shown that skill certifications significantly enhance labor market outcomes for job seekers (Abebe et al., 2021; Bassi and Nansamba, 2022; Carranza et al., 2022; Heller and Kessler, 2021; Pallais, 2014; Busso et al., 2023).

We rely on a randomized control trial that provides skill certifications to both locals and migrants in Colombia. This program, *Saber Hacer Vale*, is a free skill certification initiative by the Colombian Ministry of Labor. Participants are assessed by qualified evaluators from SENA (Colombian Vocational Training Agency), a widely recognized institution among employers. Each year, SENA certifies over 200,000 individuals and provides training to more than 8 million. Successful candidates receive a publicly recognized certification in a predetermined skill area. In addition to certification, the program provides information on publicly available job-search resources and financial assistance during participation. The program is designed to be completed within one month and assigns 30 percent of the available spots to migrants.

In 2024, *Saber Hacer Vale* will be implemented from late September to late November in the Pacific region of Colombia. Access to the program will be assigned randomly. A total of 2,160 individuals registered, with 855 spots to be allocated by lottery, including 250 reserved for migrants. Candidates assigned to the treatment group will undergo competency evaluations, with successful participants receiving skill certification. Those who fail to obtain the certification will enter a short-term training program and retake the exam. The control group will not receive certification initially. Both groups will be tracked at three, six, nine, and twelve months pots-certification. After one year, control group participants will receive information to apply for the 2025 co-hort, minimizing potential spillover effects.

Our empirical design compares treated and control groups of locals and migrants to estimate the returns to labor market signaling through skill certifications. The sample size allows to detect minimum effects of approximately 0.15 standard deviations for locals and 0.26 for migrants. These effect sizes are close to the lower bound of the impact that a skill certification program typically has on earnings, which ranges from 0.18 to 1.24 standard deviations (Pallais, 2014; Carranza et al., 2022; Abebe et al., 2021; Bassi and Nansamba, 2022). For locals, the lower bound remains well above the minimum detectable effect. For migrants, while the lower bound is slightly below the minimum detectable effect, the expected treatment effect is likely larger, as returns to signaling tend to be greater in populations with less reliable signals (Busso et al., 2023).

Our study contributes to two strands of literature. First, it builds on research examining how credible signals improve job seekers' occupational outcomes. Experimental studies across various contexts have shown that certifications, by providing more reliable information about workers' skills, lead to improved labor market outcomes. For instance, Abebe et al. (2021) evaluated a certification program for young job seekers in Ethiopia,<sup>1</sup> while Bassi and Nansamba (2022) studied how revealing non-cognitive skills to employers during interviews affected hiring in Uganda. Similarly, Carranza et al. (2022) analyzed the impact of randomly distributed assessment results to young job seekers in South Africa, Heller and Kessler (2021) examined how supervisor feedback signals improved the employability of young workers in New York and Pallais (2014) investigated the role of past job performance signals in hiring decisions. Complementary non-experimental evidence further support these findings . For example, Busso et al. (2023) showed that publicly available skill signals in Colombia increase wages, with varying effects by the reputation of job seekers' college.

By analyzing the impact of skill certificates on the labor market outcomes of migrants and natives, our study provides new experimental evidence on the heterogeneous effects of labor market signaling across groups with different access to preexisting signals. Our analysis will also offer policy insights for improving labor market outcomes of vulnerable populations, particularly those with limited access to networks and recognized credentials —such as diplomas, honors degrees, and college reputation— thereby promoting social mobility.

Second, this study contributes to the broader literature on migrant labor market integration. Traditional approaches, such as training program or job search assistance, have been widely implemented to support migrant integration. Various studies have assessed the impacts of programs and subsidies designed to facilitate migrants' employment. For example, Battisti et al. (2019) conducted a field experiment in Italy showing that job search assistance improves employment prospects for migrants. In Sweden, Joona and Nekby (2012) found that intensive coaching programs improve participants' chances of securing long-term employment. In Denmark, Dahlberg et al. (2024) and Foged et al. (2024a) evaluated wage subsidies, training, and placement policies, showing positive impacts on both employment rates and income levels for migrants. In the U.S., evidence suggests that covering citizenship application fees signifi-

<sup>&</sup>lt;sup>1</sup>The certificates were awarded in two stages. First, certificates were delivered based on standardized personnel selection exams. Second, participants received guidance through workshops on how to signal their skills.

cantly aids the legalization process for low-income migrants (Hainmueller et al., 2018). Mentorship programs have also been shown to support immigrant social integration (Philipp Jaschke and Schacht, 2022). In Uganda, Loiacono and Silva-Vargas (2023) evaluated matching programs between refugees and firms, finding improvements in local employment outcomes. Regarding Colombia, Bahar et al. (2021) and Ibáñez et al. (2024) analyzed the effects of a large-scale regularization policy for Venezuelan migrants. Their results suggest that while permits represent a first step toward labor market integration, their impact –especially among low-skilled migrants– was limited.

Our study complements this literature by examining the labor market impacts of providing migrants with certifications that serve as signaling mechanisms. Training and job search assistance programs often involve high implementation costs and require migrants to temporarily exit the workforce, creating financial strain given their limited resources. Moreover, these policies do not directly address information frictions in the job-matching process, which are particularly relevant for migrants. Skill certifications offer cost-effective alternative for migrants who struggle to signal their skills to local employers credibly. By improving the quality of job matches, signals can reduce skill downgrading, lower turnover and increase productivity. Many existing policies overlook the role of information frictions in migrant employment. Alternative forms of certification, such as validation of foreign academic degrees or professional credentials, are often costly and time-consuming. Without skill certification programs, migrants may need to retrain unnecessarily, resulting in productivity losses (Carranza and McKenzie, 2024). Our findings can provide important policy implications for facilitating the integration of migrants into host economies.

## 2 Conceptual Framework

### 2.1 Certifications and the Labor Market Integration of Migrants

Recent literature has demonstrated that skill certification programs serve as valuable labor market signals for local workers in various contexts (Abebe et al., 2021; Bassi and Nansamba, 2022; Carranza et al., 2022; Heller and Kessler, 2021; Pallais, 2014). More reliable information on workers' skills helps improve the mismatch between firms and workers by providing employers with better screening mechanisms. Job seekers might not have reliable certificates because they obtained them from unknown institutions, or they are outdated, having been issued long ago, or they might have never obtained a degree and instead possess knowledge gained through empirical learning. In these cases, skill certificates have proven to be highly useful, as they allow job seekers to transmit credible information to employers.

Furthermore, the employment effects of certificates have proven to be larger among populations with less accurate ex-ante signals (Busso et al., 2023). Highly talented job seekers with weaker signals (such as attending less reputable schools) benefit from being able to transmit more accurate signals to employers. For instance, highly skilled low-income students might not have access to highly reputed schools due to income constraints, despite having the necessary skills to attend them. Accurate signals for this group of students offer strong returns, as they help reduce information frictions

in the job-seeking process.

As a consequence, a key question in this literature, which is highly relevant for policy, is whether credible skill certifications have a significant impact among foreign migrants. Unlike locals, foreign migrants typically have access to weaker skill signals, as these signals were likely acquired in foreign contexts, increasing the information friction for local employers. Therefore, access to more recognized skill certifications could further enhance their job matching capacity, as compared to locals. These effects may have important implications by helping migrants secure jobs that better align with their qualifications, thus reducing skill downgrading among them.

