



SCHOOL OF
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The effects of the Venezuelan diaspora on Peru's labour market:
Evidence from the enactment of a Temporary Stay Permit to
Venezuelan migrants

By

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In January 2017, amidst the ongoing social strife in Venezuela, the Peruvian government enacted a working permit “Permiso Temporal de Permanencia” endowing Venezuelan migrants with the right to work and with access to health and education services. Given the spatial concentration of Venezuelan migrants in Peru and the clear temporal cut I unfold a difference-in-differences methodology to exploit the differences in the labor market before and after the policy was introduced at the individual level. Overall, I find an indirect effect of the policy on the Peruvian labor market through an increase in competition in the informal sector. The probability of being employed in the informal sector drops across the various educational levels. Moreover, workers with primary and secondary education report a decrease in their wages in the aftermath of the policy implementation. There is suggestive evidence that the TSP did not improve the assimilation of Venezuelan refugees in the formal economy.

Keywords: Refugees, forced displacement, migration, labor market, informal economy, Global South, education, Venezuela, Peru, Difference-in-Differences estimation.

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I. Introduction

“Migration is an expression of the human aspiration for dignity, safety and better future. It is part of the social fabric, part of our very make-up as a human family”

Ban Ki-Moon, 2013

Starting in 2014, the widely known and documented Venezuelan diaspora triggered an unprecedented flow of migrants reaching out to neighbouring South American countries. Even though the effects of the Venezuelan forced displacement rippled through the whole continent, it was most vividly felt in countries such as Peru, Colombia or Ecuador. Conversely to the migratory inflow in Colombia, largely studied, the Peruvian case is often overseen. Peru is to this day the second largest recipient of Venezuelan migrants since the onset of the crisis, sheltering roughly 1.3 million migrants or 20% of the total stock of Venezuelan migrants (UNHCR 2020). Even though Peru has traditionally hosted Venezuelan individuals, their presence before 2017 was rather marginal, with small stocks of Venezuelans, mainly settling in Lima capital, Callao and neighbouring areas (Superintendencia Nacional de Migraciones, 2020).

This large, exogenous shock starting in 2017, concurred with the introduction of the Temporary Stay Permit (*Permiso Temporal de Permanencia*), henceforth TSP, to Venezuelan migrants in January 2017, granting them the legal right to work, sign contracts and access health and education services (Superintendencia Nacional de Migraciones, 2020). Arguably, granting refugees labour market access will maximize their contributions in the host economy while improving their own well-being (Clemens, Huang and Graham, 2018). The enactment of the working permit to Venezuelan migrants, alongside a worsening crisis in Venezuela, propelled new waves of Venezuelans starting in 2017. However, those migratory inflows were partially disrupted in mid-2019 with the introduction of Visa requirements to all migrants coming from Venezuela. In fact, Peru experienced an outflow of Venezuelan migrants in the second half of 2019 upon the introduction of visa requirements, with roughly 17,7% of the Venezuelan population residing in Peru leaving the country (SNM 2020). This brief window sets up the time frame of interest to analyse the impact of the TSP on Peru’s main labor market outcomes, namely wages, informality levels, employment and hours worked.

The work follows the extensive literature analysing the impacts of migrants in the host economy labor market (Borjas 2003, Card 1990, among others). The study of migratory flows often revolves around the question as to what extent an increase in the labour supply has a discernible impact on labour market variables such as wages and employment. However, most of the pre-existing literature assess those effects between developing (sending) and developed (hosting) economies. The exogenous flow of Venezuelan migrants sets up the opportunity to analyse the impact of a sudden migration flow as a result of an ongoing political crisis in the sending economy between two developing countries (Peru and Venezuela). The impacts of large refugee cohorts differ to traditional migratory flows. Labor

migrants often embark themselves in the migrant journey due to a lack of resources and labour market opportunities in their home country, paired with high expected labour market returns in the host economy. Conversely, forced displaced populations, prior to the political changes worsening their living conditions, were relatively well-off in their home country (Borjas 1988). Precisely, Venezuelan migrants in Peru are relatively more educated than their Peruvian counterparts (Torres and Galarza, 2021). Furthermore, the fact that Venezuela and Peru are culturally close might create greater substitutability between migrants and Peruvian workers. In the light of the introduction of the TSP we may expect competition between immigrants and natives to fade away in the informal sector, settling in the formal economy.

In short, the study falls in the intersection of the labour market impacts of forced migrants in host economies from developing-to-developing economies (Peri and Yasenov 2015; Fallah, Krafft and Wahba, 2019; Cengiz and Tekgük 2018) and the implications of large amnesty programs (Bahar, Ibañez and Rozo, 2021). There is, to this day, scarce literature assessing the labour markets impacts of Venezuelan migrants in Peru (Morales and Pierola 2020) and to the best of my knowledge no literature assessing the introduction of the TSP in Peru's labour market, perhaps due to its relatively recent implementation. Therefore, this study adds to the emerging strand of literature assessing sudden migratory flows between developing countries but especially analysing the impacts of granting legal working status in such a scenario.

The introduction of the TSP offers a unique opportunity to explore the immediate consequences of granting legal status in the labour market. Given the nature of the policy I follow a *difference-in-differences methodology* (DiD) also used in akin studies (Peñazola and Pacheco 2019, Peri and Yasenov 2015; Bahar et al 2021) to exploit the differences between a control and a treatment group before and after the introduction of the permit (2015-2019). The study sheds light on several labour market figures such as wages, hours worked, unemployment or formality in the labour market. Given the geographical concentration of the Venezuelan immigration in Peru, and therefore of the TSP holders, we can draw a comparison between selected provinces which experienced not only this sudden increase in number of Venezuelan immigrants but also in TSP holders. Precisely 80,6% of TSP holders reside in the provinces of Peru and Callao. The Peruvian National Household Survey (*ENAHO* panel) endows us with the socio-economic characteristics of the working age (15-65) Peruvian population across the time period (2015-2019). Furthermore, I construct the Venezuelan share, making use of a *Bartik Instrument* and the share of TSP holders at the province level.

All the aforementioned things considered, the research question aimed to be approached in the ensuing lines is:

How did the introduction of a Temporary Stay Permit to Venezuelan immigrants in January 2017 affect wages, hours worked, informality and employment levels of Peruvian individuals across educational levels in the treatment provinces recipients of the migratory and policy shock?

The rest of the study unfolds as follows; first a brief overview of the Venezuelan diaspora will be provided followed by an analysis of the characteristics of the Venezuelan immigrants. Furthermore, an overview of the Peruvian context will be provided. It will follow a literature review of the migration impacts on the labour market and especially the intrinsic characteristics of refugee inflows in the host economy. The data and methodology part will precede the results from the baseline specifications and robustness checks before wrapping up the study with the discussion of the results and the conclusions section.

II. Context

II.1. The Venezuelan crisis

Venezuela was once a destination country for immigrants from all over Latin America, given its rich market, Venezuela could easily accommodate new inflows of labourers into its home market, especially within the thriving petroleum sector (Baldwin 2017). However, as of 2020, 5.2 million Venezuelan citizens have fled their homes, due to increased socio-economic unrest and scarcity of basic goods (UNHCR, 2020). From being the richest country in South America in the early 2000s it is now among the poorest (The Economist, 2017). The onset of the Venezuelan humanitarian crisis can be traced back to 2014, under Maduro's rule, when the Venezuelan people witnessed increased social unrest, propelled through growing authoritarianism coupled with growing unsustainable levels of public debt and regulations over the private sector. Altogether plunging the economy when the oil prices collapsed in 2014 (Bahar et al 2021). Since 2013 the Venezuelan economy has shrunk by 65 percent (Bahar and Dooley, 2019). Arguably, the Venezuelan crisis does not emanate from conventional warfare or social strife but the effects that Venezuelans face in their daily lives do not differ from what would be expected in a targeted war area (Bahar and Dooley, 2019). The ongoing crisis subsequently gained momentum, reaching its apex in 2018, with 87% of households living under the poverty line (Sequera, 2018) alongside plummeting socio-economic indicators such as mortality, caloric intake, or access to basic services (Jones and Pozzebon, 2018). Moreover, shortages of supplies became the norm, paired with increased violence, crippling inflation and a dramatic devaluation of the Venezuelan peso making the country a de facto failed state (Parent, 2017).

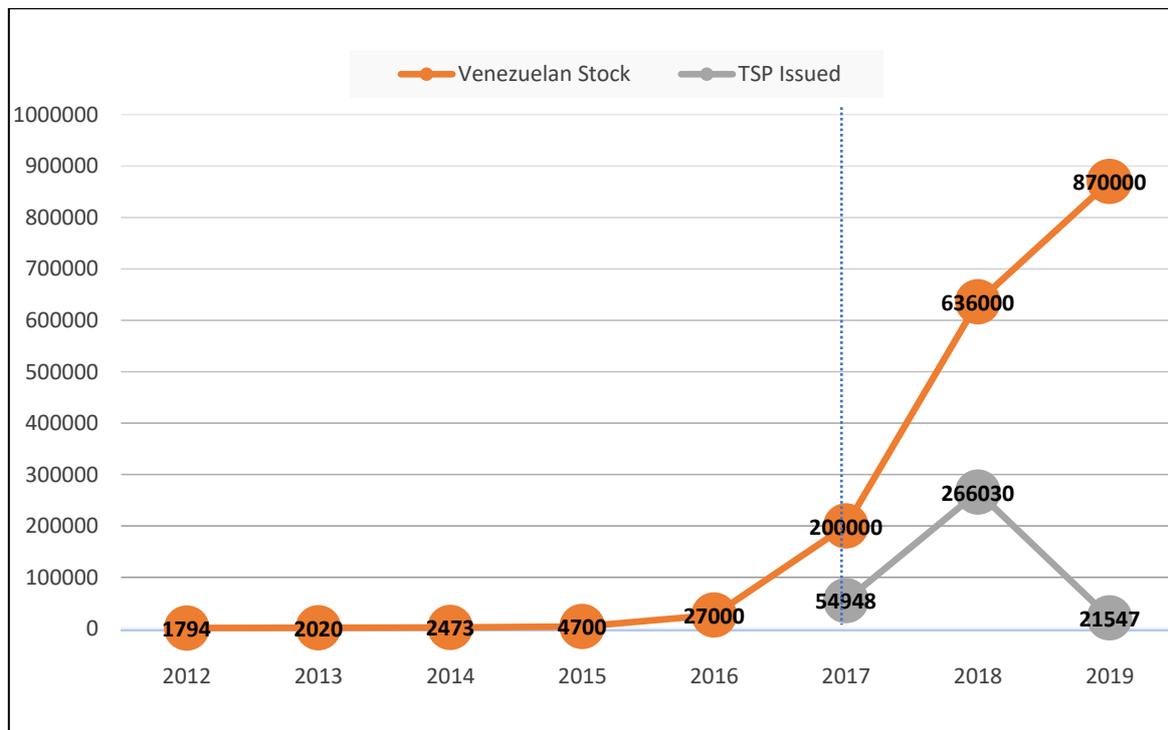
Particularly worrying for the Venezuelan economy are (see following section II.2), the characteristics of the Venezuelan immigrant population, mainly young individuals in their working age. This outflow of young citizens will definitely create labour supply frictions, with a loss of valuable workforce and

priceless human capital in the short term. Most of the effect will be vividly felt in the long-term as the economy will not be able to support an ageing population (Baldwin 2017).

II.2 Characteristics of the Venezuelan population in Peru

In order to approximate the effects (if any) of the TSP in the Peruvian labor market, this section will draw the main characteristics of the Venezuelan migrant population. First of all, *Figure I* resumes both the magnitude of the Venezuelan flow and the scope of this study. Clearly, the stock of Venezuelan migrants was rather stable and marginal prior to 2017, soaring in the aftermath of the introduction of the Temporary Stay Permit (TSP) and the worsening conditions in Venezuela, propelling increasing waves of immigrants. Undoubtedly, the migratory crisis reached its peak in 2018, both in crude numbers and in the number of TSPs issued to Venezuelans. After a short-term response of relatively open borders and the enactment of the TSP under President Kuczynsky (2016-2018), the country witnessed a reversal of the migratory policies during Martín Vizcarra’s mandate (2018-2020) with the repeal of the TSP over 2019 and the enactment of Visa requirements to all Venezuelan migrants starting on the 15th of June, severely disrupting the subsequent inflow of Venezuelans into Peru (Sistema Nacional de Migraciones, 2020).

