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Migration and crisis: the effects of Covid-19 pandemic on migrant workers in Brazil

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Abstract: *This study examines to what extent international migrants were affected by the Covid-19 pandemic, focusing on the formal labor market in Brazil. The investigation is framed by a quantitative methodological framework based on Brazilian administrative data to identify hirings and dismissals of migrant workers. In dialogue with the literature on migration and crisis, the hypothesis of the study was that migrant populations would lose more jobs due to the pandemic and would be more affected than nationals. In contrast, the data show that the sectoral and occupational allocation of migrants newly settled in Brazil resulted in them having a positive employment balance, even compared to native workers. In addition, we found that the impact of the pandemic was uneven across different groups of migrants, and it depends on economic activity sectors and occupations. This research demystifies the idea that migrants are the first affected by the economic crises. The article brings theoretical contributions from the perspective of south-south migrations.*

Keywords: Covid-19 pandemic. Labor market. Migration. Brazil.

Migração e crise: os efeitos da pandemia de Covid-19 nos trabalhadores migrantes no Brasil

Resumo: Este estudo examina em que medida os migrantes internacionais foram afetados pela pandemia da Covid-19, centrando-se no mercado de trabalho formal no Brasil. O arcabouço metodológico da pesquisa foi baseado em dados quantitativos referente aos registros administrativos do país para identificar admissões e demissões de trabalhadores migrantes. Em diálogo com

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a literatura sobre migração e crise, a hipótese do estudo era de que as populações migrantes seriam mais afetadas com a perda de emprego pela pandemia. Discrepantes, os dados demonstram que a alocação setorial e ocupacional dos migrantes recém-instalados no Brasil fez com que esses tivessem um saldo empregatício positivo, mesmo em comparação com os trabalhadores nativos. Além disso, verificamos que o impacto da pandemia foi desigual entre os diferentes grupos de migrantes e dependendo dos setores de atividade econômica e das profissões. Esta investigação desmistifica a ideia de que os migrantes são os primeiros afetados pelas crises econômicas.

Palavras-chave: Pandemia de Covid-19. Mercado de trabalho. Migração. Brasil.

Introduction

The literature on migration and crisis, in general, has shown that migrant and refugee workers can be particularly vulnerable to large economic crises. Christian Dustmann, Albrecht Glitz, and Thorsten Vogel (2010), in a study about migrants from Organization for Economic Co-operation and Development (OECD) and non-OECD countries to Germany and the United Kingdom (UK), found they are more likely to lose their jobs compared to the native population, even after controlling for age, education, and location. Nevertheless, economic crises can have heterogeneous effects on migrant workers, depending on particular features of their integration in the labor market in the host country. For example, Blake Sisk and Katharine Donato (2018), studying employment transitions of native and foreign-born populations in the United States (US), found that low-skilled workers tend to have more long-lasting transitions to part-time jobs compared to high-skilled ones.

Moreover, according to Philip Martin (2009), to understand the impact of economic crises on migrant workers, it is relevant to look at which sectors they are employed in, as it can lead to highly heterogeneous responses to a crisis. In this sense, Chris Tilly (2011) states that it is not entirely clear whether migrant workers will be more or less affected than native workers by large economic shocks because the way they fit in the local labor market might be very context specific.

According to studies conducted by the International Labor Organization (ILO 2020) and by the International Organization for Migration (IOM) together with the World Food Program (IOM and WFP 2020), based on information from countries all around the globe, the Covid-19 pandemic had large economic consequences for migrant workers. Such studies have shown that migrant workers were more vulnerable to the Covid shock on the labor market since they were more likely to work in precarious conditions, more dependent on informal jobs, and less covered by safety nets. Moreover, another study produced by Francesco Fasani and Jacopo Mazza (2020) about migrant workers in the European Union states that migrant workers received

lower wages on average and hence had lower savings capacity, which led them to suffer more with the economic impact of the pandemic.

Additionally, George Borjas and Hugh Cassidy (2020) highlighted, in a study based in the United States, that migrants working in less “remotable” occupations (tasks that can be performed at home) were more affected by the pandemic. However, those working in essential “key” activities, such as healthcare, nursing, cleaning, construction, food production, and agriculture, had their jobs preserved at the expense of higher exposure to the disease. Fasani and Mazza (2020) have shown that migrants were mostly employed in those activities in the case of Europe.

Considering the debate in the literature, this article intends to answer the following question: To what extent international migrant workers were affected by the Covid-19 pandemic in the context of a middle-income country? Did they lose more jobs than nationals? Were their activity sectors more or less affected? This paper provides, then, a contribution to the debate above by addressing the effects of the Covid-19 pandemic on migrant workers in Brazil¹. More specifically, we aim to understand the behavior of hirings and dismissals² of migrant jobs after the Covid-19 shock in 2020 to check the two hypotheses discussed above: first, whether migrants were, in general, more vulnerable to the economic shock compared to natives; and second, how the effects vary depending on the characteristics of labor market integration of migrants, such as their sector and occupation allocation.

Regarding the effects of the Covid-19 pandemic on the employment conditions of migrants and refugees, the Brazilian setting³ is worth analyzing for at least three different reasons. First, Brazil was the second country with the most cases and deaths globally, only after the US. Its Gross Domestic Product fell to the lowest rate since 1996. Labor market conditions in Brazil had already deteriorated before the pandemic, but it has aggravated to an unprecedented state during 2020, with an unemployment rate that reached 14.6%. Therefore, its population suffered large economic consequences.