Three potential mechanisms may explain the positive returns of skill certification programs for migrants:

- 1. *Signaling:* The signals available to migrants (such as education level and previous work experience) may be less accurate than those of locals when assessed by local employers. For instance, education diplomas issued within the local economy can be easier for employers to interpret, conveying more reliable information than foreign degrees. Also, while native workers often rely on employer referrals to convey occupational skills gained through work experience, this strategy is likely less accessible to recently arrived migrants with limited experience in the local labor market. Consequently, a common signal for both migrants and locals could hold additional value for migrants, whose outside options may rely heavily on foreign-issued credentials.
- 2. *Reservation wage:* Skill certifications can influence job search behavior by modifying reservation wages. Certifications may serve as a self-assessment mechanism for workers regarding their skill levels in relation to the local economy. As a result, skill certifications could raise the reservation wages of migrants by helping them recognize their qualifications for higher-paying positions. This increased awareness may lead to more selective job search behavior, with migrants opting for jobs that better align with their certified skills and offer improved compensation.
- 3. *Education:* Skill certifications can also provide migrants with valuable information about the returns to education in the host economy. This additional insight may encourage migrants to pursue further studies, potentially enhancing their labor market outcomes in the future.

## 2.2 Research Questions

This paper studies whether access to labor market signaling enhances the labor market integration of populations facing greater information restrictions, such as migrants. Specifically, we aim to address the following related research questions:

- 1. Do skill certifications positively affect labor market outcomes for locals and migrants?
- 2. Can employment policies be improved to promote the labor market integration of migrants by implementing skill certification programs?

### 2.3 Hypothesis

Our primary hypotheses relate to the positive effects of labor market signals among groups with less capacity to transmit accurate information to employers, such as migrants. In line with the theories discussed in Section 2.1, we believe that skill certifications can work as labor market signals allowing employers to better screen candidates. These effects should be heavily concentrated among migrants, who have less signaling capacity.

In particular, we hypothesize that labor market signaling (measured as accessing skill certifications):

- Hypothesis 1: has a positive effect on the likelihood of employment and salary;
- Hypothesis 2: has a differentiated effect between groups with different ex-ante signaling capacity (i.e., locals versus migrants);
- Hypothesis 3: improves the labor migrant allocation of migrants by decreasing skill downgrading;
- Hypothesis 4: allows employers to better screen candidates, increasing labor demand for migrants;
- Hypothesis 5: changes the job-search behavior by allowing workers to accept offers from better paying firms.
- Hypothesis 6: induces migrants into additional education or training.

# 3 Background

### 3.1 Venezuelan Migration to Colombia

The global migrant population has grown significantly in recent years, reaching approximately 281 million in 2020 (United Nations Department of Economic and Social Affairs, 2023b). A substantial portion of this migration occurred within Latin America, increasing from 5.5 million in 2015 to 11.3 million in 2020 (United Nations Department of Economic and Social Affairs, 2023a). More than half of these migrants are Venezue-lans (approximately 6.1 million) fleeing political instability and economic hardship in their home country (R4V, 2023).

Colombia has emerged as the primary destination for these Venezuelan migrants due to its geographical and cultural proximity (Bahar et al., 2021).<sup>2</sup> It is estimated that Colombia currently hosts around three million Venezuelan migrants, representing about six percent of Colombias's current population (R4V, 2023). This means that one-third of all recently established Venezuelan migrants are in Colombia, posing significant challenges to the Colombian labor market and institutions (Delgado-Prieto, 2024; Caruso et al., 2019).

<sup>&</sup>lt;sup>2</sup>Colombia and Venezuela share a border of over 2,000 kilometers and the same native language.

In response to this situation, Colombia implemented a large-scale regularization process that has granted permits to more than half of the Venezuelan migrants (Bahar et al., 2021; Ibáñez et al., 2024).<sup>3</sup> These permits allow migrants to participate legally in the local labor market and access health and education services. Although these permits are a first step toward integration into the local economy, Venezuelan migrants—especially low-skilled ones—continue to face challenges in securing employment, leading to issues of poverty and skill downgrading (Bahar et al., 2021; Lebow, 2023). Consequently, the Colombian government has implemented additional employment aid programs to provide migrants with tools for better integration into the local economy.

#### 3.2 Skill Certification Program

Since 2003, the Colombian government has implemented a free skill certification program for all adults with already acquired empirical work experience.<sup>4</sup> The program aims to provide participants with a streamlined process to validate their skills through publicly recognized certifications. It does not offer training but instead recognizes existing skills in specific competencies. The assessments are conducted by the Colombian Vocational Training Agency (SENA), a public institution dedicated to training and certifying skills.

The certificate is widely known across the Colombian territory due to three key factors. First, more than 200,000 people are certified each year through this program, making the certification a widely used and recognized policy. Second, SENA is a well-regarded institution that offers both certificates and technical training (provided separately). Founded in 1957, SENA has continuously operated with the goal of offering free technical, technological, and complementary programs that support the country's economic, scientific, and social development. It exists in all Colombian municipalities (i.e., around 1,100) and trains approximately 8 million people every year, which represents about 16 percent of the Colombian population. Third, skill certification evaluations are based on occupational standards informed by formal consultations with industry associations. This ensures a degree of formal involvement from employers' representatives. These three factors make the certificates a credible signal of skills for Colombian employers.<sup>5</sup>

All Colombian nationals are eligible to participate in the skills certification program. In addition, participants are required to: 1) have a valid identification; 2) have proven empirical experience in the skill to be certified (of at least six months work experience); 3) register on the website; and 4) accept the legal terms. The program currently offers assessments in 2,405 competencies, covering skills used in areas such

<sup>&</sup>lt;sup>3</sup>As of August 2024, Colombia had issued nearly 1,161,175 permits to Venezuelan migrants under the *Permiso Especial de Permanencia* program (Migración Colombia, 2024).

<sup>&</sup>lt;sup>4</sup>The program is named, in Spanish, "Programa de Evaluación y Certificación de Competencias Laborales", which was regulated by Decree 933 of 2003.

<sup>&</sup>lt;sup>5</sup>Measuring the program's true reputation among employers remains challenging due to limited available data. As a result, in a parallel project, we are collecting data through a correspondence study that specifically measures employers' perceptions by using fake applications that randomly vary the inclusion of the certifications.

as manufacturing, agriculture, retail, and service occupations. It is open to both employed and unemployed individuals who register by selecting a competency for certification.

Candidates are evaluated in two stages, including both a practical and a knowledge test. First, a qualified SENA assessor empirically evaluates the participant's skill level in that competency assessing a series of tasks and providing grades on a pass/fail basis. To receive a certificate, participants must demonstrate empirical knowledge in the evaluated competence, earning a pass grade. Second, participants take a multiplechoice knowledge exam administered virtually, with scores ranging from 0 to 100. Participants are classified depending on their score into one of three levels: basic, intermediate, or advanced.<sup>6</sup> Candidates who approve both tests are immediately awarded the certificate, while those who do not are eligible to enroll in a gap-closure six-hour remedial session designed to help them eventually earn the certificate. Only a small share (less than 10 percent) of participants have historically fail the exam.

#### 3.3 Saber Hacer Vale

Since 2021, in response to the migrant crisis and the National Development Plan 2018-2022, the skills certification program has enabled foreign migrants to participate in the initiative known as *Saber Hacer Vale*.<sup>7</sup> This program, implemented by SENA and the Colombian Ministry of Labor, maintains all the features of the original skills certification program while also providing participants with: 1) information about publicly available resources (such as job-seeking tools and the public job search platform); and 2) financial assistance during their participation.<sup>8</sup>

All beneficiaries of *Saber Hacer Vale* receive food and connectivity subsidies totaling approximately \$82 USD. Additionally, some beneficiaries qualify for further support, including: \$75 USD for those with dependents, a \$30 USD transportation subsidy if the test is conducted in person, and a \$30 USD subsidy for those enrolled in the gapclosure program. Participants can receive up to \$217 USD in total support, which is equivalent to 70 percent of the minimum salary. The cost per participant of *Saber Hacer Vale* is of around \$ 182 USD, constituting the program into a low-cost initiative relative to other migrant labor market integration programs.<sup>9</sup> Notably, beneficiaries receive

<sup>&</sup>lt;sup>6</sup>The type of certificate awarded depends on the grade obtained in the evaluation process: those with scores below 30 fail the exam and do not receive the certificate; those with scores between 30 and 60 receive a certificate for basic; those between 60 and 90 receive a certificate for intermediate; and those above 90 receive a certificate for advanced knowledge. The issued certificate explicitly states the level at which the individual was classified.