Figure I: Stock of Venezuelan migrants in Peru and number of TSP issued between 2012 and 2019

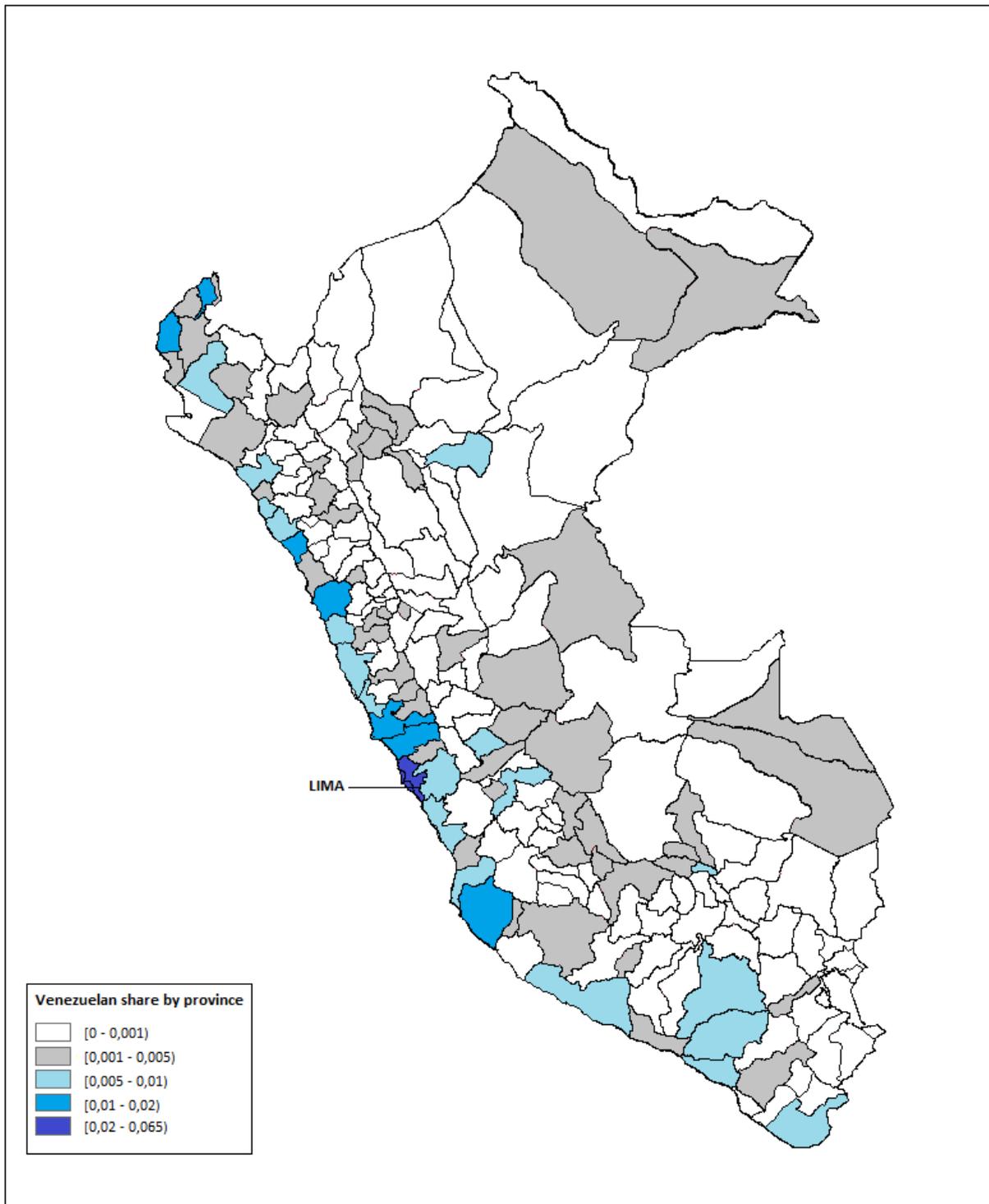


Notes: Author’s own illustration based on data from Superintendencia Nacional de Migraciones & INEI. 2017 marks the introduction of the Temporary Stay Permit.

Moreover, as seen in *Figure II*, the Venezuelan population is not evenly distributed within the Peruvian boundaries. Venezuelan individuals made up an appreciable share of the total population in the Provinces of Callao (6,63%) and Lima (6,41%) in 2019, a sharp increase compared to the Census results in 2017 with Venezuelan representing 1,61 and 1,52 percent of the total population of *Callao* and *Lima* respectively (INEI, 2019). Not only Lima stands out (alongside *Callao*) as the province with the higher share of Venezuelan migrants but also as the province with the highest absolute numbers. Precisely, 78,2 percent of Venezuelans residing in Peru were registered in *Lima* capital, whereas 8,4 percent settled in *Callao*. The remaining 13,4 percent resided primarily in the provinces of *Lima*, *Piura* and *Lambayeque*, also coastal and nearby regions (INEI, 2017).

Both the clear temporal cut, and the distribution of the Venezuelan population will dictate the methodology of this study. I will delve into a DiD strategy both assessing the prior and post 2017 scenario. Precisely I will consider in my analysis both provinces severely affected by the TSP (as seen by the share of Venezuelan migrants and TSP holders) and the counterfactual provinces, de facto not affected by the enactment of the TSP, reporting still no or marginal numbers of TSP holders.

Figure II: Share of Venezuelan migrants by province in Peru (2019)



Notes: Author's own illustration based on data from the 2017 Census and yearly inflows of Venezuelans. See section V.II.1 for the construction of Share. Geographical representation of the 195 provinces conforming Peru.

Additionally, Peru’s Statistics Office (*INEI*) undertook a far-reaching survey to Venezuelan migrants settled in Peru during 2018, what is known as *ENPOVE*¹, which endows us with additional information on the observable characteristics of those migrants.

Table I: Descriptive statistics Venezuelan population

Variable	Mean	Std. Dev.
Sex (Male)	.527	.499
Age	26.95	13.97
Working age	.818	.386
Aged 14-30	.471	.499
Single	.388	.469
Married	.200	.374
Employed	.746	.435
Informality	.885	.367
Hours worked	61,5	.471
Education level		
No education	.080	.233
Primary	.204	.355
Secondary	.365	.44
Tertiary	.351	.435
Title not validated	.966	.182

Notes: Authors own representation based on *ENPOVE* (2018)²

As seen in *Table I*, the age distribution of the Venezuelan population residing in Peru is particularly compelling within the integration of those migrants in the Peruvian labor market. A non-trivial 81,8 percent of the Venezuelan population is in their working ages (14-65), and young adults account for 47,1 percent of the total. Furthermore, they are more likely to be single (38,8%) than married (20%). According to the *IOM report on the Venezuelan situation in Peru upon entry* (DTM, 2017), regardless of their marital status, 60,6 percent of Venezuelans entering Peru tend to be accompanied by relatives whereas 35,6 percent migrate on their own.

¹ The *ENPOVE* survey to Venezuelan migrants gathers data on 3,611 households adding up to 9,487 individuals from the departments of Tumbes, La Libertad Cusco and Arequipa and the provinces of Lima and Callao. It gathers data from 2017 Census data and Venezuelan applicants to the TSP. The survey was deployed between November and December 2018.

² Working” captures individuals who claim to have worked at least 1 hour in the previous week. “Informality” captures the share of individuals working without a contract. “Tertiary” education stands for individuals who have completed higher education, either at University level or in a technical school.

The striking share of Venezuelans working in the informal sector (88,5%) can be explained by the high barriers to obtain formal employment in Peru's labour market prior to the introduction of the TSP. Moreover, the high share of Venezuelan migrants working in the informal sector can be explained by, as we will see, the high degree of informality in the Peruvian labor market. Additionally, 96,6 percent of Venezuelans holding an educational certificate were not able to validate it upon arrival in Peru, therefore being pushed into occupations not suitable to their set of skills, downgrading their skill occupation in the short-term.

Despite the poor validation rates, Venezuelans conform a relatively well-educated migrant population, with roughly 70% of them holding an education degree above the primary level, and 35,1% holding a higher education certificate (tertiary education). Therefore, the enactment of the TSP may have detrimental effects on the labour market, as skilled individuals may gradually move from informal and low-skilled jobs into occupations that better match their true set of skills. Furthermore, the majority of the Venezuelan population have completed a higher number of years studied than the average of Peruvian population (Torres and Galarza, 2021). The introduction of the TSP represents a new paradigm for Venezuelan migrant workers as their previous option to get a legally binding working permit was through the approval of a citizenship status. Moreover, the enactment of such labour market access to the migrant or refugee population can also represent a new paradigm for the host economy, as it can benefit from an inflow of highly educated workers (Clemens, Huang and Graham, 2018). Precisely, the inflow of educated doctors, lawyers and teachers will help fill the gap in Peru's growing market of formal workers if policies such as the TSP are sustained through the following years (El Nacional, 2020). Undoubtedly, considering the wage premium associated to the formal economy, especially in Latin American countries, due to the significant wage gaps between the formal and informal sector (Maurizio, 2019) we would expect Venezuelan migrants to harness the opportunity to climb up the occupational and wage distribution upon obtaining the TSP.

II.2.1 Temporary Stay Permit

Amidst the ongoing erosion of Venezuela's socio-political framework, Peru enacted the TSP in January 2017. The number of total TSP issued over the period 2017-2019 was 357,445 with most of them granted in 2018 (266,030), the year with the largest inflow of Venezuelan migrants crossing the Peruvian border (Superintendencia Nacional de Migraciones, 2020). By 2019, 49% of all Venezuelans residing in Peru were holders of the newly introduced permit (Selee and Bolter, 2020). The TSP granted the right to work and access health and education services to the Venezuelan population during one year with further renewals. Following the distribution of the Venezuelan share, most of the TPS holders (77%) are residing in *Lima's* department and basically within Lima city (75.2%) whereas roughly 13% settled in the neighbouring coastal areas of *Callao*, *Trujillo* and *Huaral* (Superintendencia Nacional de Migraciones, 2020).

Arguably, the enactment of the TSP falls within Latin's America long commitment (at least on paper) to protect and give response to internally forced displaced individuals. In fact, the vast majority of Latin American countries are signatories of both the 1951 *Refugee Convention* and its 1967 *Protocol*. Furthermore, the *Cartagena Declaration*³ (1984) set the normative framework and the regional approach for policies and actions in the forced displacement scenario (Jubilut, Espinoza and Mezzanoti, 2019). In fact, the Declaration and subsequent renewals of this pledge⁴ prove the continent's tradition and willingness to protect those at risk of being persecuted in their home countries (Parent, 2017). The Cartagena Declaration broadened the previous definition of refugee from the 1951 *Refugee Convention*, given the refugee status to individuals who:

“have fled their country because their lives, safety or freedom have been threatened by generalized violence, foreign aggression, internal conflicts, massive violation of human rights or other circumstances which have seriously disturbed public order”

Jubilut, Espinoza & Mezzanoti (2019)

However, most of the previous agreements on how to cushion the impacts of forced displacement, endowing refugees with a protective and safe environment, have not propelled any set of far-reaching policies in the host countries. Latin American countries are confronted with increasing politicization of migration and anti-immigrant sentiment as well as contempt for human rights and refugee laws (Jubilut et al, 2019). Countries such as Brazil, one of the biggest recipients of Venezuelan migrants in Latin America had barely processed any of the 4670 asylum applications between 2012 and 2016 (Parent, 2017). Similarly, Mexico could not process 3,067 out of 4,042 asylum applications filled by Venezuelans in 2017 (Feline and Parent, 2018). Therefore, the TSP emerges as a stepping-stone towards a deeper commitment to the preservation and restoration of refugee rights in Latin America.

II.3 The Peruvian context

In order to fully grasp the actual implications of such regularization process in Peru it is worth taking a snapshot at the Peruvian socio-economic situation. Peru's recent economic history is a turbulent and unsteady path towards joining the upper-middle country group, which the country arguably achieved in the 2010s (OECD, 2019).

In a first contemporaneous epoch (1968-1990), the state-centred approach unfolded the import-substitution industrialization (ISI) policies, acting as the backbone of the industrialization process (Berrios, 2018). However, such policies did not have the desired outcomes. The protectionist view, promoting the domestic market rather than opening up the economy led to a period of economic decay

³ The Cartagena Declaration, initially adopted by 10 states, was created in the Colloquium on the International Protection of Refugees in Central America, Mexico and Panama, held in Colombia in 1984. It builds upon the 1951 Refugee Convention and its 1967 Protocol.

⁴ For instance, see the San José Declaration (1994), Mexico Declaration (2004) and Brazil Declaration (2014).

marked by price volatility and inflation (Berrios 2018). This erratic macroeconomic behaviour triggered winds of change in the 1990s with the introduction of new and more liberal economic policies, making the private sector the anchor of the new policy-setting. The Fujimori administration (1990) was the first to unfold a series of macroeconomic reforms aimed at strengthening the private sector through a liberalized economy with subsequent governments following suit (Chong, Galgo and Saavedra 2008). Those structural adjustments, following IMF's traditional receipt, consisted of fiscal discipline, limited public spending, financial and trade liberalization, the promotion of Foreign Direct Investment (FDI) and privatization (Berrios, 2018; Chong et al 2008).

Those efforts towards a more open, competitive economy have had, so far, mixed results. Firstly, the country has persistently lift individuals out of poverty. The period encompassing 2005-2016 witnessed the share of the population living on less than 5.5 USD a day to drop by half (OECD, 2019). Furthermore, the country has experienced GDP growth above the average Latin American performance (see *Figure A.I* appendix), albeit alternated with episodes of economic downturn (Pastor and Meoño, 2019; Berrios, 2018). Peru's economic volatility is paired with widespread unemployment, mainly in the country's capital, Lima, undoubtedly the economic hotspot in Peru. In fact, Lima produces about 75 percent of the economy-wide GDP, employing roughly 5.5 million people out of 16 million economic active individuals (Pastor and Meoño, 2019). Therefore, most of the decline in unemployment in recent years can be explained through an improved employment scenario in Lima, where the unemployment rate fall from 6.5 percent in the early 2000s to around 6 percent in 2017 (Pastor and Meoño, 2019).