Second, looking at the Brazilian case brings insights to the debate of contemporary migration from a perspective of the South and a middle-income country. There is much less research and evidence about the impacts of Covid-19 on migrant workers in the context of South-to-South migration since the literature is mostly focused on developed host countries. While Borjas and Cassidy (2020) analyzed the US context, Fasani and Mazza (2020) and Fernando Almeida and José Duarte Santos (2020) analyzed European countries. Barker and team (2020), a notable exception in this literature, which analyzes migrant worker responses in Bangladesh and Nepal.

1. This study focuses on the effects on the labor market. Other dimensions of the possible effects of the pandemic on migrants, including mobility itself and health conditions are not covered here.

2. Here the expression “dismissals” include any type of event when a formal employment contract between an employer and an employee ends. It includes voluntary terminations, retirements, expiration of temporary contracts and dismissals forced by an employer (e.g., firing or layoffs).

3. Brazil has received some attention in the local literature (Baeninger, Vedovato, & Nandy, 2020; Fernandes & Baeninger, 2020).

4. Although our estimates do not rely on an experiment or any other source of exogenous variation, it is reasonable to assume that abrupt changes detected when comparing observations in 2020 with 2019 are related to the pandemic.

5. Register originated from a mandatory document containing all the formal labor information of a worker. This document demonstrated the functional worker situation and allowed access to workers' rights, such as Severance Indemnity Fund, Unemployment Insurance, and other social security benefits.

6. Register that offers information about every working person in the formal labor market, indicating the situation of workers in a given year. Companies within the National Registry of Legal Entity (CNPJ) must declare it every year, all over the national territory. This database is individually available at the level of employment ties, and contains the company information and the geographic level, which provides a high level of disaggregation. Moreover, it is one of the most relevant and largely used sources of information for the Brazilian formal labor market.

7. Register comprising formal

Finally, Brazil has recently received increasingly large flows of migrants, mostly from other developing countries, being a major destination for the Venezuelan and Haitian diasporas. Thus, this article contributes to enlarging the debate on the effects of Covid-19 on migrant workers and, consequently, the discussion on the effects of major economic shocks on migrants' conditions.

The remainder of the paper is structured as follows. Section 2 briefly describes the data sources and explains the methodology employed to extract information from administrative records of the Brazilian formal labor market. Section 3 provides a brief background of the Brazilian migration features, especially the main characteristics of migrant workers in the last decade (2011-2020). Section 4 presents and discusses the findings related to the analysis of the integration of migrants into the Brazilian formal labor market during the pandemic. Finally, Section 5 concludes by discussing the main findings and further highlighting the relevance of study migration in the south-south perspective.

Data and methodology

We framed the investigation based on a quantitative methodological framework to reach the study's objectives and answer the questions above. We examine the effects of the pandemic on migrant jobs considering the Brazilian formal labor market by exploring the features of newly assembled administrative data produced by the Brazilian Observatory of International Migration (OBMigra). The data is publicly available. We identify migrants in the formal labor market after cleaning, merging, and harmonizing administrative records. With the data in hand, we perform a substantial analysis⁴ of hirings and dismissals of migrant workers during the pandemic in 2020, compared with the previous year, 2019, and with native workers. We investigate general trends and heterogeneous responses according to country of origin, education, location, economic activity sector, and occupation.

We use three sources of administrative records: The Work and Social Security Registry (CTPS)⁵, the Annual Social Information Report (RAIS)⁶, and the General Registry of the Admitted and Laid-Off Workers (CAGED)⁷. The three databases were merged using a common person identifier, the Integration Social Program (PIS)⁸ number, using other identifiers such as the Social Security Number (CPF)⁹ and the worker's name¹⁰ as ways to check for duplicated registers. This procedure resulted in the RAIS-CTPS-CAGED annual databases and enabled researchers to analyze migrant movements in the formal labor market. The merging process overcame limitations encountered in each database, allowing us to observe migrants' movements in and out of the formal labor market. Compared to each isolated database, combining the three databases

allowed for the observation of a larger number of migrant workers, more detailed information on their places of birth, and monthly movements within each year.

Formal labor contracts account for approximately 60% of all employment relationships in Brazil (Nitahara, 2019). Immigrants and refugees are generally allowed access to formal jobs through a work permit¹¹. Our focus on the formal labor market owes to data limitations covering our period of study, although it is well known that informality plays a large role in developing countries' labor markets, especially among migrants.

Finally, it is also noteworthy that we do not distinguish between migrants, asylum seekers, and refugees in the analysis. Although we recognize its particularities, the information on the migration status is still unavailable for migrants arriving in Brazil from 2020, restricting the capacity to make comparisons with 2019. We will refer to the general category of migrants or migrant workers to encompass all international migrants, asylum seekers, and refugees in the formal labor market for exposition purposes. Our analysis universe comprises approximately 150,000 individuals (from the end of 2019). We do not consider naturalized citizens in the analysis.