<sup>&</sup>lt;sup>7</sup>The National Development Plan 2018-2022 (or *Plan Nacional de Desarrollo 2018-2022: Pacto Por la Equidad,* in Spanish) was a governmental strategy aimed at promoting social inclusion and productivity. *Saber Hacer Vale* was one of the strategies included in this plan.

<sup>&</sup>lt;sup>8</sup>Although beneficiaries of *Saber Hacer Vale* receive additional information about certain publicly available resources, we believe that the program remains a skill certification initiative. A full description of the program's features is provided in Appendix B, where we also explain why the program is considered a certification intervention rather than a bundle of treatments.

<sup>&</sup>lt;sup>9</sup>The average per round costs of *Saber Hacer Vale* are presented in Appendix Table A.1. Its average cost is of around \$182, which is significantly lower than the cost of other similar integration policies for refugees, such as the \$2,762 per refugee in a language training program discussed in Foged et al. (2024b). Despite this, the Colombian Ministry of Labor is currently facing strong budget constraints that hinder

the cash benefits upon program completion, providing participants with strong completion incentives.

*Saber Hacer Vale* targets foreign individuals and Colombians classified as vulnerable. To be eligible for its additional subsidies, participants must demonstrate that they meet at least one of the following vulnerability criteria:

- Household heads or report having people under care;
- Ages between 18 and 28 or over 60;
- Member of an ethnic group or the LGBTIQ+ community;
- Migrant;
- Colombian citizen who returned to the country;<sup>10</sup>
- Low income.<sup>11</sup>

The goal is to promote access for vulnerable populations who may benefit from a public signal to enter the job market. Importantly, at least 30 percent of the available spots are reserved for migrants with regular permit status.

The program is implemented in four stages. First, the Ministry defines a set of competencies to be certified and identifies a geographic location for the program.<sup>12</sup> Second, the number of participants is determined according to the available budget. Third, the call for applications is launched, and candidates fill out an enrollment form available on the Ministry's website. Finally, the documentation is reviewed and verified to determine eligibility for the program.

Before 2024, selection into the program was assigned in a first-come, first-served mechanism. More 12,000 individuals have been certified through *Saber Hacer Vale* during the past four years, including 4,000 migrants. These rounds of the program were implemented nationwide, certifying 38 different competencies. Appendix Table A.2 presents the number of individuals who have been part of the program since 2021. The program's consistent demand suggests that job seekers view *Saber Hacer Vale* as beneficial for their labor market prospects.

the future implementation of *Saber Hacer Vale*. Therefore, in a parallel project, we will implement an intervention that certifies migrants using the Skills Certification Programs (i.e., with fewer economic incentives), which costs around \$ 60 USD per participant, allowing us to conduct a comprehensive costbenefit analysis, explore the program's scalability in greater depth, and generate more policy-relevant insights.

<sup>&</sup>lt;sup>10</sup>Participants must be registered in the public list known as *Registro Único de Retornados*.

<sup>&</sup>lt;sup>11</sup>Colombia classifies its population based on a score used to target social aid programs, known as SISBEN (Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales). The first three categories in the SISBEN score are considered low income and eligible for social aid.

<sup>&</sup>lt;sup>12</sup>The competencies evaluated are typically selected based on labor demand data and the historical success of technical certifications.

## 4 Research design

#### 4.1 Intervention

Our experimental intervention is integrated into the fifth round of *Saber Hacer Vale*, which is currently taking place during 2024-2025.<sup>13</sup> It is targeted to Colombian and foreigners living in the Colombian Pacific region, specifically in the states of Valle del Cauca, Cauca, and Nariño, which are located in the southwest of Colombia. A total of 855 spots are being offered, distributed across the following competencies: 1) Health Services; 2) Food Processing; 3) Tourism; 4) Design and Tailoring; and 5) Handcrafts.<sup>14</sup> Beneficiaries of this round will receive the full benefits of the program, including skills certification, financial aid, and guidance using the job search platform (as described in Appendix B).

*Timeline of the Evaluation:-* Figure 1 summarizes the implementation and evaluation timeline for *Saber Hacer Vale*, which began with a media campaign in May and June 2024. Multiple dissemination channels were put in place, including social media, radio, and television, and on-site agents were hired to facilitate enrollment. Interested individuals could register for the program between June and August 2024. A total of 2,736 individuals registered by completing the online application form. Of these, 2,160 met the program's eligibility criteria by the end of the application period.<sup>15</sup>



**Figure 1:** Timeline of the Intervention (2024-2025)

*Random Assignment:*- In accordance with the Ministry of Labor, and given the excess demand, access to this round of *Saber Hacer Vale* shifted from a first-come, first-served method to a random assignment process. On September 6th, 2024, the 855 available spots were randomly allocated among the 2,160 eligible applicants, creating the treatment group of the evaluation. The randomization was stratified by competencies and

<sup>&</sup>lt;sup>13</sup>If the budget allows, we plan to additionally include the 2025 round of *Saber Hacer Vale* in the evaluation. This second round will follow the same procedures as the 2024 round described herein.

<sup>&</sup>lt;sup>14</sup>Health service competencies were defined as nursing individuals according to protocols for basic daily activities and their degree of autonomy. Food processing competencies involved food manipulation according to technical procedures and regulations. Tourism competencies included food preparation based on production orders and standard recipes. Design and tailoring competencies focused on modifications according to tailoring and dressmaking techniques. Finally, handcrafts competencies were defined as conditioning recovered materials according to technical requirements.

<sup>&</sup>lt;sup>15</sup>Submitted documents were analyzed between August 1st and September 3rd to determine eligibility for the program.

migrant status.<sup>16</sup> This process ensured a sufficient number of beneficiaries within each competency and allocated 30 percent of the spots (i.e., 250) to migrants. Eligible individuals who were not randomly selected formed the control group for the evaluation. Table 1 presents the sample sizes by treatment status, competency, and whether the participant is a migrant or a local.

Competency	Loca	al	Migrant		
	Treatment	Control		Treatment	Control
Handcrafts	44	71		16	14
Health Services	294	459		36	34
Food processing	153	300		132	122
Design and tailoring	42	111		18	23
Tourism	72	130		48	41
Total	605	1071		250	234

Table 1: Sample sizes by Competencies and Treatment Status

*Certifications:*- Individuals randomly selected to the treatment group will first be assessed by a qualified SENA assessor, who will determine if the participant possesses the necessary skill level to perform the competency for which she registered. If approved, the participant will receive a certification issued by SENA along with financial incentives for completing the program. If not approved, the participant will be offered the opportunity to take a gap-closure program. Upon completion of this program, the participant can retake the exam; if successful, the certification will be issued and financial incentives provided.

The skill evaluation performed by SENA is scheduled to take place during October and November 2024. Skill certificates are to be issued starting November 15th, when all the participants are believed to have been fully assessed.