Most of the changing trend in unemployment is seen through an upsurge of employment in the service sector (see *Figure II* appendix), whereas employment in the primary sectors (namely agriculture and fishing) alongside manufacturing dimmed (Pastor and Meoño, 2019). Arguably, the comparatively good performance of the service sector did not propel any economy-wide productivity growth, due to the labour-intensive nature of the sector. Precisely, total factor productivity (TFP) growth was negative between 2001-2017 at -0.5 percent (OECD, 2019). Nevertheless, Peru, as any economy in the Global South does not per se have an unemployment problem but rather an employment problem (Fields, 2011). Despite reporting earnings, most workers are in a fragile situation, still settled below the poverty line. Undoubtedly, informality explains part of the picture. As workers lack the safety nets to endure in the event of unemployment, and governments cannot effectively enforce a shift towards formality, informality rates remain sticky and high in those economies (Fields, 2011; Malone, 2003)

Even though informality is a widespread phenomenon in countries of the Global South, Peru emerges on top of those figures. Different studies on job informality in Peru, place informal employment to represent roughly 70% of the total employment (Velapatiño, Grippa and Perea, 2017; OECD, 2016),

whereas the Latin American average is around 51% (OECD, 2019). Governmental efforts⁵ aiming to tackle job informality have so far been futile in order to tackle job informality as it remains the main source of employment in the country, impregnating all economic activities (Morales and Pierola, 2019).

III. Theoretical framework

The neo-classical theoretical model embrace the basic idea that after a shock in the labor supply, via an inflow of migrants, *ceteris paribus*, would create downward pressure on the salaries earned by workers. These migrant inflows are, according to the early neoclassical theory, propelled through push and pull factors (Harris and Todaro 1970; Piore, 1979).

On the one hand, push factors emanate from living and working conditions in the sending economy. As individuals foresee monetary gains in the host economy, they will tend to emigrate as to maximize their own utility. In a nutshell, migration will unfold as long as the expected real income is higher in the receiving economy (Harris and Todaro 1970). On the other hand, Piore (1979) embodied pull factors as a channel through which immigration occurs. In fact, migration can be regarded as an inescapable consequence of economic progress (especially in early stages of economic development), endowing industrial economies with cheap labour, willing to work under rough conditions and instability. The neo-classical theory asserts that at the macro-level, migration patterns will contribute to the optimal allocation of factors of production, creating labour flows from poor to wealthy regions and inverse flows of capital (de Haas 2021).

Clemens (2011) contextualises the outcomes of free migration in the labor market of the host economy, assuming that the demand for labour is a decreasing function of the respective wage rate and that factors of production prices and other inputs are exogenous. Clemens argues that in an open-borders set up, we would witness an increasing labour supply in the host (rich and labour scarce) economy, pushing down wages (increasing labour supply), benefiting the capitalists – owners of the factors of production – at the expense of workers' welfare (wages). Conversely, sending countries would experience shortages of labour ultimately leading to increases in workers' wages. However, the reality deviates from such a set up in the sense that labour markets are inadequately captured by a simple supply and demand framework, there are different skill distributions along the skill-ladder and immigrants intrinsic characteristics will determine their impact in the host economy. Likewise, native individuals will adjust to this dynamic labor market depending on their set of skills, preferences, their elasticity (responsiveness) to wage changes, and their within country mobility (de Haas, 2021).

⁵ In 1991, the Fujimura administration enacted the "*Ley the Fomento del Empleo*" aimed at easing labor market rigidity. More contractual types were introduced alongside cheaper hiring and termination of contracts costs. Furthermore, bureaucracy processes were relaxed, altogether promoting the formal economy (Chong et al 2008).

Firstly, the skill-distribution of the newly arrived immigrants will be crucial as to determine which groups will be mostly affected by the shock. Nevertheless, note that there may also be skill complementarities in the labor market between natives and immigrants (Clemens, 2001). In fact, Borjas (1999) claims that natives in the host economy may in fact benefit from immigration as long as immigrants and natives differ in their productive endowments, therefore creating non-competing synergies in the job market and even skill complementarities boosting economy-wide productivity levels. Therefore, native individuals whose productive endowments are complementary to those of immigrant's benefit, while natives whose endowments are competing with those of immigrants lose.

Even though most of the emphasis has been traditionally placed upon salaries, the effects of a labour supply shock can also be felt in employment levels. Arguably, the mechanism that will dictate to what extent the shock influences income or employment is the elasticity of the labor supply, in other words, how native employment reacts to wage changes (Borjas 1995). Assuming a lack of labor mobility, if natives are responsive to wage changes, the immigration shocks will be transmitted through unemployment. Native workers, unwilling to accept decreasing wages will be pushed out the labor market. Conversely, if the labour supply is relatively inelastic (native workers are unresponsive to wage changes), then immigration shocks will trigger lower wages as native workers will accept the new wage-setting. However, the absence of labour mobility not always holds. In fact, native workers may respond to wage changes and increased unemployment moving into neighbouring regions as generally immigrants cluster in a small number of geographic areas (Borjas 2003). That clustering of immigrants into certain geographical areas poses further challenges in the assessment of the immigrant impacts in the labor market. Labour migrants (intrinsically different from family-based migration or forced displacement) settle in relatively rich regions and have higher levels of geographical mobility, due to fewer ties within the host regions, enabling them to move into growing regions and leave stagnated ones (Foged & Peri, 2016). Therefore, if immigrants are not randomly distributed there could be a spurious correlation between immigration and wages (Borjas 2003). Similarly, the entry of labour migrants into the host economy is driven by the economic cycle, or what is known as in-or-out migration, peaking during economic expansion and plummeting during economic downturns (Dustmann, Frattini and Preston 2013).

Most of the contemporaneous literature has been stressing that the effects of migration inflows are to be addressed at the geographical level (Altonji & Card 1991), across the skill-distribution (Borjas 2003) or as a combination of both the geographical and the skill approach (Card 2001). Precisely, the spatial approach, as developed by Altonji and Card (2001) uses the variation of the fraction of immigrants in various cities to determine the impact on the labour market outcomes of less-skilled individuals. The authors assume (based on US-centred trends) that new inflows of migrants will compete against low-skilled individuals. Therefore, Altonji and Card (2001) consider both low-skilled natives and immigrants as the same unit, thus competing for the same job market opportunities in a given

geographical area. Hence, by comparing the industry distributions of less-skilled natives in cities with relatively high and low immigrant densities the authors are able to document to what extent immigration displaced less-skilled natives from certain industries or local labour markets.

Turning into the skill-cell approach, Borjas (2003) argues that addressing the immigrant impact on the labor market from the geographical perspective would be a 'zero sum game' as natives might respond to the wage impact of immigration (assuming that they are responsive to wage changes) by moving into other local labour markets. Therefore, immigration would eventually affect every local market either directly or indirectly. As previously mentioned, a second concern from the geographical or local labor market analysis is the documented association between immigrants settling into high-wage regions, drawing a spurious correlation and hampering a clear-cut analysis. Therefore, Borjas conjectures that by looking at a particular skill group we would be able to see the true impact of migration. Conversely to the local labor markets approach, the size of the native workforce in each of the skill groups is rather stable, so that movements along the skill-distribution, hampering the interpretation are less likely to occur. However, Borjas' critique on the spatial approach, and therefore the suitability of his approach relies on the assumption that we have relatively high elasticity of labor supply (workers highly responsive to wage changes) as well as high labour mobility within country.

Lastly, Card (2001) bridges the gap between these two approaches by considering both the spatial and the skill element of the immigration effect. Card adds the role of mobility as an offsetting element of immigrant inflows. However, in the absence of such within country mobility flows, each migrant will add one person into a particular local labor market and skill-cell. As to create a working framework, Card attaches a mobility probability to each individual based on observed individual characteristics such as education, age, nationality or ethnicity. Therefore, even if the effect of migration on wages may be close to zero, either country-wide or across the skill distribution, certain groups will absorb part of the shock distinctly more than others, possibly depressing wages of workers in competing labour market segments with immigrants, assuming low within country mobility (Dustmann et al 2013). Conversely, the effect of migration on labour market outcomes will fairly dissipate in the event of high labor mobility, partially offsetting some of the implicit negative effects of migration inflows.

Purportedly, my study echoes Borjas' (2003) spatial approach by comparing regions that did not witness an increase of Venezuelan individuals to the regions mostly affected by the Venezuelan diaspora and therefore also display higher amounts of TSP holders. Additionally, the skill-cell approach will be incorporated as to explore the impacts of the TSP across educational level groups.

Unmistakably, all the aforementioned theories fall within neo-classical equilibrium models, where push and pull factors and individual utilitarian maximization through cost-benefit calculations conform the normative framework. These theories, also known as functionalist theories (de Haas, 2021), although prominent in setting the foundation as to further develop migration dynamics, are to a certain degree

flawed. Individuals under the neoclassical framework are seen as mere movable pieces fluctuating according to macro supply and demand forces. This theoretical set up largely ignores the free will of individuals to migrate for reasons other than monetary or financial-conscious decisions. For instance, forced or humanitarian displaced individuals do not have a real option to stay in the country without placing serious risk on their individual freedom as they can potentially be persecuted, injured or murdered (de Haas 2021). Furthermore, the sound reasoning behind neoclassical models, considering migration as a channel providing individuals and households better job market prospects, increasing their overall livelihood, does not acknowledge the many barriers immigrants face (de Haas 2021). In fact, poverty, inequality and governmental restrictions such as quotas or entry bans effectively hamper the normal fluctuation of individuals. Peru's relative open-borders and welcoming policies (2017-2019) as seen through the introduction of the TSP is normally not the norm, as countries tend to have hostile attitudes to migrant and refugee individuals (Coenders, Gijsberts, and Scheepers, 2017).

Furthermore, immigrants within the neoclassical model are seen as bare inputs of a fixed production function, only affecting the relative price or wage through increasing or decreasing the supply of labour. However, contemporaneous literature (Borjas and Monras, 2017; Alesina Harnoss and Rapoport, 2013) incorporate migration as a detrimental factor in shaping the "general equilibrium", ultimately affecting overall productivity levels in a given aggregate economy. Immigrants, especially high-skilled labourers, may trigger an outward move of the production function by incorporating new ideas and knowledge into the economy (Dustmann et al 2008). Therefore, considering the educational background of most Venezuelan migrants, Peru might experience improvements in its productive structure if it is capable to accommodate those high-educated workers in the formal economy. Interestingly, more diversity of the immigrant population is also positively associated with productivity levels in host labour markets with a stronger effect for skilled immigrants in richer, more productive countries (Alesina et al 2013; Dustmann et al 2008).

Lastly, those previous theories echo and are rooted in developed countries, especially in the United States, undoubtedly a landmark in the study of migration dynamics. Even though the literature on immigrant impacts on developed countries is a stepping-stone towards a better understanding of how migrant dynamics may affect the labor market, migrant cohorts are intrinsically different across countries, and their assimilation in the host economy will depend upon a large set of individual characteristics, such as schooling, age, culture or language. Indeed, this set of skills and socio-economic traits will determine the pace and range of the immigrant assimilation in the host economy.

V.1 Skill downgrading

Generally, even though immigrants are often equipped with akin background education relative to natives (The World Bank 2018), this human capital cannot be fully harnessed in the host economy due

to employer preferences or “tailor-made” industry and country skills (Friedberg 2000). Normally, employers are confronted with lack a of knowledge relative to immigrants’ productivity compared with native-born individuals with alike observable characteristics (Chiswick 1978). Furthermore, immigrants cannot always certify their previous education due to bureaucracy entanglements or poorly defined cross-country validation methods. This de facto loss of human capital upon arrival, due to employer preferences and information asymmetries, have immediate consequences on the labour market outcomes of immigrants, ultimately leading to job downgrading upon arrival. They often end in occupations that do not suit or reach to their true set of skills (Friedberg 2000). The stock of knowledge immigrants and refugees gathered prior emigrating reflects home-country socio-cultural and labour market characteristics, thus not being an accurate predictor of “effective” human capital in the host-country (Dustmann 2013).

Therefore, the skill downgrading concept is paramount in correctly asserting the impacts of migrant inflows in the host economy. Following the skill-cell approach (Borjas 2003), as knowledge and skills are not perfectly mobile across countries, immigrants may not be directly competing against comparable groups of native-born individuals but against relatively unskilled individuals. Ultimately, not properly accounting for the skill-downgrading upon arrival may hamper the validity of the results or the channels through which immigration might affect the labour market. Precisely, as seen in *section II.2*, the Venezuelan population residing in Peru is apparently better educated than the native Peruvian population, in terms of both educational attainment and higher education completion rates. However, Venezuelans may not be competing against comparable groups of Peruvian workers, even though they are not too dissimilar in their socio-economic and cultural characteristics. For instance, newly arrived Venezuelans will certainly lack the knowledge about labour market networks plus only a marginal amount could certify their higher educational achievements upon arrival (Superintendencia Nacional de Migraciones, 2020).

IV. Literature on forced displacement impacts in the host economy

Having previously assessed the analytical backbone of the immigration impacts on the host labour market, now we turn to both the impacts of refugee or forced displacement inflows in the host economy and the migration patterns and impacts between two developing economies. Conversely to the developing-developed country setting, largely explored, immigration between two developing economies is a relatively uncovered topic, although it poses a great opportunity to unveil different shocks to the local labour market. The impact of the migratory flow between two developing economies (here Peru and Venezuela), that are very similar in their socio-economic and cultural characteristics detach from developing-developed migration patterns, as migrants are usually dissimilar in their cultural and skill endowments (Peñazola, 2019).