Brazilian migration features (2011-2020)

Migration is a key component of Brazilian society. In the late years of the 19th century up to the first half of the 20th, the country hosted great populations of migrants, coming mainly from Europe, mostly from Italy, Spain, Portugal, Germany, Japan, and Syria-Lebanon. Such migration trends were numerous up to the 1940s. However, during the years of the Second World War (1939-1945), the arrival of migrants in Brazil practically stagnated. Later, the migrant flows did not return to the previous level in the post-war period. Even after the Cold War, the country has received few migrants, mostly from neighboring countries, such as Bolivia (Baenninger, 2012), with most migratory movements concentrated at the borders (Silva, 2015).

Nonetheless, it was from 2010 onwards that there was an unexpected increase and diversification of migration flows to Brazil. From 2011 to 2020, more than a million migrants were documented in Brazil, from which 660 thousand were long-term migrants (residence period of more than one year) (Cavalcanti & Oliveira, 2020). Those migrants came mostly from the so-called Global South countries, such as Senegal, Congo, Angola, Haiti, and Venezuela (Tonhati, Cavalcanti & Oliveira, 2022, p. 95).

The arrival of new migration groups led Brazilian authorities to create a new regulatory and documentation process, leading to significant changes in the legal frame-

workers' hirings and dismissals movements. CAGED adds to RAIS the information on every worker's movement in the labor market and is updated monthly.

8. The PIS number is an individual identifier comprising 11 digits, assigned together with the CTPS issue. It is used to ensure various employment benefits.

9. The Social Security Number (CPF) number is a unique and individual 11-digit identifier provided by the Brazilian Internal Revenue Service to every Brazilian citizen or foreign-born resident. The identification is required to take a civil service examination or to open a bank account, for example.

10. The name verification was accomplished by searching for similar patterns using fuzzy matching. More details for this method are available at: <https://stat.ethz.ch/R-manual/R-devel/library/base/html/agrep.html>. [Viewed 11th March 2021].

11. Work permit here refers to the documentation necessary to access formal jobs (CTPS – Carteira de Trabalho e Previdência Social), not the immigrant's visa. A refugee, for

example, is allowed to have a work permit, even if he/she doesn't have a work visa.

12. Mercosur is a South America trade bloc. It was established by the Treaty of Asunción in 1991 and the Protocol of Ouro Preto in 1994. Its full members are: Argentina, Brazil, Paraguay, and Uruguay. Venezuela is a full member, but it has been suspended since 1st December 2016. The associate countries are: Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, and Suriname.

work during the decade of the 2010s. According to (Tonhati, Cavalcanti & Oliveira, 2022, p. 95), most Haitians seek asylum in the country. However, the Brazilian Refugee Law n. 9,474/1997 and the Geneva Convention (1951) did not authorize in their rules the asylum using environmental disasters (such as the 2010's Haiti earthquake) as a justification for refugee claims. Hence, to organize this migration flow, the National Immigration Council (CNIg) published RNs (Normative Resolutions) n. 27 and n. 97. The first resolution aimed to address Haitian citizens who entered the country without visas and claimed asylum. The second one allowed the Brazilian government to grant a five-year permanent visa exclusively to Haitian nationals for humanitarian reasons. These RNs, in practice, regularize the migratory situation of this group in Brazil.

However, migration events were not restricted to Haitians. The arrival of Venezuelans, from 2015 onwards, led to the need for a new regulatory process. As with the Haitians, Venezuelans' main strategy in seeking regularization was to claim refugee status (Simões, 2017). At first, the Brazilian government did not accept Venezuelans as refugees, since, according to the authorities, it could have led to a diplomatic crisis with Venezuela. However, in 2019, the National Committee for Refugees (Conare) recognized the serious and widespread violation of human rights in Venezuela, in line with the 1984 Cartagena Declaration on Refugees and compliance with the guidelines of the Inter-American Court of Human Rights. Since then, Venezuelans can apply for refugee status and have their procedure accelerated without needing an interview. This procedure has been applied exclusively in the context of Venezuelan or stateless persons residing in Venezuela. Venezuelans cannot have any other type of residence permit to be eligible for refugee status, must be over 18 years of age, possess an identity document, and have no criminal records.

It is still worth noting that in 2017, Brazil approved a new migration law, which replaced the Foreigner's Statute (Brasil, 1980), conceived during the military dictatorship in the middle of the Cold War. The replaced law viewed migrants as a threat to national security, referring to those who intended to live in Brazil without being invited as undesirables. Leonardo Cavalcanti and Wagner Oliveira (2020) note that even under the Foreigner's Statute, the country could advance with progressive and less restrictive measures toward migrants, such as the already mentioned Refugee Law, the Mercosur¹² Residence Agreement, and humanitarian aid toward Haitians and Venezuelans. But on May 24, 2017, the Brazilian legislature approved a new migration Law n. 13,445 of 2017 (Brasil 2017), largely based on the guarantee of migrant rights.

The changes in the migration scenario in Brazil between 2011 and 2020 also include the increase in the presence of migrants in the formal labor market. The total num-

ber of migrants working formally was 55 thousand in 2010 and increased to 147.7 thousand in 2019, which corresponds to an increase of 63%. This is explained by the intensification of Haitian and Venezuelan workers. Most of those workers have been located in the southern region of Brazil (formed by the states of Paraná, Santa Catarina, and the Rio Grande do Sul) and the state of São Paulo, the latter being the largest economic center in the country. Their occupations are mostly associated with agribusiness, especially the meat processing chain.