#### 4.2 Data Collection

Participants in both treatment and control groups are intended to be measured across multiple data collections, before and after the intervention. Baseline information of the candidates was originally gathered at the moment of registration. The enrollment form collected demographic, socioeconomic, educational, and employment information about the participants. Furthermore, if the registrants provided their consent on the form, they were administered a survey that serves as a complementary baseline, capturing additional baseline characteristics. Participants were additionally contacted during September 2024 by telephone gathering information about labor market outcomes, mental health, and measures of poverty. We were able to reinterview a total of 1,940 participants, representing 90 percent of the full randomized

<sup>&</sup>lt;sup>16</sup>The costs of the sample of beneficiaries had to additionally comply with the budget given by the Ministry. An additional \$6,000 were needed in order to have the necessary resources to keep the randomized sample, assuming no attrition. To maintain the integrity of the randomization and ensure the target number of beneficiaries, our team decided to absorb the additional cost.

sample – 93 percent of migrants and 90 percent of locals.<sup>17</sup>

Four additional rounds of data gathering are planned to occur at three, six, nine, and 12 months after the program concludes. The first of these data collections is expected to take place during March 2025. Participants will be recontacted by phone asking them to participate in a survey that gathers similar information as the baseline. Namely, the surveys will focus on information about employment, mental health, poverty, and perspectives about *Saber Hacer Vale*.<sup>18</sup>

### 4.3 Outcomes

The main outcomes of the evaluation correspond to labor market measures that quantify the level of integration to the local economy. The surveys include two distinct sections based on whether the participant is currently employed or unemployed.<sup>19</sup> These main outcomes correspond to:

- Extensive (employment status) and intensive (hours worked) measures of employment;
- Salary;
- Skill downgrading.

Employment status and salary will be gathered following regular methods. To compute a measure of *skill downgrading* we examine participants' occupations, as detailed in column (1) of Table 2, and map them to their level of education. The National Colombian Statistical Office (DANE) provides a direct mapping between these occupation categories and a skill-component measure, which is presented in column (2) of Table 2. Using these classifications, along with the participant's education level, we can identify the proportion of individuals who experience skill downgrading based on their education and occupation. For example, individuals with a university degree working as clerical support workers would be considered as experiencing skill downgrading. Using this method, we compute two (though imperfect) measures of skill downgrading—one for overall skill downgrading and one exclusively for those with professional education.<sup>20</sup>

<sup>&</sup>lt;sup>17</sup>Appendix Table A.3 provides sample sizes in the complementary baseline data.

<sup>&</sup>lt;sup>18</sup>Appendix Table A.4 presents details about the information gathered in the baseline and follow-up surveys.

<sup>&</sup>lt;sup>19</sup>The detailed outcomes refer to the current job for those who are employed, and to the last job held for those who are unemployed.

<sup>&</sup>lt;sup>20</sup>Although this measure may not perfectly capture skill downgrading, especially for job-seekers with a technical education, we believe it still provides valuable insights as a baseline result. For the follow-ups, however, we will include a more granular measure by mapping more detailed occupations (i.e., including more granular categories in column (1) of Table 2) that will allow us to better capture skill downgrading for individuals with different levels of education.

Occupations	Skill Level (1)	Primary education or less (2)	Secondary education (3)	Technical education (4)	University or postgraduate (5)
1. Managers and directors	4,3			Match	Match
<ol><li>Professionals, scientists and intellectuals</li></ol>	4				Match
3. Technicians and associate professionals	3			Match	Match
4. Clerical support workers	2		Match	Downgrade	Downgrade
5. Service and sales workers	2		Match	Downgrade	Downgrade
<ol><li>6. Skilled agricultural, forestry and fishery workers</li></ol>	2		Match	Downgrade	Downgrade
7. Craft and related trades workers	2		Match	Downgrade	Downgrade
8. Plant and machine operators, and assemblers	2		Match	Downgrade	Downgrade
9. Elementary occupations	1	Match	Downgrade	Downgrade	Downgrade

### **Table 2:** Definition of Skill Downgrading

*Note*: The classification of occupations is defined by the International Labour Organization (ILO). Skill level is defined as a function of the complexity and range of tasks and duties to be performed in an occupation. According to the ILO, Skill Level 1 involves performing simple, routine physical or manual tasks that typically requires primary education. Skill Level 2 involves tasks such as operating machinery and electronic equipment, driving vehicles, maintenance and repair, handling, ordering and storing information, typically requiring secondary education. Skill Level 3 involves performing complex technical and practical tasks that demand an extensive body of factual, technical, and procedural knowledge in a specialized field. Finally, Skill Level 4 involves tasks that require complex problem-solving, decision-making, and creativity, based on an extensive body of theoretical and factual knowledge in a specialized field, usually requiring a degree that takes three to six years to complete.

In addition, a series of related secondary outcomes will be collected depending on the response rate in every round. If the length of the questionnaire risks to increase attrition rates, then the information gathered will focus on the primary outcomes. These secondary outcomes include measures of additional labor market outcomes, mental health, poverty and perceptions about the program:

a) Labor Market:

- Probability of further educational attainments (after program finished);
- Probability of formal employment;
- Size of employer (only for employed);
- Economic sector of the employer;
- Type of occupation (support staff, administrative, operator, etc.);
- Probability of wanting to have a different job (only for employed);
- Job satisfaction;
- Duration of unemployment (only for unemployed);
- Minimum acceptable salary to change (if employed) or accept (if unemployed) a job (i.e., measures of reservation wage);
- Maximum expected salary;
- Pursue of additional education.
- b) Mental Health:<sup>21</sup>

<sup>&</sup>lt;sup>21</sup>The psychosocial value of employment is particularly significant in the context of foreign migrants, who often flee their home countries under traumatic circumstances and possess limited financial and social resources in their host countries. Employment and a stable source of income have been shown

- Anxiety and nervousness questions (PHQ-9).
- c) Measures of Poverty:
  - Probability of skipping a meal during the day due to lack of economic resources.
- d) Perceptions about the program:
  - Willingness to pay for the skills certification;
  - Willingness to participate in the certification program in the absence of subsidies;
  - Impact of the subsidies on the perception of the certification program.

### 4.4 Non-Response and Attrition

Our design has associated risks of non-response and attrition. Non-response can exist if participants refuse to answer follow-up telephone surveys or if we are unable to track them. To mitigate this risk, we offer a payment of \$7 USD for each completed survey as an incentive for continued participation. Additionally, we provide a monetary incentive of up to \$30 USD for completing all four rounds of data collection. These incentives are significant for the population under study as they correspond to 10 percent of the monthly minimum wage in Colombia.

In addition, treatment assignment can induce non-response in both the treatment and control groups, implying the existence of attrition. Two sources of attrition may arise in the evaluation. First, some individuals may not complete the certification process. If selected participants fail the evaluation, the treatment and control groups will become non-comparable. However, this has historically not been an issue, as participants have strong incentives to finish; subsidies are provided only upon program completion. Additionally, *Saber Hacer Vale* offers the gap-closure program that allows those who fail to retake the evaluation and eventually obtain certification.

Second, not being assigned to the treatment may discourage some individuals from participating in the study. However, the incentives for completing the surveys are offered independently of treatment status. Given their size, we believe these incentives provide strong motivation for participants to engage and complete all four rounds of data collection even if they are not selected into treatment.

Based on the approval rates of *Saber Hacer Vale* in previous years and response rates to follow-ups in similar studies, we expect overall non-response to be around 10-20 percent. While we believe the incentives are sufficient to motivate participants in both

to have positive effects on mental health (Banerjee and Mullainathan, 2008; Mani et al., 2013), boosting hope, aspirations, confidence, and perceptions of self-efficacy (Banerjee et al., 2019; Banerjee and Duflo, 2012), modifying risk-aversion (Hussam et al., 2022), increasing optimism, trust, and an individual's locus of control (Cobb-Clark et al., 2022), reducing the incidence of depression, and even improving cognitive function (Hussam et al., 2022; Semkovska et al., 2019). Furthermore, we believe these effects are particularly relevant in the Colombian context, as depression rates are high (above 20 percent) among Venezuelan migrants (Ibáñez et al., 2024).

groups, there may still be additional issues leading to considerable non-response that might lead to differential attrition between treatment and control groups. To minimize this risk, we will implement a systematic monitoring system. For each data collection phase, we will daily track the data collection process to assess whether attrition occurs and if it relates to participants' observable characteristics. If it does, we will offer additional incentives and enhance our efforts to locate missing individuals.