Undoubtedly, Card's (1990) study of the impact of the Marielito boatlift on Miami's labor market, is to this day a prominent work in assessing the impacts of a large, sudden inflow of refugees into a local labor market. Card's use of a DiD strategy, including the treatment group (Miami) versus a control group, not affected at all by the migratory inflow, prior and post the migrant inflow, has paved the ground for akin studies also exploring the nature of refugee shocks through a DiD estimation (Peri and Yasenov, 2016; Bahar et al 2021; Ruíz and Vargas-Silva, 2016; among others). However, contemporaneous studies have disputed Card's earlier work (Borjas, 2003 and 2017; Peri and Yasenov, 2015). On the one hand, Peri and Yasenov (2015) reconsidered Card's control group, which they regard as arbitrary. The validity of the control group (Los Angeles, Houston, Atlanta and Tampa Bay) was never formally tested, namely through a comprehensive comparison of labour market trends prior and post the immigrant shock, what is known as parallel trends, indicating the suitability of a control group juxtaposed with the treatment group (Schwerdt and Woessmann 2020). Card's only use of one year as a pre-treatment period while using four years of post-treatment period does not seem enough as to evaluate those trends (Santamaria, 2019). On the other hand, Borjas (2003 and 2007) argues that the effect has to be examined along the skill distribution, where the skills of the immigrant workforce have to be matched with those of the incumbent group. On these grounds, contrary to Card's view that the Cuban refugee inflow did not have a discernible effect on the average worker in Miami, Borjas finds that it indeed affected salaries of early school dropouts and low-skilled individuals. Nevertheless, Borjas ignores the geographical scope of the labor market, which might have counterbalancing forces (Santamaria, 2019).

Amidst the sound relevance and increasing debates, Card (2001) re-examined his seminal work, adding the concept of "skating rink mobility model", by which one migrant settling into a certain geographical area would push another native off the rink, considering the labour mobility idea. However, his results show that between 1980 and 1990, adding one migrant in the low-skill population would increase the total low-skilled population by approximately one, refuting the hypothesis of inter-city labour mobility.

Regardless of the new evidence and methods re-examining Card's early work, Card undeniably sowed the seeds as to exploit a natural experiment within the migration field, precisely within the developing-developed framework. Consequently, an emerging strand of literature has been documenting this exogenous migration flows in the sending economies, particularly Syrian refugees sheltering in Turkey (Tumen, 2016; Cengiz and Tekgük 2018; Fallah et al 2019) and Venezuelans spreading across neighbouring, South American countries (Bahar et al 2021; Peñazola, 2019; Morales and Pierola 2020). Despite the fact that the Syrian and Venezuelan diaspora share the nature of the outflow, propelled through within country instability, prosecution and life-threatening conditions, individuals fleeing may differ in their productive endowments. Hence, we may expect different outcomes in the host labour markets. For instance, a sizable number of Syrian migrants, that settled in Turkey have not completed high-school education, plus they are not Turkophones (Cengiz and Tekgük, 2018). Therefore, we might

expect competition to unfold in the lower-end of the skill-distribution and in the informal economy. Indeed, this is showcased by Tumen (2016), whose results find small but statistically significant informal employment losses among natives in Turkey, paired with small wage losses among the same group (Cengiz and Tekgük, 2018). Conversely, Venezuelans are relatively well-educated compared to their natives' counterparts in countries such as Colombia (Bahar, 2021) and Peru (Morales and Pierola, 2020; Torres and Galarza, 2021). Hence, we might not expect an overwhelmingly competition in the bottom-end of the skill-distribution or in the informal sector, especially in Colombian and Peru. In fact, both countries have enacted large regularization programs to the Venezuelan community, granting them legal working status. However, the evidence points to the opposite direction. As previously seen, Venezuelans are largely present in the informal sector upon arrival (*ENPOVE*, 2018) due to both difficulties validating their educational and professional certificates and as a result of Peru's high degree of labour market informality.

Nevertheless, we might still witness complementarities rather than competing dynamics in sectors where the refugee cohort is overrepresented. As long as natives and refugees in the same skill level are endowed with different capabilities, performing different tasks, the competition for jobs may largely fade away, with cooperation gradually taking over (Borjas, 1999; Ottavino and Peri, 2012).

IV.1 The labor market effects of the Venezuelan diaspora

The Venezuelan shock poses a unique opportunity to study the short-term effects of a sudden exogenous inflow of migrants through a natural experiment. Colombia, the largest recipient of Venezuelan migrants in the world has attracted most of the empirical work addressing the labor market impacts of the Venezuelan diaspora, with emerging but still scarce literature in Peru. As previously seen, labor market informality is omnipresent in Peru, impregnating all economic activities, being the most prominent type of employment in Peru (Velapatiño et al 2017, OECD, 2016). Seemingly, informality is vividly present in the Colombian labor market (Herrera-Idárraga, López-Bazo and Motellón. 2015). This feature of the Colombian and Peruvian labor markets explain, to a large extent, the high employability of the Venezuelan migrants in the host labor markets. Consequently, studies grounded in Colombia serve as a good analogy as to approximate the Venezuelan diaspora in Peru. Moreover, the unfolding of the events in Latin America, as a response to the Venezuelan crisis, has provided scholars with new scenarios as to address those problems. On the one hand, the border closing between Colombia and Venezuela in August 2015, with its re-opening in mid-2016 prompted an unprecedented inflow of Venezuelans in Colombia. On the other hand, the aforementioned regularization processes, granting labour market access to Venezuelan migrants as well as providing health and education services emerge as some of the short-run responses to the Venezuelan diaspora.

Given the nature of the Venezuelan diaspora, not being evenly distributed across a country's territory and following Card's (1990) seminal work, this and previous studies have made use of a DiD strategy

(Santamaria, 2019; Peñazola 2019; Bahar et al 2021). This relatively uneven distribution of the Venezuelan settlements creates a good baseline scenario with control and treatment groups, conditional on that both groups experienced similar trends in labour market outcomes prior the shock. Generally, studies in Colombia found a marginal negative impact, albeit statistically significant, of the Venezuelan share on the wages of workers in the informal sector (Peñazola, 2019; Santamaria 2019), alongside declines in the real wage of low-skilled workers in the formal sector (Santamaria, 2019). Those findings suggest that, at least in the short-term, new inflows of Venezuelan workers will compete at the bottom end of the skill-distribution and in the informal sector, proving to some extent the skill downgrading concept (Friedberg 2000, Dustmann, 2013). Plausibly, the local labour market in Colombia could not accommodate such inflows of workers in the short-term. Moreover, Venezuelan individuals and natives in Colombia in the low-skill distribution may have similar set of skills, increasing competition in this job market segment, conversely to Ottavino & Peri's (2012) job market complementarity view.

Although the literature on refugee inflows in the host economy often revolves around *how much* or what are the crude numbers of such inflows, the fundamental question to be addressed is *how*. How countries are accommodating such individuals within their borders and labour markets. As previously seen, migrants and refugees have the potential to positively contribute in their host countries. Therefore, in order to amplify their contributions, they need formal labour market access (Clemens, Huang and Graham, 2018).

As this study is assessing the impacts of the introduction of the TSP (Temporary Stay Permit) in the Peruvian labour market, studies addressing such regularization of immigrant rights following a refugee inflow are both scarce and crucial. Again, Colombia emerges as a convenient comparative case due to the introduction of a temporary residence Visa permit in January 2017, further extended in February 2018, to Venezuelan migrants. In a similar fashion as the TSP, the permit allowed Venezuelan individuals to join the formal sector in Colombia, as well as granting them the right to access government services such as education or health (Bahar et al 2021). Therefore, we might witness the effect of the working permit to affect the formal sector, fading away from informal and low-skilled jobs. Bahar et al (2021) provide such comprehensive study. The authors did not find any discernible impact of the large-scale regularization policy on any of the main labour market outcomes, namely hours worked and wages. Nevertheless, the authors document a negative effect on employment in the formal sector, mostly for highly educated native workers, albeit the results remain negligible. Although the reasons behind this small aggregate effect on the labour market are manifold, the authors focus on the hesitance of employers to hire Venezuelan workers and the short time horizon of the study (two years after the implementation) as the main explanatory factors.

In brief, the impact of such regularization process on the labor market outcomes of refugees, according to Clemens et al (2018), will depend on four main factors. First of all, the skill profile of refugees will

determine their complementarity in the job market, influencing labor market outcomes. The same skill profile will also determine whether refugees' abilities are suitable in the formal or informal sector and the extent of the impact of granting them formal labor access. A third, factor, as previously seen, is the host labor market characteristics. If the informal market is large, which is the case in Peru, then granting formal access will likely have a marginal impact. Lastly, the host's policy choices will determine the extent and speed of refugees' assimilation process.

Therefore, in the light of the difficulties to obtain one of the scarce, coveted jobs in the formal sector even for the Peruvian workforce, we might expect any shock in Peru's labor market to significantly affect the informal economy. Precisely, as pointed out by Morales and Pierola (2019) the Venezuelan diaspora had a negative effect on Peru's informal economy. The authors analyse the Peruvian labor market after 2017, finding that an increase in the Venezuelan share in a given province had detrimental effects in the probability of an individual being employed in the informal sector alongside a drop in wages. It is left to see, though, if the enactment of the TSP likely affected the informal economy or if some effect can be perceived in the formal sector. Clemens et al (2018) point out to the marginal effect granting labour market access to refugees if the labor market in the host economy is primarily informal

V. Main hypotheses

H1: Given the enactment of the TSP in 2017, the subsequent large inflow of Venezuelan migrants and the spatial distribution of the Venezuelan migrants, I expect a shock in the labor market to occur post 2017, not before, altering trends in either wages, hours worked, employment or informality.

H2. First of all, whether the effect of the TSP will weigh more on wages or employment will depend on the responsiveness (elasticity of the labor supply) on wages. Due to the lack of safety nets, and the large penalty of being unemployed in Peru I expect the effect to be mostly felt in wages.

H3. Despite the fact that these Venezuelan workers now can compete in the formal economy, the rigidness of the Peruvian labor market, the large informal economy and the likely effect of the TSP as a call factor propelling new waves of Venezuelan migrants may in fact cause an effect on the informal rather the formal economy. Therefore, having detrimental effects for workers in the informal sector if they cannot be accommodated in the formal economy.

H4. I expect the effect to take place across individuals with lower educational levels. The effect will take place through the poor validation rates of Venezuelan's educational certificates, the resistance of employers to hire Venezuelan migrants and the large informal sector in Peru.

VI. Methodology

As to address the impact of the Venezuelan shock, and particularly the enactment of the TSP, in the Peruvian labor market the main labour market indicators presumably to be affected will be analysed. The indicators conforming the dependent variable in the different benchmark specifications are wages (monthly), hours worked (weekly), employment and informality.

The distribution of the Venezuelan share (and TSP holders) across the Peruvian geographical landscape (see *Figure II*) after 2017 and the nature of the shock offer a unique opportunity to address the labour market implications through a natural experiment. Whereas Venezuelans accounted for a significant share of the local population in the provinces of *Lima*, *Callao* and neighbouring areas, other provinces had not experienced any significant increase in the number of Venezuelan migrants. Similarly, TSP holders clustered in the aforementioned areas. The fact that Venezuelan cohorts were rather marginal before 2017, and the TSP was enacted in 2017, with no such permit established before, allows the comparison of two distinct scenarios, before and after 2017 distinguishing between provinces affected by the Venezuelan shock and the enactment of the TSP and provinces not affected at all.

In an ideal set up, we would like to observe the same individuals at the same point in time both in the treated status and in the non-treated status. Logically, this is not possible. Therefore, we need to estimate what could have happened in the counterfactual that has to resemble as much as possible the treated group. In other words, we want to assess what outcome a treated individual would have had if he had not been treated. The central idea of most techniques addressing such natural experiments is to obtain two groups (treatment and control) whose separation was purely random. The randomness ensures that the two groups do not systematically differ in other characteristics (Schwerdt and Woessmann, 2020).

However, such tailor-made counterfactual is practically unattainable, and thus the literature is resorting to natural experiments, especially within the field of forced displacement, as to see the real impacts on labour market indicators, often through DiD analysis (Cenzig and Teknük, 2018; Santamaria, 2019, Peñazola, 2019; among others). The essence of the DiD approach is that in the first period, none of the groups is exposed to the shock. In the second period, only one of the groups gets exposed to the treatment with the other left unaffected. The key element of the DiD strategy, is that the two groups (treatment and control) might be observationally different, dropping the assumption in standard tradition methods (such as randomized control trials) that both groups have to be similar and ideally identical in terms of all relevant unobserved factors (Schwerdt and Woessmann, 2020). Nevertheless, we need that those differences are constant over time⁶ (in absence of the treatment). As we cannot see what the trends would have been in the absence of the shock, the identification assumption of the DiD approach is that the group-specific trends in the outcome of interest would be the same in the absence

⁶ Panel data allows us to undertake such methodology as the same individuals are tracked over time. Therefore, the observational units change their treatment status between two incidents of observation.

of treatment (Swerdts and Woessmann, 2020). This assumption can be supported by observing both the treatment and control groups moving in parallel prior the shock.

In a nutshell, the aforementioned strategy will compare the provinces affected by the exogenous shock, conforming the treatment group and a set of de facto unaffected provinces operating as a control group, conditional to meet certain requirements, namely parallel trends prior the shock, which we will see in the results section. The fact that TSP holders were inexistent prior the enactment of the resolution in January 2017, and that the vast majority of them were localized in certain provinces with other having no TSP beneficiaries after 2017, enables the study of a pure DiD strategy.