Nonetheless, this increasing migration pattern was suddenly halted during the Covid-19 pandemic. In March 2020, the Brazilian Federal Government issued a series of inter-ministry ordinances¹³ to regulate entry into the country during the pandemic. The effects on mobility were drastic, as stated by data on border movements, migrant registries, and refugee status requests¹⁴. All of them fell between 50% and 60% in 2020 compared to 2019. The interruption of new arrivals was more severe for the Venezuelans. The land border between Brazil and Venezuela was the first to be closed by the government in March 2020 and reopened partially solely in June 2021. This is in line with the perspective of increased restrictions on international migration after the pandemic (O'Brien & Eger, 2021).

Covid-19 impacts migrant and native workers in the formal labor market

In this section, we discuss our main findings related to the job movements of migrants in the Brazilian formal labor market, comparing 2019 and 2020, using the harmonized RAIS-CTPS-CAGED database. We start by analyzing the movement of admission and dismissals, comparing the effects of the Covid-19 pandemic on the employment average of migrant workers in relation to Brazilian natives. We aim to verify whether migrants' employment posts in Brazil were more vulnerable to the economic shock caused by Covid-19 compared to natives. Secondly, we go deeper into the analysis by focusing on the worker's characteristics to check for the heterogeneity and the pandemic effects with respect to the country of birth, educational achievement, region, economic activity sectors, and occupation to verify if the effects of Covid-19 pandemic vary depending on the characteristics of labor market integration of migrants.

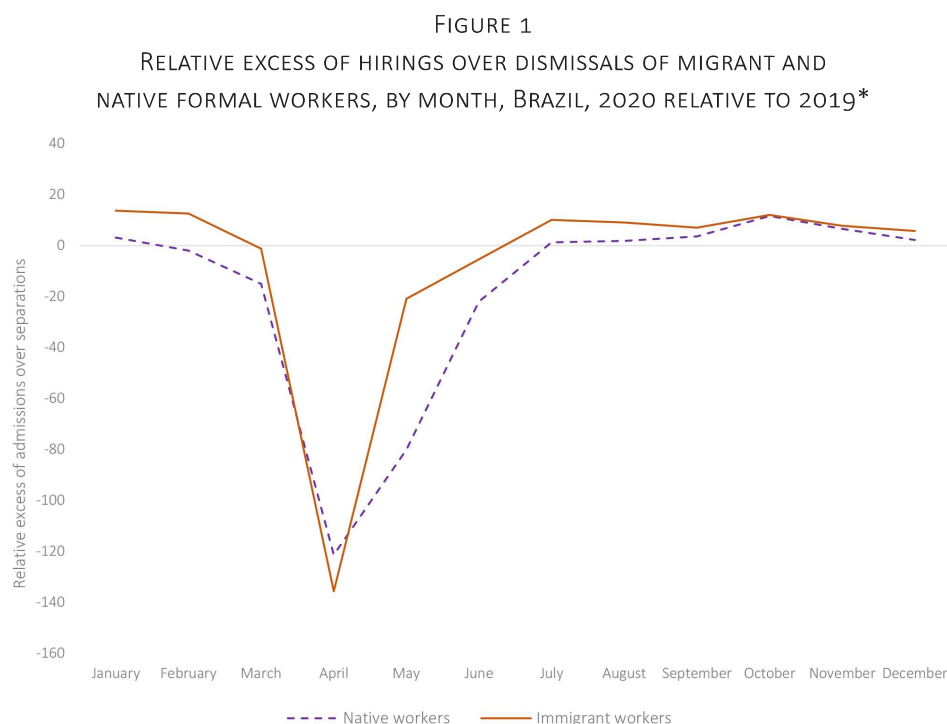
General trends

One of the study's main findings was that on average migrant workers were less affected by the economic impact of the Covid-19 pandemic in 2020 than the average native worker in Brazil in terms of the balance between hirings and dismissals

13. With some exceptions, these ordinances are signed by the Chief of Staff Ministry, the Ministry of Justice and Public Security, the Ministry of Infrastructure, and the Ministry of Health. They are all stored in the following webpage, available from: <http://www.planalto.gov.br/ccivil_03/Portaria/quadro_portaria.htm>. Accessed in: 20 oct. 2020.

14. The data are obtained from the Brazilian Federal Police administrative registries. The border movement data are obtained from the International Traffic System (STI), which records every entry in and exit from Brazil, independent of nationality and category. The immigrant registry data are obtained from the National Migratory Registry System (SisMigra), which records the issue of immigrants' official identification documents. Finally, the refugee status requests data are obtained from the Alert Measures and Active Restrictions System (STI-Mar), which records all asylum claims in Brazil.

in the formal labor market, as shown in Figure 1. To build the measure plotted in this figure, we first calculate the relative net labor market balance (hirings minus dismissals) for each month-year and then calculate the difference between 2019 and 2020. The index captures how better or worse (if negative) the labor market behaved in 2020 compared to 2019 in admitting and dismissing formal workers. At the same time, it allows for the comparison between groups of very different sizes: the average number of admitted migrant workers per month in 2020 is around eight thousand, while for natives, this number is 1.4 million.



* The relative excess plotted in this figure is obtained by first calculating the relative net balance (hirings minus dismissals divided by hirings) for each month-year and then calculating the difference between 2019 and 2020.
Source: Data from the Ministry of Economy, RAIS-CTPS-CAGED harmonized database.