If attrition rates between the experimental groups remain constant—both among Colombians and migrants—we can disregard this issue, as our estimates will still be unbiased. However, if we encounter attrition issues by the end of the each data collection, we will follow Blattman et al. (2020) and randomly sample a group of the unfound individuals and heavily invest in tracking them. Given that this is a random sample of difficult-to-find individuals we can give them a bigger weight to recover a consistent intend-to-treat estimate. This approach will be coupled with the approaches outlined by Lee (2009) and Angrist et al. (2006) to estimate bounds on the treatment effects in the presence of differential attrition.

## 5 Empirical strategy

The random allocation of the program ensures that, in the presence of no differential attrition, the treatment and control groups are comparable within the migrant and local groups. A simple regression comparing individuals in treated and control groups is enough to estimate the unbiased treatment effects of the program. Two important margins, however, have to be considered in our empirical approach. First, the treatment effects of *Saber Hacer Vale* might be dynamic and drastically vary depending on the time elapsed since the intervention. Second, our strategy is internally valid within the migrant and local groups but the comparability of the treatment effects between these two groups is challenging. Therefore, we suggest an approach that estimates static and dynamic effects separately for migrants and locals.

We plan on estimating a time-invariant specification that pools the effect into one coefficient. To do so, we will estimate the treatment effects separately by locals and migrants. Formally, these specifications take the form:

$$y_{ijt} = \alpha_0 + \alpha_1 D_i + \mu_j + \mu_t + \varepsilon_{ijt}, \quad \text{for } M_i \in \{0, 1\},$$
(1)

where  $y_{ijt}$  represents an outcome for individual *i*, enrolled in the certification area *j*, at a time *t*,  $D_i$  is a binary variable that equals one if the individual is a beneficiary of the program and zero otherwise,  $M_i$  is a binary indicator that equals one for migrants and zero otherwise, and  $\mu_j$  and  $\mu_t$  corresponds to competency and survey-wave fixed effects, respectively. The error term,  $\varepsilon_{ijt}$ , is clustered at the individual level since we are pooling multiple rounds.

In addition, we plan to estimate a time-variant specification that estimates the dynamic effects of the program. This dynamic specification allow us to capture short-, medium-, and long-term effects of the certification program. Formally, this specification takes the form:

$$y_{ijt} = \beta_0 + \beta_1 D_i + \sum_{t>T_0}^T \beta_{2t} (D_i \times T_t) + \mu_j + \mu_t + \varepsilon_{ijt}, \text{ for } M_i \in \{0, 1\},$$
(2)

where all the terms are the same as in Equation (1). However, the treatment effects are allowed to vary in time by interacting the treatment dummies with survey-waves fixed effects,  $T_t$ , which take the value of one if  $t = t_1$ , where  $t_1 \in \{3, 6, 9, 12\}$  corresponds to the number of months before and after the intervention, and 0 otherwise, and  $T_0$  is a dummy indicating baseline values. The coefficient  $\beta_{2t}$  tests if the effects differ during each survey-wave, relative to baseline measures.

*Comparability between treatment effects by migrants and locals:-* Unfortunately, our identification strategy does not allow us to accurately compare the magnitudes of the treatment effects between migrants and locals. These two samples are inherently different, so differential treatment effects may arise if the effect varies based on pre-treatment characteristics (commonly referred to in the literature as moderators), unobservable characteristics, or if the effect is genuinely heterogeneous between locals and migrants. Our strategy does not enable us to determine which of these three factors is the source of any potential heterogeneity.

Nonetheless, our strategy is internally valid and will provide consistent and unbiased estimates of the certification for locals and migrants, separately. Even though we have strong limitations, we will additionally test the null if the treatment effect is equal between both groups. We believe this is a very policy-relevant test, despite not being able to determine the true source of the potential heterogeneity.

#### 5.1 Internal validity

Random assignment ensures the internal validity of the experiment, as treatment status is exogenous and uncorrelated with both observed and unobserved participant characteristics. We use baseline data to verify this assumption. Table 3 presents descriptive statistics separately for local and migrant participants in the treatment and control groups.<sup>22</sup> Columns (3) and (6) report p-values for the null hypothesis that characteristics are equal between treatment and control groups, while columns (7) to (9) compare locals and migrants.<sup>23</sup>

Our study sample is predominantly female (89 percent among locals and 85 percent among migrants), with an average age of around 42 for locals and 36 for migrants. Migrants make up 22.4 percent of the sample.<sup>24</sup> Additionally, as expected, a significant proportion of the local sample consists of household heads (54 percent), victims

<sup>&</sup>lt;sup>22</sup>Sample sizes do not match those in Table 1 because in Table 3 we restrict the sample to those individuals who were re-interviewed in the complementary baseline. We present a version of Table 3 using all the baseline sample in Appendix Table A.5.

<sup>&</sup>lt;sup>23</sup>These p-values are estimated by regressing the outcome on the treatment or migrant indicator, including competency-level fixed effects, and using robust standard errors. The analysis is conducted separately for locals and migrants.

<sup>&</sup>lt;sup>24</sup>Only two migrants in our sample are not from Venezuela; they are from Panama and Ecuador.

(48 percent), and ethnic minorities (35 percent).

Three key findings emerge at this baseline stage of the project. First, our analysis confirms successful randomization, yielding a balanced sample across treatment and control groups for both locals and migrants. We only observe three p-values below 5 percent, which is expected given our significance level.

Second, columns (7) to (9) compare migrants and locals across multiple dimensions, revealing baseline differences between the two groups. As explained previously, while this does not affect the experiment's internal validity, it unfortunately limits our ability to compare treatment effect magnitudes across subgroups.<sup>25</sup>

Third, we find baseline evidence of skill downgrading using two metrics. First, migrants tend to be more educated—19 percent have tertiary education compared to 8 percent of locals—yet their salaries (whether current salary for employed of last salary for unemployed) are not significantly higher. Second, our direct measures of skill downgrading show that among migrants with professional education, 12 percent work in occupations requiring fewer skills, compared to 3 percent of locals. This pattern emerges across employed and unemployed individuals. However, this mismatch is not as evident for overall skill downgrading (i.e., including those with technical education), where differences between migrants and locals are not as striking. We attribute this to the limited occupational detail collected at baseline. To address this, we will incorporate a more granular measure of occupations in follow-up surveys, as discussed in section 4.3.

#### 5.2 Statistical Power

Our empirical design allow us to estimate a minimum detectable effect of 0.14 standard deviations for the group of locals and of 0.26 for the group of migrants.<sup>26</sup> Given that we expect 10 to 20 percent attrition rate, then the minimum detectable effects will increase to 0.16 standard deviations for locals and to 0.29 standard deviations for immigrants.<sup>27</sup> Using the pooled sample between two groups implies a minimum detectable effect of 0.13 standard deviations.

These minimum detectable effects are reassuring because they are smaller than those previously found in other related studies. Appendix Table A.7 presents a summary of the treatment effects detected in four related randomized control trials using labor income as outcome.<sup>28</sup> We express the effects in these studies in percentage terms with respect to the mean of the controls. We take a conservative approach and use the study with the smallest magnitude in the treatment effects as benchmark. This

<sup>&</sup>lt;sup>25</sup>If treatment effects are homogeneous across both observable and unobservable characteristics, we could directly compare effect magnitudes. However, given baseline differences in moderators, we cannot determine whether differences in treatment effects stem from migrant versus local status or from treatment heterogeneity across moderators that differ between groups.

<sup>&</sup>lt;sup>26</sup>We assume a statistical power of 80 percent and a significance value of 5 percent.

<sup>&</sup>lt;sup>27</sup>We present the minimum detectable effects, varying the degree of attrition, in Appendix Table A.6. These effects do not vary significantly when analyzing different attrition scenarios.