VI.1 Data

The ENAHO panel

The Peruvian National Household Survey (*ENAHO*), implemented by the *INEI* conforms the backbone of the data used in this study. The *ENAHO* dataset is a longitudinal survey on the labor outcomes and living conditions for the Peruvian residents, gathering data on socio-economic and individual characteristics. The panel structure of this dataset allows to track individuals over the course of the study, being crucial to address those individuals' labour market outcomes prior and post the treatment effect (the enactment of the TSP in 2017). In other words, the observational units change their treatment status between the two time periods of observation. Each individual is assigned a personal number (*numero*), that it keeps across the various rounds of the survey, allowing the traceability of every individual. Furthermore, every individual in the sample is matched with a geographical identifier (*ubigeo*), depicting where the individual is currently living. Matching individuals with their geographical area enables the construction of both the treatment and control groups at the provincial level. Precisely, the treatment group includes the provinces experiencing a noticeable number of TSP holders respect their total population after 2017. That includes the provinces of *Lima*, *Callao*, *Trujillo* and *Huaral*. On the other hand, the control group includes all the other regions with no or marginally presence of TSP holders. For this study I use yearly information from the *ENAHO* waves 2015 to 2019. The *ENAHO* panel is rotating, covering up until 5 years⁷. Normally a household entering the panel is followed between 2 and 5 years. The study has not suffered from changes in the definition of provinces over the time frame 2015-2019. Arguably, the provincial level is an appropriate aggregational level as departments⁸ are large administrative areas, and municipalities are too narrowly defined geographical areas given that individuals may commute within a larger geographical area.

⁷ The panel is intended to be a representative figure of the Peruvian population (Morales and Pierola, 2019).

⁸ Peru's administrative territory is divided into 26 departments. These departments are further sub-divided into 196 provinces and 1896 districts.

Sample Selection

The crude baseline selection consists of 470.431 observations, accounting for the 5 waves of the *ENAHO* panel. After reshaping the main dataset, excluding duplicates and unmatched individuals, lacking either the personal number (*numper*) or the geographical identifier (*ubigeo*) at some point, we are left with 394.722 observations as seen in the descriptive statistics (*Table II*), 84.01% of them belonging to the control group, whereas the remaining 15,99% account for the treatment group. In order to unfold the empirical strategy, I further curtail the sample by excluding individuals working in the public sector and in the armed forces as they are neither affected, at least directly, by the Venezuelan diaspora nor by the enactment of the TSP⁹. Individuals working in the public administration add up to 29,832 observations. As to gauge the impact within the working population, I drop from the main sample individuals aged above 65 years old, reducing the sample by 62,393 observational units. Therefore, the sample consists of individuals in their potentially working age, between 15 and 65 years old. Furthermore, for the sake of comparison between the treatment and control group I exclude those provinces consistently ranking as the most underdeveloped provinces in Peru. Considering that the treatment provinces stand out as the most developed regions, especially the provinces of Lima and Callao, such exclusion will ensure greater comparability. Those economically backward provinces, with above average unemployment levels and significantly lower wages are: *Cajamarca, Ayabaca, Islay, Puno, Amazonas* which represent 13,316 observations.

Outcome variables of interest

In order to study the main impacts of the TSP in the Peruvian labor market, I analyse its effect on the main labour market variables, namely wages, hours worked and employment levels. Furthermore, considering the imperative role of the informal sector in developing economies and particularly in Peru, informality levels are also addressed.

First of all, monthly wages are constructed considering both incomes generated in the main occupation but also in the second occupation. Surveyed individuals are asked what their main source of income alongside any other secondary source of earnings is. The real wages are adjusted by the *Consumer Price Index*¹⁰ (*CPI*) in 2012 as to homogenise the salaries across the time period of interest.

⁹ Although having a working permit, Venezuelan individuals cannot work in the public administration.

¹⁰ To adjust the wages for inflation we use a base year (in this case 2012) using the Consumer Price Index from

INEI. In order to do so I proceeded as follows: $Wage_{i,t} = \frac{Wage_{i,t}}{CPI_{2012}} * 100$

Similarly, hours worked depict both hours worked in the main and secondary occupation. Given Peru's socio-economic characteristics and the high levels of informality, accounting for both wages and hours works in the secondary occupation is not trivial.

Both employment and informality levels are constructed as binary variables. Individuals are considered employed if they did report working hours in the previous week or if they have a working contract. Furthermore, an individual belongs to the informal sector if she/he directly reports to be employed in the informal sector in her/his main occupation.

Individual characteristics

In an attempt to control for various observable individual characteristics that may bias the estimates at the individual level I include as explanatory variables the following indicators: age, sex, marital status, educational level and an indicator denoting whether an individual lives in a rural area.

As to discern the main components of each variable, for certain variables, I constructed binary variables, taking the value of 1 if belonging to a certain group and 0 otherwise. The variable sex has the value of 1 if the individual is a male. I split up marital status into various categories. For the sake of simplicity, I showcase in the descriptive statistics (*Table II*) only the fraction of single and married individuals. Likewise, I create a dummy variable for each educational level, namely individuals with no basic education and individuals with completed primary, secondary and finally tertiary education. Furthermore, I create a dummy variable taking the value of 1 if an individual is residing in a rural rather than an urban area.

The Venezuelan and TSP share

There is, to this day no open-source data on the Venezuelan share at the province level. Therefore, I created such a share making use of a *Bartik Instrument*. Due to its relevance in the unfolding of the study, the construction of this share can be seen in the empirical specification section (*section VII.3*).

In order to construct the Venezuelan share at the province level I used the number of Venezuelans in a given province at the base year 2017. Moreover, the Venezuelan total stock in Peru in a given year is obtained from *Superintendencia Nacional de Migraciones* and the estimated annual population for the years 2015, 2016, 2018 & 2019 are retrieved from *INEI*, whereas 2017 data comes from Census data.

Finally, I gathered the number of TSP holders from the *Superintendencia Nacional de Migraciones* at the department level. Given the number of TSP holders at the provincial level in each of the years since its implementation (2017, 2018 & 2019) I predicted the share of TSP holders in each province based on the distribution of Venezuelans across the geographical landscape, in other words, using the Venezuelan share I have constructed.

VI.2 Descriptive statistics

Table II provides the descriptive statistics of the individuals conforming the observations in our sample, split up between both the control and the treatment group. At first glimpse, we can observe that the treatment and control group present some dissimilarities in terms of the sample size. The regional concentration of the treatment, not being a spread phenomenon across Peru's geographical landscape, makes the number of observations in the control group higher, as more provinces did not experience (at least significantly) the introduction of the TSP.

Moreover, the number of individuals residing in a rural area (roughly 2%) in the treatment group stands in stark contrast with the share of individuals residing in such area in the control group (41%). Regarding the educational level, clearly more individuals have some sort of education above the primary level in the treatment group, with higher levels of completed secondary and tertiary education. Generally, individuals in the control group can be contemplated as less-skilled workers. Interestingly, there are also perceptible differences in the labor market outcomes variables. Individuals are overrepresented in the informal sector in the control group (58%) whereas informality drops to 38% for the treatment group. The reported employment is also higher in the control group, probably due to the presence of informality, which may also explain the higher number of weekly hours worked in the control group. Finally, the wages in the treatment groups are reportedly higher being this difference significant.

These socio-economic differences between the two groups emerge from the fact that treated individuals reside in more developed, economically active urban areas. Particularly, most of the treatment group resides in Lima, which is the capital and the leading economic hotspot in Peru. Therefore, it is not surprising that wages are higher and that informality, albeit still significant, does not reach parity with the levels in the control group, which cluster less densely populated areas, more rural and with higher levels of economic integration and development. Basically, most of the regions in the control group are located in the “*Sierra*” and “*Selva*” inner areas, contrary to the coastal regions of the treatment group.

Although it is important to acknowledge such differences, they do not invalidate the methodology deployed in this study. Furthermore, most of the differences between the treatment and control group remain statistically insignificant. Introducing individual fixed-effects should minimize any individual level unobserved bias. As previously seen, the main concern of this study is to see parallel trends in the outcome variables of interest before the enactment of the policy. Absent the policy or shock control and treatment units might have different levels but their changes would evolve parallelly (Wooldridge, 2015). Therefore, the next section unveils the suitability of the DiD methodology by comparing those trends before (and after) 2017.

Table II: Descriptive statistics ENAHO panel Control and Treatment Group

	<u>Control</u>			<u>Treatment</u>			Diff
	obs	mean	s.d	obs	mean	s.d	
Age	331618	36.49	14.98	63104	37.09	14.63	0.597
Male	331618	0.49	0.50	63104	0.48	0.50	-0.005
Single	331618	0.35	0.48	63104	0.40	0.49	0.047
Married	331618	0.26	0.44	63104	0.25	0.43	-0.006
Rural	331618	0.41	0.49	63104	0.02	0.13	-0.387
<u>Education</u>							
No education	331618	0.17	0.38	63104	0.05	0.22	-0.156
Primary	331618	0.33	0.47	63104	0.20	0.40	-0.127
Secondary	331618	0.28	0.45	63104	0.39	0.49	0.105
Tertiary	331618	0.22	0.41	63104	0.35	0.48	0.132
<u>Labor market</u>							
Hours worked	210,662	44.84	19.78	41,020	45.93	18.31	-0,843
Income	213,662	10420.16	12988.03	41,864	17772.26	19930.29	73521,10**
Informal	331618	0.58	0.49	63104	0.38	0.49	0,198
Private	331618	0.93	0.26	63104	0.93	0.25	0,002
Employed	331618	0.72	0.45	63104	0.66	0.47	0,006

Notes: Private is the share of individuals working in the private rather than public sector. The last column (right hand side) presents the estimates of a treatment status on the variable of interest with clustered standard error at the provincial level. The level of significance is given by: *p < 0.10, **p < 0.05, *** p < 0.01

Finally, how do these descriptive statistics of the Peruvian population compare to the main characteristics of the Venezuelan population? As previously mentioned, Venezuelan migrants are overrepresented in the informal sector, especially if compared to informality levels in the Peruvian labor market. Not surprisingly, Venezuelans report higher weekly working hours than individuals surveyed in the *ENAHO* panel. Probably, higher levels of labour informality among Venezuelans, the lower wages in the informal sector and their situation of instability in the Peruvian territory, coupled with the dire need to provide for their families account for such contrasting differences in the labour market.

Moreover, the educational background of the Venezuelan population (see *Table I*) stands in stark contrast with the educational levels observed in the control group. Not only Venezuelans have barely reported education below the primary level, but they also have higher completion rates in both

secondary and tertiary education. Interestingly, the educational characteristics of the Venezuelan population resemble the educational levels of the treatment group, with roughly the same share of individuals with reported completed secondary or tertiary education. Clearly, the treatment group gathers some of the wealthiest and most developed Peruvian provinces. Therefore, the similarity of the Venezuelan cohort to these provinces strengthens the hypothesis that Venezuelan migrants, prior to moving, were relatively well-off in terms of their socio-economic characteristics.

VI.3 Empirical specification

In order to estimate the effect of the introduction of the TSP to undocumented Venezuelan migrants on the labor market outcomes of the individuals that live in the provinces of the treatment group, the DiD methodology is implemented. I address the impact making use of panel data for the time period 2015-2019, with 2017 marking the year in which the policy (or treatment) took place.

We depart from the following specification:

$$Y_{idt} = \alpha + \beta TSPshare_{dt} + \gamma X_{idt} + \pi_i + \theta_t + \mu_{idt} \quad (1)$$

Where Y_{idt} stands for either log of wages, log of hours worked weekly, employment or informality in a time period t , in a province d for an individual i . Whereas wages and hours worked are continuous variables, both employment and informality are binary dependent variables. On the one hand, employment takes the value of 1 if an individual reported working the past week and 0 otherwise. On the other hand, informality takes the value of 1 if an individual do not have a working contract and 0 otherwise. The main independent variable $TSPshare_{idt}$ gathers the share of TSP holders in each province belonging to the treatment group – provinces with marginal numbers of TSP holders would belong to the control group for the sake of the study. The coefficient β can be interpreted as the effect of the respective labor market outcome that results from the implementation of the TSP in a given province. The variable X_{idt} is a matrix of time-variant individual characteristics¹¹ as to control for the individual heterogeneity that could potentially bias estimates. The variables π_i and θ_t are individual and time fixed effects, respectively. Additionally, I use clustered standard errors at the provincial level to control for a potentially correlated error term (autocorrelation)¹². Clustered errors at the regional level are preferred in a DiD model if the number of geographical observations (clusters) is high¹³ (Angrist & Pischke 2009 p.239). This is the case here as the number of geographical observations adds up to 195

¹¹ The variable X_{idt} includes: age, sex, marital status, educational level, ethnicity and whether or not they reside in a rural or urban area.

¹² The tendency for one observation to be correlated with previous observations (Angrist and Pischke, 2009 p.236)

¹³ Arguably, the inconsistency derived from random shocks in DiD models is to have either multiple time periods, many regions or both (Angrist and Pischke, 2009 p.239)

provinces (clusters) A fixed effects specification is used to address the potential endogeneity problem arising from the correlation between the time-invariant unobserved characteristics (captured in the error term¹⁴) and the explanatory variables. Indeed, if the time-invariant component of the error term is correlated with the explanatory variables we will have biased estimates. Therefore, a fixed-effects model would be preferred over a random effect (RE) model. Conversely to FE, RE models assume that the time-invariant unobservable characteristics are not correlated with any of the explanatory variables (Wooldridge, 2015).

Additionally, to support the previous intuition I conducted the Hausman test for the null hypothesis that the time-invariant components in the error term are uncorrelated with the explanatory variables. Results suggest a rejection of the Ho hypothesis, thus the inclusion of FE is preferred.