Although the pandemic outbreak resulted in similar reductions for native and migrant workers in April 2020, the recovery of hirings over dismissals was significantly faster for migrants. Not only migrants lost relatively fewer job positions than natives during the pandemic, but their labor market dynamics were even superior in 2020 compared to 2019. There was a positive balance in the year's aggregate of 24,695 migrant job posts in 2020, representing an excess of 24.1% of hirings over dismissals, compared to 22.4% in 2019. For natives, this same measure was negative (-4.0%) in 2020 and positive (7.0%) in 2019.

Importantly to explain this result, the labor market conditions of migrants in Brazil were increasingly favorable before the pandemic. In the first two months of 2020, formal migrant hirings were more than 50% higher than dismissals. This is not only due to seasonality since positive balances were observed throughout 2019. As discussed above, Brazil has been experiencing considerable inflows of migrants in the last decade. Thus, the positive balances indicate that the additional supply of migrant workers was, by some measure, absorbed by the local economy before and even during the first year of the pandemic.

However, the pandemic effects on the formal employment of migrants in Brazil were stronger during March, April, and May 2020. During those months, 18 thousand job posts were opened, but more than 22 thousand were closed for migrant workers. It is important to highlight that, during these months, Brazilian authorities have imposed several mobility restrictions, such as closing restaurants, schools, supermarkets, and shopping centers, among other services. However, the negative employment balance was short-lived in the following months. In June, it became positive, and in July it had already returned to 2019 levels. This finding is relevant because it goes against findings in most of the literature based on South-to-North migration. Such literature tends to show that migrants are more vulnerable to large economic shocks when living in countries of the so-called Global North. However, in the case of South-to-South migration, the effect of Covid-19 and its economic consequences on the employment of migrants was understood differently. In comparison to Brazilian natives, they lose fewer job positions and recover their position more rapidly.

Heterogeneity variables and the impact on migrant's employability

In this section, we aim for a more detailed analysis that helps explain the pattern we found for the average migrant worker in Brazil's formal labor market. We check for heterogeneity in the pandemic effects with respect to the country of birth, educational achievement, region, economic activity sectors, and occupation. We start by looking at the countries of origin of migrants to highlight the two main groups that were more recently settled in Brazil: Haitians and Venezuelans. Because their settlement is more recent, we might expect that the labor crisis hit them harder.

Contrary to that hypothesis, we find that Haitians' and Venezuelans' employability was particularly less affected by the pandemic crisis compared to other migrant communities. The relative excess of Venezuelan hirings over dismissals was among the highest among all other nationalities in 2020 (44%), although slightly lower compared with 2019 (58.1%). Whereas for Haitians, we observed an actual increase

(from 25.7% to 33%). This phenomenon is not observed for the other major nationalities — at least not at the same intensity. European migrants, generally established earlier in Brazil, were the most negatively affected by the pandemic (-47.7%).

We then look at education as a potential driver of our results. We might be tempted to think that more educated workers would be relatively less affected by the pandemic because their jobs are more resilient (Sisk and Donato 2016). However, we observe the opposite. Migrants' educational level and labor market performance during the pandemic in 2020 are negatively correlated. Migrant workers without formal schooling or not having completed primary school had 37.4% more hirings than dismissals in 2020. In contrast, those with an undergraduate degree or more had a negative balance of -7.7%, considerably lower than the positive average (24.1%).

There are two important remarks considering the educational distribution of migrants in the formal labor market in Brazil. The first is that migrants typically downgrade in their labor conditions once they accept jobs that do not require their previous formal skills. This phenomenon is related to difficulties and prejudices they suffer in the host country, such as language barriers, recognition diplomas, and lack of understanding of Brazilian labor laws. These are some factors usually reported by migrants as obstacles to getting a job within their educational capabilities, as other studies have shown (Barbosa et al., 2020). The second remark concerns the low hirings of highly educated migrants in the Covid-19 pandemic in 2020. According to General Coordination on Labor Immigration (CGIL) data, highly skilled migrants in Brazil are usually large companies' executives, such as managers and directors, researchers, and engineers. In this sense, such inflows rather stopped totally since those activities could be performed remotely. Also, artists and other professionals who worked in events were unable to migrate in this period. This might explain at least partly the high decrease in hirings of highly educated migrants. Therefore, the labor market performance of migrants during the Covid-19 pandemic in 2020 cannot be explained by the education level per se. There is a need to verify other variables.

We now turn to the heterogeneous response relative to locations in Brazil to verify if there were differences among the regions regarding migrants' employability. In this respect, except for the South region, all regions experienced decreases in the relative excess of hirings over dismissals of migrant workers—including the Southeast area—that hosts Brazil's two major economic centers (São Paulo and Rio de Janeiro states). On the other hand, the South region experienced a 7-percentage point increase in this ratio between 2019 and 2020. Importantly, this region hosts the majority of migrants in the formal labor market, especially owing to the high

presence of Haitians. Even in the first pandemic year, 2020, the region was the only one in which, net of dismissals, companies admitted more migrants compared to 2019.

In summary, the average profile of migrant workers less affected by the negative labor market consequences of the Covid-19 pandemic is composed of Haitians or Venezuelans, less educated and working in the South region of Brazil, a cluster of migrant workers. This is not exactly the profile we expect to be less vulnerable to such a large economic shock. In this sense, we turn our investigation to the occupations and economic activity sectors that employed more migrants in Brazil to understand better the reasons that led migrants' employability to be less affected by the Covid-19 pandemic crisis. We argue that the major driver of this result is a combination of occupation and economic activity sector allocation of most migrant workers in Brazil.