<sup>&</sup>lt;sup>28</sup>We include the effects found in Bassi and Nansamba (2022), Carranza et al. (2022), Pallais (2014) and Abebe et al. (2021).

corresponds to Bassi and Nansamba (2022), who conducted an assessment of a noncognitive skills signal on 676 job applicants in Uganda. In this study the treatment effects corresponds to a 7.9 percent salary increase with respect to the control mean. Using data specific for Venezuelan migrants in Colombia, we find that a 7.9 percent in income corresponds to a 0.18 standard deviations increase in income, which is close to the lowest minimum detectable effect using our sample sizes.<sup>29</sup>

### 5.3 Multiple Hypothesis Testing

Our study may involve multiple outcomes, which could lead to erroneous inferences due to the potential for over-rejecting multiple null hypotheses by chance. To address this issue, we plan to adopt a multiple hypothesis correction method based on the false discovery rate approach. Our p-values will be adjusted following the methodology outlined by Anderson (2008) to account for multiple inferences. Additionally, we will report *q*-values that control for the proportion of incorrectly rejected null hypotheses across outcomes. Given that we plan to evaluate multiple rounds of outcomes, we will also adjust our tests to account for these additional outcomes.

#### 5.4 Mechanisms

Based on the discussion in Section 2.1, we specify direct tests to understand the underlying mechanisms behind the potentially significant treatment effects. Skill certifications could impact labor supply or labor demand, and empirical tests for each of these will be reflected in the timing of the treatment effects. If labor supply is affected, we would expect that certifications induce individuals to postpone their entry into the labor market, either due to the *reservation wage* effect or the *education* effect. Conversely, if labor demand is affected, we would anticipate observing shorter-term effects driven by the *signaling* effect, which enhances employers' screening capacities. All of these mechanisms lead to improved labor market outcomes and are empirically testable within our data.

The *reservation wage* mechanism can be directly examined by analyzing the job search behavior of individuals in the study. In our follow-up rounds, we will collect information about salary expectations, the number of job offers, and the time to the first offer. These data will enable us to quantify any changes in job search behavior induced by the certifications. Specifically, salary expectations serve as a proxy for the reservation wage. Therefore, we plan to estimate Equation 1 and compute the treatment effect using salary expectations as the outcome. A significant point estimate will indicate that the treatment alters individuals' reservation wages, potentially leading to a shift in their job search strategies. Coupled with a differentiated job starting time and higher salaries in the longer term, these results could suggest that certifications influence how individuals search for jobs, ultimately leading to enhanced labor market outcomes.

<sup>&</sup>lt;sup>29</sup>We employ the Pulse of Migration Survey, administered by the Colombian census (i.e., *Departamento Administrativo Nacional de Estadistica*), and focus on migrants over 18 to 60 years of age from Venezuela who entered the country in the last five years and worked in the last month. The mean labor income among this population was COP 866,854 and the standard deviation was COP 381,280. This implies that a 7.9 percent income increase translates into a 0.18 standard deviations.

The *education* mechanism can also be directly tested by observing whether skill certifications lead to additional training or the pursuit of educational degrees. We plan to use Equation 1 to estimate the effect of certification on pursuing further training. While this behavior could postpone employment, it may lead to better job market prospects also in the longer term. The education mechanism can also be directly tested by observing if skill certifications lead to additional training or to pursue educational degrees. We plan to use Equation 1 to estimate the effect of the certification on pursuing additional training. This behavior could postpone employment but lead to better job market prospects in the future.

Finally, if certifications effectively work as labor market signals, they will influence labor demand by improving employers' screening mechanisms. This *signaling* mechanism can also be empirically tested in our data by observing sizable treatment effects in the short term —as opposed to effects that operate via changes in the reservation wage or human capital accumulation. Positive labor market short-term effects would suggest that the signal effectively conveys information to employers without altering job search strategies or inducing additional training. Furthermore, if the effect is significantly larger for migrants, this would strongly support our main hypothesis, indicating that workers with weaker signals benefit most when they can convincingly demonstrate their skills.

Variable	Locals		Migrants			Total			
	Treatment (1)	Control (2)	p-value (3)	Treatment (4)	Control (5)	p-value (6)	Locals (7)	Migrants (8)	p-value (9)
Panel A: General characteristics									
Demographics									
Age	42.74	41.90	0.34	36.14	36.16	0.99	42.20	36.15	0.00
Male	0.10	0.12	0.48	0.17	0.12	0.19	0.11	0.15	0.37
Have people under your care (young or elderly)	0.54	0.55	0.28	0.47	0.44	0.68	0.54	0.46	0.45
No children under 5 years †	0.69	0.69	0.86	0.53	0.57	0.38	0.69	0.55	0.00
One child under 5 years †	0.26	0.25	0.65	0.37	0.37	0.94	0.26	0.37	0.00
More than one child under 5 years †	0.05	0.06	0.59	0.10	0.06	0.13	0.05	0.08	0.17
Head of household	0.54	0.54	0.98	0.64	0.68	0.34	0.54	0.65	0.00
Identifies as LGBTIQ	0.04	0.04	0.99	0.07	0.08	0.72	0.04	0.07	0.01
Disability (mental or physical)	0.06	0.05	0.86	0.03	0.06	0.05	0.06	0.04	0.32
Victim of conflict	0.46	0.49	0.30	0.02	0.03	0.50	0.48	0.03	0.00
Ethnic minority	0.33	0.37	0.16	0.03	0.02	0.65	0.35	0.03	0.00
Eligible for government assistance	0.62	0.61	0.59	0.56	0.58	0.64	0.61	0.57	0.06
Receives government or NGO assistance	0.14	0.14	0.70	0.01	0.01	0.90	0.14	0.01	0.00
Receives government of rudo assistance	0.14	0.14	0.70	0.01	0.01	0.90	0.11	0.01	0.00
Education									
Primary education or less	0.20	0.17	0.28	0.07	0.06	0.49	0.18	0.06	0.00
Secondary or technical education	0.72	0.74	0.34	0.75	0.75	0.99	0.73	0.75	0.64
University or postgraduate education	0.09	0.08	0.99	0.18	0.19	0.64	0.08	0.19	0.00
Labor									
Employed t	0.51	0.48	0.08	0.69	0.71	0.72	0.49	0.70	0.00
Pooled monthly salary (USD)* +	98.31	97 13	0.86	94 79	95.89	0.89	97.56	95.33	0.69
Pooled overall skill downgrading* +	0.14	0.16	0.32	0.21	0.24	0.45	0.15	0.22	0.00
Pooled skill downgrading among professionals* +	0.03	0.03	0.89	0.11	0.13	0.52	0.03	0.12	0.00
Loss than 1 year of work experience	0.05	0.03	0.07	0.11	0.15	0.32	0.05	0.12	0.00
1.2 waars of work experience	0.15	0.15	0.27	0.10	0.08	0.41	0.14	0.09	0.04
2 E waars of work experience	0.19	0.19	0.85	0.20	0.28	0.08	0.19	0.27	0.03
5-5 years of work experience	0.20	0.20	0.76	0.20	0.51	0.21	0.20	0.29	0.00
6-10 years of work experience	0.15	0.17	0.37	0.18	0.13	0.17	0.17	0.16	0.57
More than 10 years of work experience	0.31	0.31	0.58	0.19	0.19	0.98	0.31	0.19	0.00
N (Sample Size)	540	948		236	216		1488	452	
Panel B: Employed	0		a a <b>-</b>	0 <b>2 55</b>	00.45	0.00	04.05		0.44
Current monthly salary (USD) †	95.76	97.52	0.95	93.55	93.17	0.99	96.85	93.36	0.66
Overall skill downgrading †	0.20	0.23	0.42	0.26	0.26	0.89	0.22	0.26	0.16
Skill downgrading among professionals †	0.05	0.05	0.70	0.15	0.14	0.72	0.05	0.15	0.00
Have written employment contract	0.13	0.13	0.85	0.09	0.08	0.83	0.13	0.09	0.09
Contributes to pension fund †	0.21	0.21	0.97	0.15	0.07	0.02	0.21	0.11	0.00
Full-time job	0.51	0.44	0.14	0.43	0.49	0.43	0.47	0.45	0.58
Part-time job	0.31	0.32	0.80	0.30	0.30	0.68	0.32	0.30	0.47
Quarter-time job	0.18	0.23	0.14	0.27	0.21	0.61	0.21	0.25	0.14
N (Sample Size)	278	456		163	153		734	316	
Panel C: Unemployed									
Last job monthly salary (USD) †	101.61	96.70	0.48	98.33	102.85	0.88	98.42	100.63	0.85
Overall skill downgrading (last job) †	0.07	0.09	0.21	0.10	0.17	0.16	0.09	0.13	0.09
Skill downgrading among professionals (last job) +	0.01	0.01	0.98	0.03	0.13	0.03	0.01	0.07	0.01
Never been employed	0.04	0.01	0.04	0.03	0.02	0.67	0.02	0.02	0.54
Actively seeking job (last 4 weeks) †	0.47	0.48	0.92	0.63	0.54	0.32	0.48	0.59	0.25
Job search intensity: less than 5 hrs/day	0.64	0.59	0.44	0.63	0.53	0.52	0.61	0.58	0.57
Job search intensity: 5-10 hrs/dav	0.29	0.32	0.56	0.29	0.31	0.70	0.31	0.30	0.96
Job search intensity: Over 10 hrs/day	0.07	0.09	0.68	0.08	0.16	0.14	0.08	0.12	0.31
N (Sample Size)	262	492		73	63		754	136	