Furthermore *equation (2)* explores the dynamic component, namely variation over the years before and after the treatment (2017). This specification enables us to explore both the parallel trends assumption, by comparing both the pre and post 2017 time periods and to see whether the impact on the outcome of interest grows bigger or vanishes over time. Therefore, following Deryugina, Kawano and Levitt (2018)¹⁵, *equation (2)* shows how to estimate this changing, dynamic component:

$$Y_{idt} = \sum_{\tau=2015, \tau \neq 2017}^{2019} \beta_{\theta} * 1(t = \tau) * Treat_d + \gamma X_{idt} + \pi_i + \theta_t + \mu_{idt} \quad (2)$$

Where β_{θ} is the coefficient of interest encapsulating the dynamic component of the regression, capturing the differences across time and individuals belonging to either the treatment or control group. The variable $Treat_d$ takes the value of 1 if the observation i belongs to the treatment group and 0 otherwise. The year 2017, in which the policy (TSP) was enacted is omitted from the regression as to avoid collinearity. As previously mentioned, we should obtain non-significant coefficients for the pre-treatment years (2015 & 2016).

The Venezuelan Share

Importantly, I address two main issues regarding the study of a regularization process of refugee or migrant populations in the host economy while constructing my data. On the one hand, the location of TSP holders may not be exogenous. In fact, we might expect close correlation between the number of Venezuelan migrants in a given province and the number of TSP holders. Hence, we might not disentangle the pure effect of the introduction of the TSP share as Peru was simultaneously experiencing a continuous inflow of Venezuelan migrants. There is a matter of concern that the enactment of the TSP

¹⁴ In a panel data regression, the error term has two components, one time invariant (α_i) and one time variant (ε_{it}). It can be read as follows: $\mu_{it} = \alpha_i + \varepsilon_{it}$.

¹⁵ The authors make use of this dynamic specification while drawing their DiD strategy as to analyse the economic impact of the Hurricane Katrina in 2005.

fostered larger waves of Venezuelan migrants settling within Peru's borders. On the other hand, these location decisions may be endogenous, as new inflows of immigrants will tend to deliberately settle in certain locations, due to for example family networks or better labour market expectations.

Furthermore, there is no available data for the Venezuelan share at the provincial level. This limitation has also been encountered by Morales and Pierola (2019)¹⁶ while addressing the labour market effects of the Venezuelan diaspora in Peru.

Therefore, I construct the Venezuelan share in each province, the geographical aggregation level of interest in this study, making use of a Bartik Instrument. The Bartik instrument makes use of previous settlements of migrants from a given country, as a predictor of the actual share of those immigrants, also considering the annual population in the region of interest and the yearly inflow of immigrants from a given country. This instrument has been used as to address the endogeneity of the migration locational decisions, interacting migrant inflows by country of origin with previous immigrant geographic distribution (Jaeger et al 2018).

Precisely, as to construct the predicted share for the various years I departed from the specification in Jaeger et al (2018)¹⁷, using the Venezuelan stock and share from the most recent year available (2017), last available source dated back to 2007. I built the following specification:

$$VenShare_{p,t} = \frac{VenBase}{VenTotal} \frac{VenStock_t}{ProvPop_{p,t}} \quad (3)$$

Where *VenBase* is the number of Venezuelans in a given province in 2017 (base year), *VenTotal* is the total number of Venezuelans in 2017. Moreover, *VenStock* is the yearly Venezuelan stock in Peru and *ProvPop* is the annual population in a given province. The intuition behind this estimation is that given a geographical distribution of Venezuelan migrants and a yearly stock of Venezuelans (including new inflows), we can predict, based on population estimates, the share of the Venezuelan population in each province and year for which we have no data.

¹⁶ Morales and Pierola (2019) undertook an analysis at the provincial level on the effects of the Venezuelan diaspora in Peru's labor market looking into employment, informality and earnings of Peruvian workers, making use of the Venezuelan share in a given province as their main explanatory variable of interest.

¹⁷ Following Jager et al (2018) the Bartik instrument can be defined as: $Y_{jt} = \sum \frac{M_{0jt}}{M_{0t}} \frac{\Delta_{0t}}{L_{jt-1}}$, where $\frac{M_{0jt}}{M_{0t}}$ is the share of immigrants from country of origin in location y at a base year. Δ_{0t} is the number of new arrivals at the national level and L_{jt-1} is the local population in the previous year.

VII. Results

VII.1 Parallel Trends

So far, we have observed that our treatment and control group differ in some of their characteristics. In an ideal set up carried out in a laboratory, we would attempt to have exactly the same control and treatment group. However, natural experiments are given, and although offering scholars with the opportunity to study trends before and after a shock, the groups used for the analysis may differ systematically (Angrist and Pischke, 2009). Therefore, as previously mentioned I resort to the assumption of parallel trends between the control and treatment group before the shock as to underpin the empirical DiD strategy.

As a brief reminder, parallel trends follow the assumption that outcomes in the treatment and control groups before the treatment moved in parallel, following the same pattern or evolution over time (Schwerdt and Woessmann, 2020). Departing from *equation (2)*, depicted in *Table III*, upper part of *panel A*, the null hypothesis of the same trend in the outcome of interest (be it wages, hours worked and informality) cannot be rejected. Following the parallel trends assumption, the coefficients for the logarithm of wages, hours worked and informality in the labor market do not show any significant results in either 2015 or 2016, prior the enactment of the TSP in 2017. This lack of significance supports the assumption that the trends in these outcome variables of interest were aligned before the actual shock took place. The hypothesis is further tested and supported through the implementation of robustness checks in section *V.II.4*.

Nevertheless, the results for employment do not provide evidence for the assumption of parallel trends before the treatment effect. Results showcase a negative and statistically significant association before the treatment. Even though that may be troubling, an exploration of the Peruvian labor market sheds further light on this circumstance. The Peruvian economy, albeit relatively diversified (World Bank 2020), still relies on the oil and gas industry in some regions, mainly extractive. In 2015 the sector experienced a drop in its growth of 11,5% (Cuba, 2015) which dragged down employment¹⁸ levels in provinces where the industry is especially relevant, namely *Lima*, *Callao*, *Arequipa* or *Talara*. Precisely, the provinces of *Lima* and *Callao* conform the treatment group, therefore affecting the trends prior 2017. Nevertheless, the effect on employment levels completely vanished by 2018 (see *Table III*) as no other impacts on the oil industry took place.

¹⁸ The oil production plummeted 16,3% due to a drop in the oil prices that the industry in Peru circumvented lowering the offer (Cuba, 2015).

VII.2 The Impact of the TSP on the Peruvian Labor market

Having briefly explored the labour market behaviour before the introduction of the TSP, concluding that trends were stable before 2017 except for overall employment levels, now we turn to the main benchmark results from *equation (2)*. Baseline results (*Table III*) shed light on effects (if any) of the TSP on the labour market outcomes of the treatment group in comparison with the control group.

Each specification regressing one of the four outcomes of interest makes use of (unobserved) time invariant fixed effects. Furthermore, the second column for each outcome variable adds (observed) time-varying individual controls (X_{idt}). Results across the first and second column for every specification show essentially the same results with minimal differences in some of the coefficients. Therefore, most of the heterogeneity or variation at the individual level is explained through individual unobserved characteristics captured through the fixed effects. Nevertheless, standard errors are lower for the specification with individual controls, especially in *panel B*, obtaining a more accurate mean of the sample¹⁹.

An interesting picture emerges while looking into the post treatment period (2018 & 2019) in *Table III*. First of all, wages and informality show a negative and statistically significant coefficient, whose magnitude and significance increase over time. Apparently, the introduction of the TSP had a negative impact on both wages and the probability of being employed in the informal sector in the treatment provinces, in line with *hypothesis (2)*. As per wages, we are witnessing the expected sign given that hours worked remain unaffected. Therefore, the impact of increasing the labor supply was channelled through wages. Furthermore, the results depict a non-significant relationship between the treatment group after 2017 and the probability of being employed. This finding is consistent with the view that in the absence of unemployment benefits, employment is relatively unresponsive to negative shocks. Even if wages fall, people cannot afford being unemployed.

The extent of the impact on wages can be described as follows. First of all, after the implementation of the TSP, individuals in the treatment group experienced a 4.3%²⁰ decline on wages in 2018 relative to individuals in the control group. The magnitude of the shock increased in 2019 with now a 6.2% decline in wages in the treatment respective the control group. Both results are statistically significant at the 0.05 significance level. Regarding informality levels, after the enactment of the TSP, individuals in the treatment provinces are 1.2%²¹ percentage point less likely to be employed in the informal sector in 2018, with the probability further decreasing in 2019 up to now 2.2%. Not only the magnitude increases but also the level of significance, with the results being significant at a 0.1 significance level in 2018

¹⁹ When the standard error increases, the means are more spread out. Therefore, it would be an inaccurate representation of the true population mean.

²⁰ The interpretation of a log-linear coefficient is: $100 * (e^{coefficient} - 1)$ in this case $100 * (e^{-0.044} - 1)$

²¹ The interpretation of a linear probability model is: $100 * coefficient$, in this case $100 * 0.012$

and at the 0.01 significance level 2019, consolidating the pattern started in 2018. Finally, both hours worked, and overall employment levels show a statistically insignificant, albeit negative coefficient in the treatment group after 2017.

Table III: The impact of the TSP on the Peruvian labor market on wages, informality hours worked and employment levels (2015-2019)

	Log of Wages		Informal job		Log of Hours		Employment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A</i>								
Treat*2015	-0.038 (0.026)	-0.040 (0.026)	-0.001 (0.009)	0.000 (0.010)	-0.012 (0.028)	-0.014 (0.027)	-0.020*** (0.007)	-0.020*** (0.006)
Treat*2016	0.022 (0.024)	0.022 (0.023)	-0.011 (0.008)	-0.011 (0.008)	0.017 (0.011)	0.017 (0.011)	-0.013* (0.007)	-0.013** (0.007)
Treat*2018	-0.044** (0.019)	-0.046** (0.018)	-0.012* (0.007)	-0.013* (0.007)	-0.004 (0.018)	-0.004 (0.019)	-0.000 (0.013)	-0.000 (0.013)
Treat*2019	-0.064*** (0.025)	-0.064** (0.025)	-0.022*** (0.007)	-0.022*** (0.007)	-0.019 (0.010)	-0.019 (0.016)	-0.005 (0.012)	-0.002 (0.015)
<i>Panel B</i>								
TSP share	-0.027*** (0.785)	-0.028*** (0.005)	-0.093*** (0.192)	-0.035*** (0.002)	-0.007 (0.004)	0.007 (0.005)	-0.028*** (0.192)	0.005*** (0.002)
Individual controls	Yes	No	Yes	No	Yes	No	Yes	No
Observations	218906		366033		275600		366033	
R ²	0.008		0.000		0.003		0.002	

Results from the benchmark specification, panel A depicts estimates from *equation (2)*, whereas panel B depicts the results from *equation (1)*. Standard errors (in parenthesis) clustered at the provincial level. All specifications include year and individual fixed effects. Moreover, the first column of each outcome variable also includes observed individual controls: age, sex, rural and education. Individuals working in the public sector or in the military are excluded. Significance levels are given by: * p<0.10, ** p<0.05, *** p<0.01

Furthermore, departing from *equation (1)*, *panel B* shows the aggregated estimates of the impact of the TSP on each variable of interest making use of the TSP share (share of TSP holders in each province). Overall, one percentage point increase in the TSP share is associated with a 2,6% decrease in wages. Furthermore, the same increase is associated with 8,9% decrease in the probability of being employed in the informal sector.

VII.3 Results by educational-level

As previously seen, scholars addressing migration effects in the host economy often emphasise its impacts across the skill or education distribution. In fact, Card's (1990) seminal and subsequent work (Card, 2001) on the impact of the Cuban migrants in Miami's labour market has focused on the skill dimension of the migratory effect. Moreover, Borjas (2003) was an emphatic proponent of assessing the impact of migration across the skill distribution, coming up with the well-known skill-cell approach (see *section IV*). The main reasoning behind it is that the education or skill-distribution of the newly arrived immigrants will be crucial to determine which groups will be mostly affected by the shock. Both the characteristics of the migrant and the native population will determine whether we will witness synergies in the job market or competing dynamics leading to frictions in the labour market outcomes. In a similar fashion, we may expect the enactment of a policy granting labour market access to previous migrant cohorts to change the nature of the impact across the skill distribution (Bahar et al 2021).

Following the intuition that the enactment of the TSP may have contrasting effects across the educational distribution, here I replicate the benchmark specification drawn in *equation (1)* by educational level, by splitting the sample into individuals belonging to the different educational level in each case. Through *equation (1)* we will exploit the effects at the aggregate level making use of the TSP share. *Table IV* depicts the results through the educational level distribution.

Table IV: TSP effect across skill levels on wages hours worked, informality and employment levels (2015-2019)

	Log of Wages (1)	Informal job (2)	Log of Hours (3)	Employment (4)
No Education	-0.016 (0.050)	-0.045*** (0.090)	-0.028*** (0.141)	-0.028*** (0.006)
Primary	-0.038*** (0.016)	-0.033** (0.004)	-0.006 (0.014)	-0.028*** (0.548)
Secondary	-0.043*** (0.013)	-0.033* (0.003)	-0.007 (0.011)	0.006** (0.305)
Tertiary	-0.011 (0.012)	-0.042*** (0.034)	-0.001 (0.009)	-0.004 (0.003)
Individual controls	Yes	Yes	Yes	Yes

All educational outcomes refer to a completed educational level and enter as the dependent variable of the model following *equation (1)*. Standard errors (in parenthesis) clustered at the provincial level. All specifications include year and individual fixed effects. Moreover, the specification also includes observed individual controls: age, sex, rural, ethnicity and education. Standard errors clustered at the provincial level. Significance levels are given by: * p<0.10, ** p<0.05, *** p<0.01

First of all, there seems to be a discernible effect of the TSP on wages for both individuals with completed primary or secondary education. Precisely, a one percentage point increase in the TSP share decreases wages for those groups by 3.8 and 4.3% respectively. The same increase is also associated with a drop in the probability of an individual to work in the informal sector across all skill levels. For one percentage point increase in the TSP share individuals experience a drop of 4,5% for not educated, 3.3 for primary, 3.3% for secondary and 4.2 % for tertiary educated workers in their probability of being employed in the informal sector. Individuals with no reported completed education also experience a drop in their reported amount of hours worked by 2.8% for every percentage point increase in the TSP share and also in their probability of being employed in the formal sector. The effect on employment levels seems to gradually fade away as the coefficient for individuals with completed tertiary education is not statistically significant. The TSP has a marginal effect on the employability of individuals with completed secondary education although the effect increases for primary education. Individuals with completed primary level experience a 2.8% drop in their probability of being employed.