Most migrant formal workers in Brazil are employed in essential activities that continued during the Covid-19 pandemic, mostly in the manufacturing sector. To have a closer look at the economic activity sectors, we looked at the five most frequent activities¹⁵ in each sector, considering the total number of migrant worker movements (admissions and dismissals) in 2019. Within that set, the two activities that most admitted migrant workers in 2020 (net of dismissals) were slaughterhouses (poultry and swine), followed by supermarkets (retail) and building construction. None of these activities can be performed remotely. They were considered essential activities, which should continue during the pandemic, and some of them increased their performance and demand due to people's behavioral changes. For example, people increased consumption at home at the expense of going to restaurants.

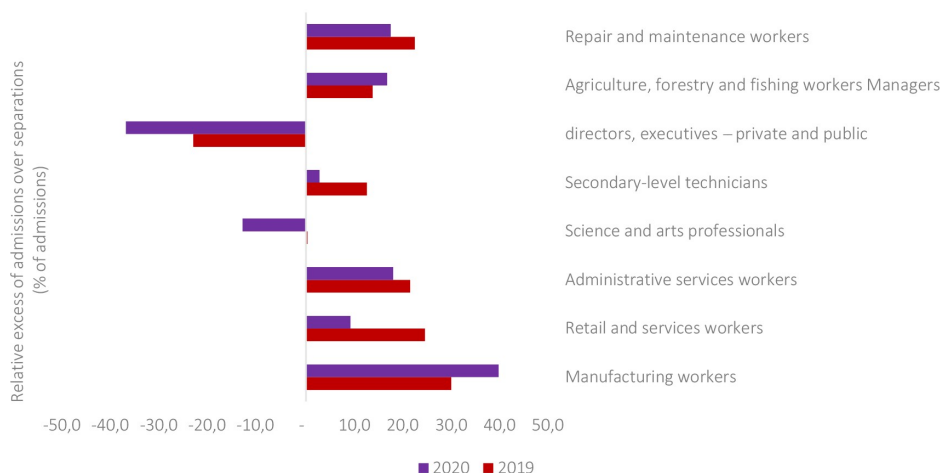
Additionally, the agribusiness chain in Brazil, particularly the livestock, is oriented toward exports, with prices established in American Dollars (USD). The USD is highly appreciated against the Brazilian currency — the Real (BRL). Thus, as they were exporting more, they were enlarging their business, demanding more labor and earning more profits.

In line with the economic activity sector results, the two occupations¹⁶ with the larger excess of admitted over-separated were butchers and production line workers, followed by construction and logistics occupations. On the other hand, migrants working in the retail and services sector have their employability strongly affected by the Covid-19 pandemic, as shown in Figure 2. This is mostly explained by migrants being dismissed in restaurants, bars, hotels, travel agencies, and apparel stores. The largest absolute negative balances in 2020 are observed among occupa-

15. We use National Classification of Economic Activities (Classificação Nacional de Atividades Econômicas – CNAE) — 2.3 subclasses (7-digit).

16. We use the concept of Brazilian Classification of Occupations (Classificação Brasileira de Ocupações – CBO) — occupational families (4-digit). The occupations (6-digit) are too detailed for the sake of this analysis.

FIGURE 2
RELATIVE EXCESS OF HIRINGS OVER DISMISSALS (% OF HIRINGS)
OF MIGRANT FORMAL WORKERS, BY OCCUPATIONAL GROUPS, BRAZIL, 2019-2020*



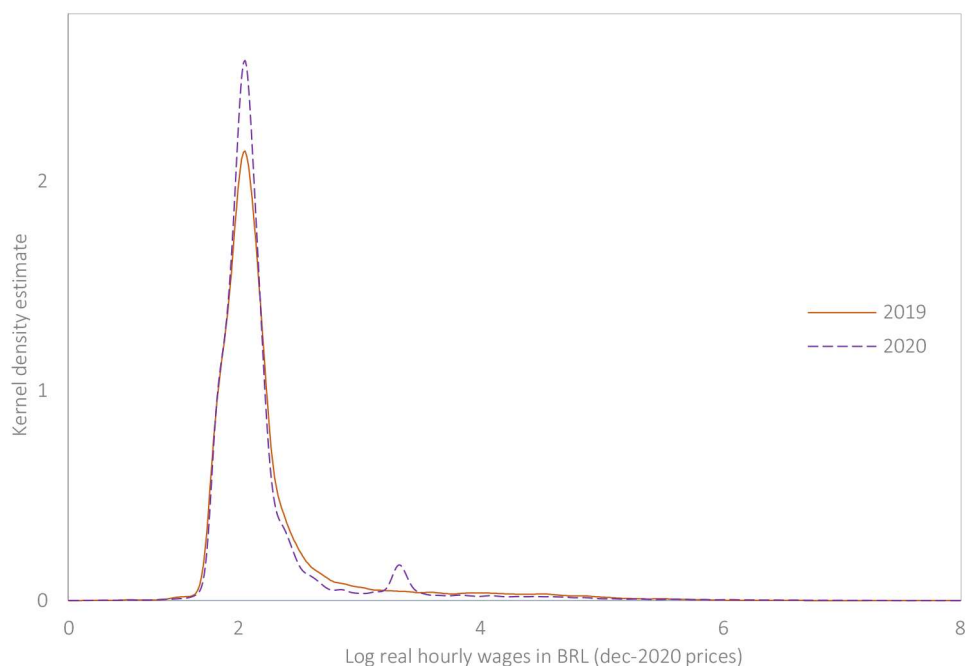
* The figure shows occupational groups (1-digit CBO – Classificação Brasileira de Ocupações). We removed the armed forces occupational group because only three hirings and dismissals were registered in 2020 (none in 2019).
Source: Data from the Ministry of Economy, RAIS-CTPS-CAGED harmonized database.