### Table 3: Balance within Locals and Migrants

*Note:* Panel A describes the sample of all eligible persons, while panels B and C only include employed and unemployed persons, respectively. Columns (1), (2), (4) and (5) present the means of the variables by treatment condition within each group. Columns (7) and (8) present the means of the variables for locals and migrants. The *p-values* in columns (3) and (6) are estimated by regressing the outcome on the treatment indicator, including competency-level fixed effects, using robust standard errors and were conducted separately for locals and migrants. *P-values* in column (9) are estimated by regressing the outcome on the migrant variable, including competency-level fixed effects and using robust standard errors. \* Pooled variables combine current job information for employed individuals with last job information for unemployed individuals into a single variable. Overall skill downgrading measures are calculated for technicians and professionals. †These variables were collected in the complementary baseline conducted three months after enrollment in the program.

# 6 Ethics and IRB Approval

Due to the randomization of program participation in the experiment, ethical concerns arise because some eligible candidates will not receive treatment due to the Ministry's budget constraints. Additionally, the study involves collecting personal information and tracking individuals over time. Consequently, the study was submitted to the Social Sciences Ethics Committee of Universidad del Rosario for approval. On April 18, 2024, our application was approved and deemed to pose minimal risk by the IRB, with case number DVO005 891 - CS520.

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# **Appendices:**

# A Additional Figures and Tables

Appendix Table A.1: Implementation Costs of Saber Hacer Vale
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Year	Full Cost USD	Beneficiaries	Cost per-person USD
2021	373,253	3,050	122.378
2022	402,959	3,150	127.9235
2023	357,129	2,500	142.8518
2024	284,923	855	333.243
Avg. cost per person			182

Appendix Table A.2: Yearly Participation into Saber Hacer Vale

Call	Actual Beneficiaries	Colombian	Migrants	% of Migrants
2021	2,947	1,989	958	32.51
2022-1	1,636	1,114	522	31.91
2022-2	4,429	2,943	1,486	33.55
2023	2,623	1,581	1,042	39.73
2024	855	605	250	29.24
Total	12,490	8,232	4,258	

Appendix Table A.3: Sample sizes by Competencies and Treatment Status in Complementary Baseline

Competency	Loc	al	Migr	Migrant		
competency	Treatment	Control	Treatment	Control		
Handcrafts	37	64	16	13		
Health Services	266	404	35	33		
Food processing	133	269	121	110		
Design and tailoring	38	97	17	21		
Tourism	66	114	47	39		
Total	540	948	236	216		

Section	Enrollment Form (Baseline)	Complementary Baseline	Follow-ups
Identification and contact information	Х	Reduced	Reduced
Education	Х		
Work experience and employability difficulties	Х		
Employed (salary, formality, job intensity, job satisfaction, size of firm, type of job, economic sector of the employer)	Reduced	х	Х
Unemployed (job salary, type of job and economic sector of previous job, job search intensity, job seeking behaviour, unemployment duration)	Reduced	Х	х
Salary expectations (reservation wage and maximum expected salary)		Х	Х
Mental health (GAD-7)		Х	Х
Food security		Х	Х
Further training/education outside the program			Х
Participants' perspectives on the program (willingness to pay for the skills certification, willingness to participate in the absence of the subsidies)			х
Authorization for future contact	Х	Х	Х

# Appendix Table A.4: Content by survey

#### Appendix Table A.5: Balance within Locals and Migrants

Variable	Locals		Migrants			Total			
	Treatment (1)	Control (2)	p-value (3)	Treatment (4)	Control (5)	p-value (6)	Locals (7)	Migrants (8)	p-value (9)
Panel A: General characteristics									
Demographics									
Age	42.67	42.35	0.82	35.96	36.07	0.95	42.47	36.02	0.00
Male	0.12	0.12	0.91	0.18	0.14	0.24	0.12	0.16	0.36
Have people under your care (young or elderly)	0.53	0.55	0.11	0.46	0.45	0.81	0.54	0.46	0.44
No children under 5 years †	0.69	0.69	0.86	0.53	0.57	0.38	0.69	0.55	0.00
One child under 5 years †	0.23	0.22	0.59	0.35	0.34	0.80	0.23	0.34	0.00
More than one child under 5 years †	0.04	0.05	0.62	0.09	0.06	0.12	0.05	0.07	0.11
Head of household	0.54	0.53	0.93	0.63	0.68	0.21	0.54	0.65	0.00
Identifies as LGBTIQ	0.04	0.04	0.83	0.06	0.08	0.50	0.04	0.07	0.01
Disability (mental or physical)	0.06	0.06	1.00	0.03	0.06	0.10	0.06	0.04	0.23
Victim of conflict	0.45	0.48	0.28	0.02	0.03	0.52	0.47	0.03	0.00
Ethnic minority	0.33	0.37	0.10	0.03	0.03	0.89	0.35	0.03	0.00
Eligible for government assistance	0.62	0.61	0.71	0.55	0.57	0.64	0.62	0.56	0.01
Receives government or NGO assistance	0.14	0.14	0.78	0.01	0.01	0.91	0.14	0.01	0.00
Education									
Primary education or less	0.19	0.19	0.65	0.08	0.05	0.21	0.19	0.07	0.00
Secondary or technical education	0.70	0.72	0.42	0.74	0.76	0.68	0.72	0.75	0.26
University or postgraduate education	0.08	0.08	0.70	0.18	0.19	0.72	0.08	0.18	0.00
Labor									
Employed	0.32	0.33	0.93	0.54	0.50	0.40	0.33	0.52	0.00
Pooled monthly salary (USD)* †	98.31	97.13	0.86	94.79	95.89	0.89	97.56	95.33	0.69
Pooled overall skill downgrading* †	0.14	0.16	0.32	0.21	0.24	0.45	0.15	0.22	0.00
Pooled skill downgrading among professionals* †	0.03	0.03	0.89	0.11	0.13	0.52	0.03	0.12	0.00
Less than 1 year of work experience	0.15	0.13	0.35	0.10	0.09	0.85	0.13	0.10	0.10
1-2 years of work experience	0.19	0.18	0.82	0.26	0.28	0.62	0.18	0.27	0.01
3-5 years of work experience	0.20	0.10	0.51	0.27	0.29	0.49	0.10	0.28	0.01
6-10 years of work experience	0.16	0.17	0.47	0.18	0.14	0.31	0.16	0.16	0.59
More than 10 years of work experience	0.31	0.33	0.38	0.20	0.19	0.79	0.32	0.19	0.00
N (Sample Size)	605	1071		250	234		1676	484	
Panel B: Employed									
Current monthly salary (USD) †	95.76	97.52	0.95	93.55	93.17	0.99	96.85	93.36	0.66
Overall skill downgrading †	0.20	0.23	0.42	0.26	0.26	0.89	0.22	0.26	0.16
Skill downgrading among professionals †	0.05	0.05	0.70	0.15	0.14	0.72	0.05	0.15	0.00
Have written employment contract	0.14	0.13	0.97	0.08	0.08	0.91	0.13	0.08	0.05
Contributes to pension fund †	0.21	0.21	0.97	0.15	0.07	0.02	0.21	0.11	0.00
Full-time job	0.51	0.45	0.18	0.44	0.50	0.39	0.47	0.47	0.62
Part-time job	0.30	0.32	0.66	0.30	0.29	0.61	0.31	0.29	0.44
Quarter-time job	0.19	0.23	0.27	0.27	0.21	0.62	0.21	0.24	0.16
N (Sample Size)	196	356		135	118		552	253	
Panel C: Unemployed	104	04 = 2	0.42	00.77	105 05	0.00	00 ··•	400	0.07
Last job monthly salary (USD) +	101.61	96.70	0.48	98.33	102.85	0.88	98.42	100.63	0.85
Overall skill downgrading (last job) †	0.07	0.09	0.21	0.10	0.17	0.16	0.09	0.13	0.09
Skill downgrading among professionals (last job) †	0.01	0.01	0.98	0.03	0.13	0.03	0.01	0.07	0.01
Never been employed	0.03	0.01	0.04	0.03	0.02	0.68	0.02	0.02	0.48
Actively seeking job (last 4 weeks) †	0.47	0.48	0.92	0.63	0.54	0.32	0.48	0.59	0.25
Job search intensity: less than 5 hrs/day	0.60	0.58	0.75	0.67	0.49	0.20	0.59	0.57	0.74
Job search intensity: 5-10 hrs/day	0.31	0.33	0.76	0.26	0.37	0.75	0.32	0.32	0.97
Job search intensity: Over 10 hrs/day	0.09	0.09	0.95	0.07	0.14	0.13	0.09	0.11	0.62
N (Sample Size)	409	715		115	116		1124	231	