Overall, individuals with low reported education (no education & primary) experience the most pronounced negative effect of the TSP enactment on their respective labour market outcomes. Considering the high rates of informality across the different educational groups in the sample (see *Table A.II*, appendix), the impact on informality is not unanticipated. Nevertheless, a drop in the probability of being employed in the informal sector does not necessarily mean a bad outcome, since individuals may be moving into the formal economy. However, estimates for the probability of being employed are also decreasing. The non-significant effect of the wage coefficient for non-educated workers may be surprising, given that they seem to be working less hours, and experienced lower probabilities of being employed either in the formal or informal economy. However, one should be cautious on those interpretations as the traceability of workers at the bottom-end of the skill distribution is sometimes inaccurate. In fact, I have encountered lower response rates in the *ENAH*O panel among workers reporting lower educational levels.

VII.4 Robustness checks

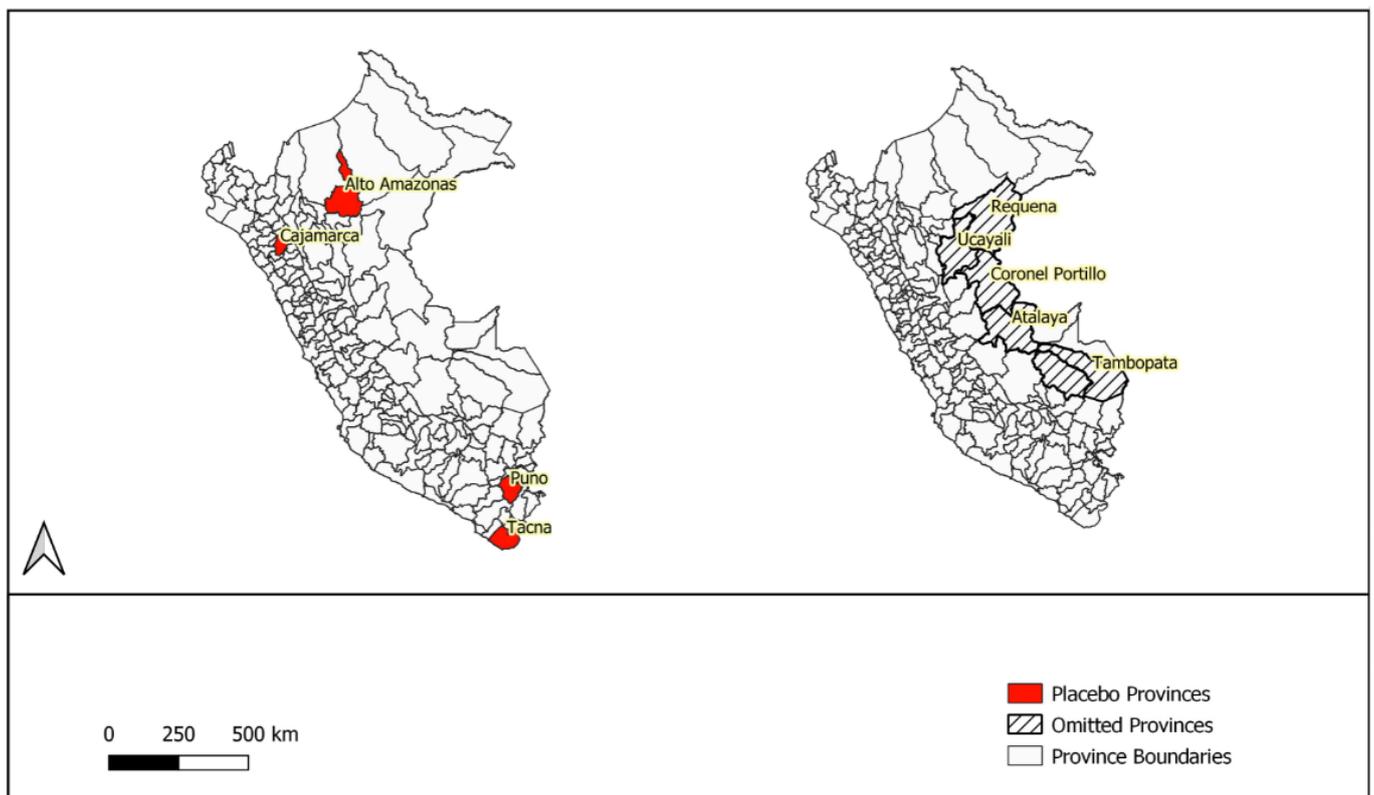
The possibility that the decline in some labor market indicators in the post treatment period occurred through macroeconomic shocks other than the Venezuelan component must be considered. Moreover, I further test the sensitivity of my analysis by reformulating my control group. *Figure III* maps both the placebo and the omitted groups analysed in this section.

In order to test for the validity of the post treatment period, where we witnessed a changing pattern in various outcomes of interest, becoming significant after the shock, I make use of a placebo test, a method used in akin studies (Balkar & Tumen, 2016; Akgündüz, Van den Berg, Hassink, 2015) by changing the treatment group with provinces not affected by the shock (belonging to the control group in the benchmark specification). Therefore, I estimate the labor market impact on individuals of four

randomly chosen provinces (*Cajamarca, Puno, Tacna* and *Amazonas*) as if they had been strongly affected by the migratory shock through the introduction of the TSP. As seen in *Table IV*, neither wages, hours worked or the probability of being in the informal sector show any significant effect after the enactment of the TSP in 2017. Therefore, I am able to conclude that the event that altered the various trends in the labor market most certainly was the Venezuelan component. Prior 2017, the impact of the placebo treatment also appears insignificant.

Additionally, my results are robust across different specifications of my control group. In *Table V*, provinces located at the *Selva* region²² are dropped from the control group. These regions, are geographically distant to the treatment provinces (see *Figure III*), mainly located on coastal areas and they also differ in their economic development levels, being relatively backward if compared to central and coastal provinces. Therefore, it could be argued that Selva provinces are too different in terms of economic progress as to be a suitable comparison group. As seen in *Table V*, there is a statistically significant effect for wages and informality levels after the shock, in line with the benchmark specification, whereas the parallel trend assumption still holds.

Figure III: Peru. Placebo treatment and Omitted Selva provinces used in the robustness specification



Author’s own illustration based on GIS data. Placebo provinces are represented on the right-hand side. Omitted Selva provinces are mapped on the left-hand side.

²² Atalaya, Coronel Portillo, Manu, Tambopata, Ucayali, Requena

Both the *placebo* and the *omitted provinces* test support the validity of the methodology and the benchmark specification. Undoubtedly, as seen through the main specification and placebo test, after 2017, a shock of exogenous nature affected some of the main labor market outcomes in Peru, deviating from the pre-treatment period. Across the baseline results and sensitivity tests I do not see a significant effect on the outcome variables of wages, informality and income. Employment remains the outlier in this analysis as the significance in the pre-treatment period does not vanish regardless of the control group used in the analysis. Probably, the fact that the oil industry is mainly geographically concentrated in some provinces belonging to the treatment group (*Lima*) makes the coefficient significant prior to 2017 due to a drop in the industry's output in 2015. Interestingly, when changing the treatment group in the placebo test, we observe a loss of significance in employment for the pre-treatment period, vanishing by 2016. The still significant result at the 0.10 percent level may still be driven by some plants located in some of the control groups and the ripple effects of the industry shock in other provinces.

Table V: Robustness checks using a Placebo group as the new treatment and Omitting Selva provinces

Outcome (year)	Placebo		Omitting Selva	
	Coeff	sd	Coeff	sd
<u>Income (log)</u>				
2015	-0.174	0.026	-0.022	0.253
2016	-0.001	0.743	0.032	0.023
2018	0.047	0.064	-0.038**	0.019
2019	0.041	0.089	-0.060**	0.026
Observations	225774		285040	
R^2	0.01		0.003	
<u>Hours worked</u>				
2015	-0.334	0.054	-0.008	0.700
2016	0.089**	0.036	0.018	0.105
2018	-0.001	0.982	-0.005	0.791
2019	-0.043	0.267	-0.022	0.186
Observations	285040		262192	
R^2	0.003		0.003	
<u>Informality</u>				
2016	0.002	0.874	0.001	0.009
2017	0.014	0.105	-0.012	0.008
2018	-0.000	0.992	-0.012	0.074
2019	0.008	0.692	-0.020**	0.007
Observations	378206		348173	
R^2	0.000		0.006	
<u>Employed</u>				
2015	0.236	0.016	-0.018**	0.006
2016	0.024*	0.083	-0.014**	0.007
2018	0.003	0.020	0.000	0.013
2019	0.341*	0.028	-0.003	0.010
Observations	378206		348173	
R^2	0.002		0.017	

The table depicts the results from the benchmark specification emanating from *equation (2)*. In the first two columns the treatment group is replaced, including the provinces of Cajamarca, Puno, Tacna and Amazonas instead. In the last two columns the provinces belonging to the Selva regions are dropped from the sample. Standard errors (in parenthesis) clustered at the provincial level. All specifications include year and individual fixed effects. Individual controls: age, sex, rural and education. Individuals working in the public sector or in the military are excluded. Significance levels are given by: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

VII.5 Inclusion of the Venezuelan Share

So far, I have tested the hypothesis that the enactment of the TSP could have had an impact on the labor market outcomes of the Peruvian workers. After a large migratory inflow, considering the relevance of the informal sector in Peru, we should see migrants largely settling in the informal sector, due to both the well-known process of skill downgrading and the aversion of local labor markets to hire migrant workers upon arrival. However, the enactment of such working permit to relatively well-educated migrants could have pushed them into the formal rather than informal sector, changing their distribution across the Peruvian labor market.

Undoubtedly, the enactment of the TSP altered some of the economic indicators in the Peruvian labor market. Arguably, the TSP influences the labour market through two channels. On the one hand, TSP holders are granted the legal right to work and to sign contracts, therefore being able to compete in the formal economy. On the other hand, the TSP might have propelled larger waves of Venezuelan immigrants by improving the legal situation of Venezuelans migrants, therefore increasing their expected returns on the Peruvian soil.

The analysis of the effect of such a policy is to some extent hampered by the overlapping effect of the migratory flow per se, taking place simultaneously. In fact, Bahar et al (2021) while addressing the effect of the *PEP program*²³ also mention the possibility that this continuous migration effect tops the direct effect of the policy. Therefore, this section aims to provide some suggestive evidence on these effects. In *Table VI* I test for these channels. Precisely, the Venezuelan share enters as an additional variable in *equation (2)* depicting the DiD specification showcased in *panel A*. Furthermore, as to isolate the effect of the Venezuelan share I regress *equation (1)* making use of this share rather than the TSP share.

The Venezuelan share is constructed through the aforementioned Bartik instrument. Arguably, the nature of the instrument already controls for the endogeneity effect that may arise in the fixed effect specification (1), as Venezuelan migrants may self-select into regions with growing number of Venezuelans. However, the instrument includes a static component, namely the Venezuelan share in a baseline year (2017) before the actual large inflow took place. In other words, the Venezuelan share de facto includes lagged past Venezuelan settlements, a well-known resource as to control for the endogeneity problem in the literature assessing the immigrant impact in the host labor market (Goldsmith-Pinkham, 2020).

²³ In a similar fashion, the PEP (Permiso Especial Permanencia) program granted Venezuelan workers in Colombia the legal right to work and access educational and health services.

Table VI: Inclusion of the Venezuelan Share in the benchmark specification

	Log of wages	Informal job	Log of Hours	Employment
	(1)	(2)	(3)	(4)
<i>Panel A</i>				
Treat*2015	-0.049 (0.033)	-0.005 (0.011)	-0.010 (0.045)	-0.014 (0.014)
Treat*2016	0.014 (0.029)	-0.016 (0.012)	0.021 (0.027)	-0.008 (0.015)
Treat*2018	-0.026 (0.042)	-0.002 (0.022)	-0.014 (0.067)	-0.012 (0.037)
Treat*2019	-0.034 (0.065)	-0.004 (0.031)	-0.033 (0.091)	-0.019 (0.053)
<i>Panel B</i>				
VenShare	-0.013*** (0.004)	-0.018*** (0.003)	0.003 (0.001)	-0.029*** (0.005)
Observations	218874	365372	275567	365372
R ²	0.009	0.001	0.004	0.002

Results from the benchmark specification including the Venezuelan share. Panel A depicts estimates from *equation (2)*, including the Venezuelan Share as a control, whereas panel B depicts the results from *equation (1)* substituting the TSP share for the Venezuelan share as the main dependent variable. Standard errors (in parenthesis) clustered at the provincial level. All specifications include year and individual fixed effects. Moreover, each outcome variable also includes observed individual controls: age, sex, rural, ethnicity and education. The economically poor & backward provinces, relative to the national average, of Cajamarca, Ayabaca, Islay, Puno, Amazonas are dropped from the sample to avoid any bias. Individuals working in the public sector or in the military are excluded. Significance levels are given by: * p<0.10, ** p<0.05, *** p<0.01

The results from the benchmark DiD specification after the inclusion of the Venezuelan share (panel A) do not depict any statistically significant coefficient in the post-treatment period. The inclusion of the Venezuelan share at the provincial level absorbs any direct effect of the TSP program. Furthermore, in *panel B* I tested the aggregate effect of the Venezuelan share on Peru's labor market. Similarly, the Venezuelan share mainly includes the provinces that display a significant amount of TSP holders relative to their population size. As seen in *Figure I*, the number of Venezuelans as a share of the Peruvian population exponentially increased at the onset of the treatment period in January 2017.