17. In 2019, the Brazilian minimum wage was BRL 998 monthly, which was equivalent to USD 273, whereas in 2020, it was BRL 1,045 (USD 245), using beginning-of-year exchange rates. Applying the deflator, dividing by the number of weeks in a month and the typical number of hours worked in a week (40) and applying the log, we get to BRL 1.9, which is exactly where the distribution in Figure 3 peaks. The plot uses earnings in BRL to avoid confusion with the effect of the real depreciation in the period, which would shift the distribution to the left in 2020. It is noteworthy, though, that this is another source of lower purchasing power of migrants owing to the pandemic.

tions such as store attendants, needle workers, receptionists, managers and cooks. For managers, negative balances had already appeared in 2019. However, the relative account suggests their situation was even worse in 2020, probably reflecting the decrease in employer-demand for highly educated workers from abroad mentioned earlier. Those activities and occupations were restricted during the mobility constraints imposed by the Brazilian state's governments, and they also took longer to recover. This is reflected in Figure 2 in science and arts professionals, executive managers, and directors.

It is noteworthy that typical migrant occupations do not demand high levels of education, implying that salaries are very low on average (around the Brazilian minimum wage)¹⁷. The Covid-19 pandemic might not have been a large blow to job-finding rates, but it changed the wage distribution towards lower wages, as shown in Figure 3. The figure considers the large dispersion of wage values by taking the log and the fact that the workload might also have changed due to the pandemic by calculating hourly wages. We observe that both 2019 and 2020 distributions peak around the minimum wage. The peak is higher in 2020, whereas the right tail is lower, probably reflecting the high rate of dismissals of highly educated workers. Moreover, this is associated with the sectors and occupations that performed bet-

FIGURE 3
 KERNEL DENSITY ESTIMATE OF THE LOG OF REAL HOURLY WAGE DISTRIBUTION
 OF MIGRANT FORMAL WORKERS, BRAZIL, 2019-2020*



* Wages are deflated by the main Brazilian Consumer Price Index (IPCA), considering prices fixed in December 2020. Because the number of hours worked is unavailable, but only in groups (e.g., 41-44 hours worked in the week), hourly wages were calculated by dividing each wage by the higher number of hours worked in each group (44 in this case) and then by four weeks in a month. Only hirings were considered, and we excluded values lower than 0.3 and higher than 150 minimum salaries since they were likely to be imputation errors. Furthermore, we did not consider intermittent workers. The kernel density was calculated using default options from the R package ggplot2, including the Silverman rule of thumb bandwidth selector (nrd0) and a Gaussian kernel.

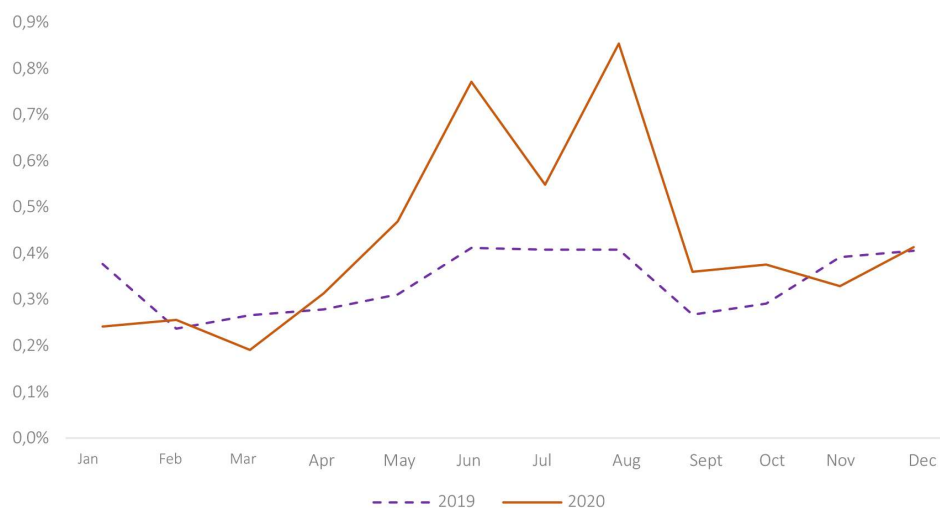
Source: Data from the Ministry of Economy, RAIS-CTPS-CAGED harmonized database.

ter during the pandemic, usually associated with low-paying jobs.

We finally highlight that the Covid-19 pandemic might have also affected the labor market integration directly through the effect of the disease on the worker's health, which might have increased work leave incidence and duration and eventually dismissals caused by a worker's decease. Although we cannot identify the cause of the death, we can measure the proportion of dismissals caused by a worker's decease and assume that a substantial increase in deaths in 2020 might be associated with Covid-19.