*Note*: This table uses the sample of 2160 people who responded to the enrollment form, unlike Table 3, *Employed* variable was taken from this survey instead of the complementary baseline. Panel A describes the sample of all eligible persons, while panels B and C only include employed and unemployed persons, respectively. Columns (1), (2), (4) and (5) present the means of the variables by treatment condition within each group. Columns (7) and (8) present the means of the variables for locals and migrants. The *p-values* in columns (3) and (6) are estimated by regressing the outcome on the treatment indicator, including competency-level fixed effects, using robust standard errors and were conducted separately for locals and migrants. *P-values* in column (9) are estimated by regressing the outcome on the migrant variable, including competency-level fixed effects and using robust standard errors. \* Pooled variables combine current job information for employed individuals into a single variable. Overall skill downgrading measures are calculated for technicians and professionals. †These variables were collected in the complementary baseline conducted three months after enrollment in the program.

Attrit	ion rates	All sample	Locals	Migrants
Locals	Migrants			
10%	10%	0.13	0.15	0.27
15%	15%	0.13	0.15	0.28
20%	20%	0.14	0.16	0.29
20%	15%	0.14	0.16	0.28
15%	20%	0.13	0.15	0.29

#### **Appendix Table A.6:** Minimum Detectable Effects by attrition rate

*Note*: The minimum detectable effects represent standard deviations from the distribution of the control group.

Paper	Effects (% control mean)	Effects (standard deviations)
Pallais (2014)	54.9% <sup>†</sup> 96% <sup>‡</sup>	1.24 2.18
Carranza et al. (2022)	33.7%	0.77
Abebe et al. (2020)	24.6%	0.56
Bassi and Nansamba (2022)	11.2% <sup>†</sup> 7.9% <sup>††</sup>	0.25 0.18

#### Appendix Table A.7: Effects Documented in Previous Related literature

Note: effects were converted in terms of standard deviations using as control mean COP 866,854 and as a standard deviation COP 381,280. † effect in workers with experience. ‡ effect in workers without experience. † unconditional effect

# **B** Additional Components of Saber Hacer Vale

Beneficiaries of *Saber Hacer Vale* participate in the skills certification program, but additionally gain access to three additional components:

- 1. Motivational support: The program provides participants with a tracking mechanism (using text messages, emails, phone calls, or in-person aid) intended to avoid dropout. This component is only offered to treated individuals who do not show up for the evaluation process. This is something we can empirically test, and we believe it affects a very small number of people, if any, and should not significantly impact our main results.
- 2. Occupational support: The intervention includes a one-hour voluntary online training on using the digital platform *TuBio*, a digital tool that creates a curriculum template and provides recommendations on potential occupations. *TuBio* gathers information about the participant's prior education, experience, activities (such as hobbies, household chores, voluntary work, and others), languages, and competences (see Figure B.1 for a list of the offered competences). Based on this information, *TuBio* creates a curriculum template (an example is shown in Figure B.2) and provides feedback about potential occupations that might be of interest to the participant (Figure B.3 presents an example of recommended occupations for the profile shown in Figure B.2).

**Appendix Figure B.1:** Competences Required by The Occupational Support

Mis competencias				
+ Matemáticas	ō	Servicio al cliente	đ	Computadoras, electrónica y     automatización
+ Telecomunicación	Ō	🛞 Manejo de las TIC	â	+ Mantenimiento
Evaluación y control de     actividades	ā	+ Trabajo en equipo	ā	+ Pensamiento crítico 🗟
Comprenzión de lectura	-		-	(A) Comunicación asertiva
(+) Orientación al servicio	8	(+) Análisis de control de c	alidad 🖬	(+) Vigilancia de las operaciones 🖬
(+) Mantenimiento de equipos	ō	Manejo de imprevistos	ō	+ Reparación

Appendix Figure B.2: Curriculum Created by the Occupational Support



Appendix Figure B.3: Occupational Recommendations Given by the Occupational Support



3. Labor Market Platforms Training: *Saber Hacer Vale* provides beneficiaries with information about the Public Employment Service. This mainly includes access to the public job-search platform. During the first session of the evaluation process, participants receive information about these platforms. If they request it, they can then receive support to register on these services.

While it is true that *Saber Hacer Vale* includes these resources, we do not believe these components significantly affect our outcomes. There are three reasons for this rationale. First, access to *TuBio* and the Public Employment Service is completely free and available to anyone, regardless of program status. Furthermore, both resources are highlighted in the public description of *Saber Hacer Vale*, informing all participants (i.e., both treated and control groups) about their availability at the time of registration. This means that even individuals in the control group would be aware of their existence and free access, which diminishes any potential impact on labor outcomes for those in the treated group.

Second, participation in these resources remains entirely voluntary, even for individuals in the treated group. As a result, only a selected subgroup of participants, if any, will make use of them. This can be empirically tested, as data on requests for assistance with the platform will be collected.

Third, these resources are relatively low-touch, and are unlikely to have a substantial effect on the treatment outcome (Carranza and McKenzie, 2024; McKenzie, 2017; Kelley et al., 2024). We will provide evidence for this by gathering data on the use of these voluntary resources in both the treatment and control groups throughout the intervention. This data collection will include: 1) individuals who requested assistance (either with certification or the Public Employment Service); and 2) registration for *TuBio* and the Public Employment Service. These measures will help us identify those who use alternative tools and quantify any potential impact of confounding factors.