The results depict a negative and statistically significant (at the 0.01 significance level) impact of the Venezuelan share on the wages of the Peruvian workers. For every one percent point increase in the Venezuelan share, Peruvians experience a 1.3% drop in their wages. Furthermore, the probability of being employed in the informal sector decreases by 1.8% for every percentage point increase in the

share, whereas the overall drop in the probability of being employed goes to 2,9%. Lastly, there is no significant impact of the Venezuelan migration after 2017 on the number of hours worked

VIII. Discussion of the results

Unequivocally, the Peruvian labor market reacted to the introduction of the TSP, as seen especially in wages, informality levels and overall employment levels. Precisely the DiD methodology identifies such a changing pattern in the Peruvian labor market after 2017, coinciding with the introduction of the TSP. The DiD strategy identifies that not only wages but also the probability of being employed in the informal sector dropped in the aftermath of the introduction of the TSP. Most of the competition from the Venezuelan shock took place at the lower end of the income distribution and especially in the informal sector. Given the relative size of the Peruvian informal sector, and the short-time horizon of the study, Venezuelans accommodate in jobs that they could “easily” get upon arrival.

From the theoretical framework previously derived, any migratory impact may have an effect either on the geographical landscape (Altonji and Card 1991), skill distribution (Borjas 2003) or both (Card, 2001). On the one hand, the DiD strategy englobes the spatial approach as it does assess the geographical impact of the policy or shock in the affected provinces conforming the treatment group, using the regions not affected by such policy as a counterfactual. The results from *Table III* depict that the inhabitants of those provinces experience declining wages alongside decreases in their probability of being employed in the informal sector.

Furthermore, in *Table V* results from *equation (1)* are split between education levels in order to further approximate the skill-cell approach. The results show that in fact the effect was vividly present among low-educated workers, with the effects vanishing as educational attainment increased. In fact, there are almost no effects for high-educated workers. Across all the educational levels, a one percentage point increase in the share of TSP holders decreased the probability of having an informal job. The negative effect on wages suggest that a large number of workers with primary and secondary education are also employed in the informal economy, either as their main or secondary occupation. In fact, results from *Table A.II* (appendix) depict an overrepresentation of individuals, regardless of their educational level, in the informal sector. Particularly high is the share of individuals with no reported education present in the informal sector (79,94%). Furthermore, above 60% of individuals with primary education are settled in the informal economy whereas more than half of individuals with secondary education are also in the informal sector. This large, negative penalty for workers without higher education proves the lack of complementarity in the informal sector between Peruvian residents and Venezuelan individuals. However, it is debatable what the effect would be in the formal economy, given an increased participation of Venezuelan individuals in the formal sector. Arguably, there are larger

expected gains through job complementarities in more productive sectors, which are found in the formal rather than in the informal economy (Amin, Ohnsorge and Okou, 2019)

Although the DiD methodology identified a changing pattern in the Peruvian labor market, with the effect of the TSP rippling through the Peruvian labor market, what was left to see was whether the TSP affected directly or indirectly the labor market. Hence, one fundamental concern while assessing the role of the TSP was the overlapping effect of the continuous inflow of Venezuelan migrants during the treatment period (after 2017). Certainly, results from *Table VI* dissipate any sort of doubt. The main driver of the shock in the Peruvian labor market was the amount of Venezuelans (Venezuelan share) clustering in certain geographical areas, mainly *Lima*, *Callao* and nearby provinces. When controlling for the Venezuelan share in each province, the significance level of the policy in the treatment group vanishes (*Table VI*). The TSP potentially acted as a call factor, propelling larger waves of Venezuelan migrants entering the Peruvian territory. Considering the lack of social protection in Venezuela's neighbouring economies back in 2017, the enactment of such regulatory permit increased the expected returns of migration in Peru, altering refugee flows. Not only did the TSP provide the opportunity for Venezuelan migrants to opt for a legal working contract, but also the opportunity to access health and education services, thus increasing the expected returns of migrating to Peru.

Following the neoclassical model (Harris and Todaro 1970; Piore, 1979), simply an inflow of migrants would put pressure on salaries and employment levels, which is allegedly what occurred in Peru after 2017. The extent of the impact, either on wages or employment will rely on workers' responsiveness to wage changes (Borjas 1995). Nevertheless, I found that the impact is somehow distributed between wages and employment levels. Peruvian individuals are not entirely responsive nor unresponsive to wage differentials, with the effect on labour supply spreading out across both wages and employability.

Overall, the enactment of the TSP did not change the allocational patterns of the Venezuelan population who still compete in the bottom of the income and skill-distribution. At least in the short term, the main effect of the TSP was not direct, lifting competition from the informal to the formal economy but through prompting more Venezuelans into Peru. Probably, the low validation of the educational and other certificates are still the main burden Venezuelan migrants face to climb up the occupational ladder. Although immigrants were granted a working permit, their certificates and academic transcripts were still pending validation (99.5%) which may be a more plausible explanation to the lack of penetration into high-skill occupations and the non-significant impact on the labor market impacts for tertiary educated workers. The ongoing struggle in order to obtain educational and professional recognition is paired with increasing discrimination towards Venezuelan migrants. The discrimination against them is acutely present, with 42% of them having reported some sort of discrimination or abuse during their stay in Peru. Strikingly, half of this reported discrimination is taking place at the working place (*ENPOVE*, 2018). Therefore, Venezuelan immigrants, regardless of being holders of a TSP permit are

pushed into occupations that do not suit their genuine set of skills, what is known as the skill-downgrading effect upon arrival. In the long-term, granted with the right social-protection, we might expect Venezuelan migrants to better integrate in the Peruvian labor market, opting to better jobs as they assimilate in the host country.

In a nutshell, despite the fact that the TSP provided a legal working framework, my findings suggest that this did not improve Venezuelans' situation in Peru. It is still unclear how the introduction of the TSP could have overcome the main burdens Venezuelans faced upon arrival in Peru. On the one hand, a lack of knowledge of the Peruvian labour market and the lack of connections in the formal economy paired with soaring discrimination still leaves Venezuelan individuals in a vulnerable situation. Furthermore, employers' reluctance to hire Venezuelan workers might not simply dissipate with a working permit. In the absence of proper incentives, employers might still prefer to hire native individuals over immigrants. Furthermore, the short-term time-span of the TSP does not provide sufficient evidence on the mid- and long-term effects of such policy in the local labor market.

IX. Conclusion

Although emerging, there is to this day still scarce literature addressing the impact of refugee flows between developing economies. Such refugee shocks provide researchers with the opportunity to delve into the impacts of sudden and large migration inflows on the host labour markets. The unexpected nature and geographical concentration of such migration episodes often serves as a natural experiment. Arguably, granting labour market access to refugees will improve their integration in the host economy. Refugees will now be able to compete in the formal economy, in occupations that better suit their true set of abilities. Nevertheless, the incorporation of these individuals in the formal economy will have detrimental or complementary effects on the host population. That will largely depend on the intrinsic skill characteristics of both the refugee and resident population and the labour market structure of the host economy.

The enactment of the TSP in Peru grants the opportunity to study the introduction of such policy in the developing-developing country setting (Peru -Venezuela), exploring the effects of a refugee exposure in the local labour market. In fact, due to its relatively new introduction, this study sheds light for the first time on the impacts of the TSP permit on the Peruvian labor market.

Overall, the analysis suggests that the enactment of the TSP had a strong effect on both wages and the probability of being employed in the informal sector. We would have expected the effect of such policy to increase competition in the formal rather than the informal sector. Considering an expected wage premium in the formal sector, undocumented migrants will perceive larger gains from settling in the formal economy. However, a closer look into Peru's socio-economic landscape unveils the many

burdens workers face to settle in the formal economy. Hence, an impact on the informal sector emerges as a more plausible scenario.

Indeed, estimates depict a localized effect in the informal sector. The probability for Peruvian workers to work in the informal sector drops, through an increased competition in the sector. The extent of the impact can be seen in wages and employability across the bottom end of the education-distribution even affecting individuals with completed secondary education.

This study further shows that the effect took place through an increased presence of Venezuelans in Peru. However, it is hard to disentangle to what extent the introduction of the TSP diverted migratory flows across neighbouring economies. Although beyond the intrinsic scope of this work, assessing how the enactment of regulatory permits may affect migratory patterns will be a crucial work within the forced displacement argument. Not only accounting from such diversion would make estimates of the actual impact on the local labor markets more accurate but will certainly help anticipate migratory patterns in the event of a refugee crisis. Furthermore, albeit early studies suggest that simply granting working permits to refugees is far from being the answer local labor markets need, there is still lack of evidence on how these policies would affect labor market outcomes in the mid and long term. The response may change over time as the effects of the regulatory permit consolidate in the labor market. Unfortunately, Peru receded its vow towards a better inclusion of Venezuelan migrants within its borders, with the inclusion of Visa requirements starting in 2019 and not further renewing the TSP. Albeit faulty, the enactment of the TSP seemed a stepping- stone toward building a better, welcoming framework to displaced Venezuelans and undoubtedly a step forward towards refugee rights in South America.

Not only did the policy demonstrate to be insufficient as to both integrate and accommodate Venezuelans in Peru. It also did not tackle the main formal employability issues faced by Venezuelans, namely their poor certification validation rates and the lack of incentives to employers to hire them with legal and binding working permits. Therefore, any regularization process has to be accompanied by cross-country cooperation in terms of educational and labour experience recognition, which, coupled with increased incentives for employers to higher vulnerable migrants with a legal contract would increase migrant's labor market gains. However, it is left to see to what extent better employability of migrants in the formal economy would benefit or harm natives' labor market outcomes. The vast literature assessing such impacts in the labour markets differ, placing much of the effect on the complementarity of the skill set of both natives and migrants.

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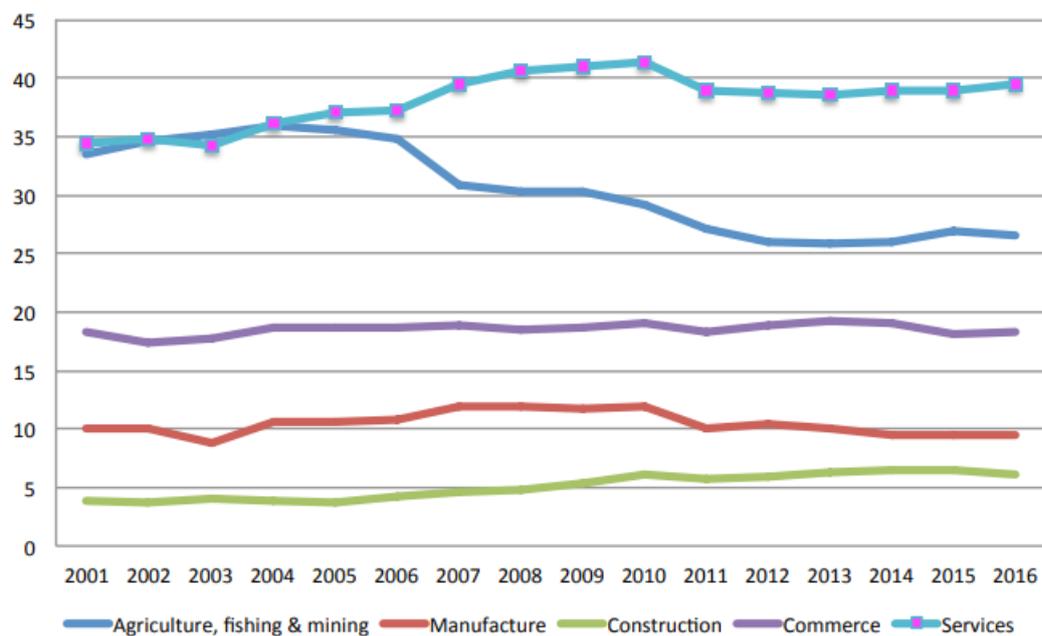
Appendix

Figure A.I: Peru's Real GDP per Capita 1951 – 2016

Years	Percentage Average Growth
1951 – 1960	2.8
1961 – 1970	2.3
1971 – 1980	0.9
1981 – 1990	-3.2
1991 – 2000	2.1
2001 – 2010	4.3
2011 – 2016	3.5

Source: Banco Central de Reserva del Peru, 2016. Graph from: Berrios (2018)

Figure A.II. Peru: Distribution of Employment, 2001 – 2016 (In percent of total Employment)



Source: INEI (2017). Graph from: Pastor and Meoño (2019)

Table A.II: Employment and Informality across different educational levels in the ENAHO sample

Education	Observations	Employed	Informality
No education	62,267	79,05%	77,94%
Primary	126,495	66,26%	61,45%
Secondary	120,704	70,64%	56,39%
Tertiary	97,883	71,06%	31,94%

Author's own illustration based on the ENAHO sample (2015-2019)