Figure 4 shows monthly dismissals caused by a worker's decease as a proportion of total dismissals of migrant workers in 2019 and 2020. We can observe that when the pandemic peaked in the number of cases and deaths (from May to September 2020), the proportion increased substantially more than in 2019. Workers in "other

FIGURE 4
MIGRANT FORMAL WORKERS DISMISSALS CAUSED BY
A WORKER'S DECEASE AS A PROPORTION OF TOTAL MIGRANT
FORMAL WORKERS DISMISSALS, BY MONTH, BRAZIL, 2019-2020



Source: Data from the Ministry of Economy, RAIS-CTPS-CAGED harmonized database.

services” were more proportionally affected. Since this category includes health services, migrant workers more exposed to the virus might also have shown a higher probability of death during this period. In addition, we observe no significant differences in this proportion between 2019 and 2020 for the manufacturing sector.

In sum, our analysis highlights that the average employment status of migrant workers in the formal labor market in Brazil was preserved during the Covid-19 pandemic. This is explained by the features of labor market integration of recently settled migrants in Brazil. They were employed in occupations and economic activity sectors that were, on average, less affected by the mobility restrictions imposed by the pandemic.

However, this does not mean that migrants did not suffer negative consequences of the pandemic regarding their employability. On the one hand, inequalities arise in the labor market dimension per se: migrant workers allocated in services such as restaurants and hotels were heavily affected. On the other hand, even those that had their jobs preserved might have been more exposed to the virus. Indeed, slaughterhouses are highly exposed to contamination by the new coronavirus, considering that the work is carried out in a closed space and the workers are close to

each other in the production line. According to Mota (2020), in research carried out in the city of Xaxim, in Santa Catarina, there was an increase in the number of cases among migrants due to transmissions in slaughterhouses. According to Tonhati (2021), migrants are also more vulnerable to contagion outside work since they usually live with several other migrants and their families. In this way, the transmission of the virus becomes faster due to the impossibility of applying any type of social isolation.

Thus, we argue that the sector-occupation allocation was an important driver of migrant workers' well-being during the pandemic. Moreover, being employed during the pandemic was important to migrants, but particular groups might have been affected differently depending on individual characteristics and sector-specific trends. Hence, the analysis presented here allows us to unpack some inequalities behind the effect of the Covid-19 pandemic on migrant workers.

Concluding remarks

This study analyzes the effects of the Covid-19 pandemic on migrant workers in the Brazilian formal labor market. After assembling a rich database of administrative data from Brazilian registries, we could analyze the phenomenon by looking at hirings and dismissals dynamics during 2020 using the previous year as a comparison benchmark. We explore how different groups of workers were affected and how the characteristics of the recent inflows of migrants to Brazil explain much of the patterns emerging in the data.

We showed that the pandemic did not impose a large and long-term negative shock for migrant workers in the Brazilian formal labor market. Remarkably, they were not more affected than native workers. Migrants' sector allocation in labor-demanding activities that already hired migrants before the pandemic were less affected by the mobility restrictions. The particular characteristics of the sector (those that performed well during the pandemic), occupation (mostly essential ones) of migrant workers and the halt on migrant labor supply due to movement restrictions, are among the reasons because the Covid-19 pandemic was short-lived for most formal migrant workers in Brazil.

By analyzing subgroups of migrant workers, we also demonstrated that these effects were unequally distributed. Haitian and Venezuelan workers with low educational attainment at the end of the agribusiness chain in the South region of Brazil kept finding jobs at a higher rate than losing jobs. Due to the pandemic, other groups of migrant workers in restaurants, bars, hotels, and other restricted activities suffered

larger losses. Furthermore, we found that highly educated migrants' admissions fell abruptly, possibly owing to the sudden reduction of employers-demand.

In the case of Brazil, the degree of remotability of activities did not play a major role as in the US (Borjas and Cassidy 2020). However, the degree of essentiality — key activities, as in Fasani and Mazza (2020) — and dependency on exports played a major role in explaining our high heterogeneity. The uneven distribution of impacts across different migrant population profiles should be an object of concern for public policy.

Finally, we observed two explicitly negative consequences of the Covid-19 pandemic on the labor market for migrants. The first is a change in the wage distribution toward low salaries, indicating that activities and occupations that performed better during the pandemic offered relatively worse working conditions. The second is an increase in dismissals caused by a worker's decease, which is probably related to higher exposure to Covid-19 in so-called essential occupations.

It is noteworthy that saying that the balance between hirings and dismissals of migrant workers was not largely affected by the pandemic does not mean that these workers are not vulnerable or even that their living conditions have not worsened during the pandemic. For instance, the same devaluation of the exchange rate that benefited export-oriented sectors and increased admission of migrant workers also certainly played a negative role in remittances. In that sense, this study highlights that the pandemic probably reinforced a typical labor relation established among migrants in the formal labor market in Brazil: low-paying precarious jobs in sectors producing primary goods. This leads to a discussion of the current structural economic development model in Brazil (and in other developing countries) that is beyond the scope of this study.

There is still a large research agenda regarding the impacts of the pandemic on migrant populations, including going beyond labor market integration. We acknowledge that the formal workers are not the most vulnerable migrants. Therefore, we could look at how these populations accessed public services and goods during the pandemic (for example, the federal government's emergency benefit for informal workers). Moreover, there is a need to analyze the labor market dynamics in the other years, to compare between the beginning and the end of Covid-19 pandemic.

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