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**Structural transformation and the platform economy in the labour market:  
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**Abstract**

For nearly a decade, the Brazilian labour market has suffered from periods of deep crisis marked by the growth of unemployment and informality. In this general context, platform jobs, which emerged around 2016, appear with unequaled dynamism in job creation. However, it is difficult to quantify and qualify this phenomenon to date due to the lack of a suitable measuring instrument in Brazil and on a global scale. The nature of jobs and their quality is largely unknown. Therefore, this study has a dual objective. On the methodological front, it aims to contribute to the debate on the concepts and statistical tools needed for measuring the scale and the characteristics of this new type of job reliably. The empirical work is mainly based on the intensive processing of micro-data from the PNAD Contínua (the Brazilian Labour Force Survey). The changes observed in the various job characteristics over the long term as a result of the analysis provide an assessment of the relevance of the approach. On the analytical front, we propose to draw up a panorama as reliable as possible of platform employment in Brazil in its different dimensions (job structure and workers' characteristics, working conditions and earnings, professional trajectories, contribution to the household economy), focusing on the most "visible" of them: drivers and delivery workers. We show that these platform jobs in the transport sector represent a real opportunity. The vast majority of the jobs created are permanent and contribute significantly to the household economy. They are not just occasional jobs for supplementary income. Nor are they a stepping stone to formal employment. However, the jobs are of low quality: in terms of working conditions, they fall between informal and formal workers but closer to the former. Moreover, it should be stressed that their situation tends to deteriorate over time, becoming increasingly precarious.

**JEL code:** E26, J21, J81, L16, O17, O33, O54

# 1 - Introduction<sup>1</sup>

Since the mid-2010s, platforms have come into force in Brazil, one of the world's most connected countries (applications, social networks). Although still possibly marginal in quantitative terms, the jobs generated by platforms have grown impressively. More broadly, this new generation of jobs is part of a reconfiguration of the Brazilian labour market in which the boundaries between formality and informality have become blurred in the context of lasting crises that the Covid-19 pandemic has exacerbated (Razafindrakoto, Roubaud, and Saludjian 2022). However, despite the emergence of a body of literature in the country and abroad, there are still huge gaps in knowledge on platform economy, starting with the simple quantification of the phenomenon. Beyond the diversity of themes and approaches that it is difficult to summarise, two recurring questions run through most analyses of platforms centred on the labour market: On the one hand, to what extent do platform jobs correspond to the net creation of new jobs, or do they replace existing jobs? On the other hand, is the observed dynamism of platform jobs to the detriment of their quality? This second question will be one of the main issues addressed by this paper.

Among the changes underway, one may ask if the platform economy will lead to a reconfiguration of the labour market and what the implications will be on the future of employment. In the case of Latin America, there seems to be a consensus on the precarious nature of jobs: instability of work and earnings, unpaid working hours, long working days, lack of protection and intermediary bodies for representation and professional dialogue (Alba Vega, Bensusán, and Vega 2021; CEPAL 2022; CEPAL and OIT 2021; Farías Valenzuela 2021; García and Javier 2020).

In Brazil, the academic literature on platforms is still embryonic despite renewed interest in recent years. The vast majority of empirical economic studies, the approach adopted here, seek to quantify and describe the profile of platform workers (Barros 2021; de Carvalho and Nogueira 2023; CEBRAP and AMBIOTEC 2023; Góes, Firmino, and Martins 2021, 2022). The work edited by Machado and Zanoni (2022) is undoubtedly the most accomplished contribution in this field. All these studies, both qualitative and quantitative, confirm the results obtained in other countries, namely the dynamism of the sector and the precariousness of working conditions, although it is not possible to quantify these features precisely for measurement concerns. Therefore, they also highlight the lack of reliable data and the formidable methodological challenges in identifying the platform economy in official and unofficial statistics (Frosch 2023).

This article elaborates on previous papers. It focuses on platform workers in the transport sector, the only sector that can be (imperfectly) approached in the surveys produced by the IBGE (see Section 2). More precisely, we examine the situation of drivers and delivery workers (DDWs). The empirical analysis uses data from the PNAD Contínua (2012-2023), the Brazilian Labour Force Survey. We take a medium-to long-term perspective to analyze how the structure of the labour market has changed and to what extent the arrival of platform workers has brought about transformations. The questions we seek to answer are: has the platform in the transport sector been a particularly dynamic source of job creation? Are the jobs of drivers and delivery riders/drivers (DD) of good quality or “on the cheap”? Are they more akin to formal or informal jobs? Where do DDWs come from, and what happens to them in the labour market? Is this type of job a stepping stone towards formalization for informal workers, unemployed or young people looking to enter the labour market, as is often assumed, or is it a permanent job? A job that may be unsatisfactory, but from which there is no way of moving to a better situation? How do they fit into the household economy: are they just backup jobs that generate additional income, or are they a mainstay for the households that use them? Are DD jobs a refuge for the most vulnerable social groups?

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<sup>1</sup> Nous remercions Mathilde Bouvier et Kethelyn Ferreira pour leur appui au traitement statistique de certaines données.

All these questions are addressed along two cross-cutting lines: on the one hand, the evolution of the DDWs' characteristics over time, and on the other, the internal heterogeneity of the platform universe.

This paper contributes to the literature in various respects. Firstly, on the methodological front, the analysis period is extended compared with previous studies. This enables analysis over a longer period of time, a better way of measuring and tracking a moving phenomenon that is not easily captured by traditional surveys. Secondly, it offers a broader perspective by placing DDWs in the context of the labour market as a whole. These points of comparison are all the more important given that one of the objectives is precisely to situate DDWs in comparison with formal and informal employment and their relationship with unemployment. Thirdly, it goes beyond the purely individual approach by analysing the integration of DDWs into the domestic household economy. Fourth, adopting a micro-dynamics approach, it takes advantage of the panel structure of the PNAD-C to develop job transition matrices and, thus, to analyze the individual trajectories of DDWs to our knowledge for the first time. Fifth, it goes beyond descriptive statistics by proposing some econometric estimates. In the end, the paper answers several questions (mentioned above) that remain largely unexplored in the Brazilian case.

Following this introduction, the paper is organized as follows. Section 2 presents the Brazilian context, a brief literature review, and the methodological approach. Section 3 provides the big picture through the first descriptive analyses of employment, earnings and jobs attributes dynamics, and workers' characteristics. Section 4 goes beyond the initial findings with more sophisticated analyses of earnings equations and individual transitions. Section 5 provides a way of summarizing the results using multidimensional analysis techniques: multiple correspondence analysis (MCA). Section 6 concludes by summarising the results, highlighting the limitations, and outlining some prospects for future research.

## 2 – Context, Methodology and Data

### 2.1 Context and literature review

Labour platforms encompass a heterogeneous set of activities. They are commonly divided into at least two major groups: (i) digitally delivered services involving tasks completed through online platforms that potentially connect customers and workers on a global scale all over the world, and (ii) on-location services, including activities such as passenger transport, food delivery, and cleaning, which are facilitated and controlled through apps managed by firms (ILO,2021; De Stefano & Aloisi, 2018). This article focuses the analysis on the second group restricted to DDWs, distinguishing two types of occupation: drivers of passengers and delivery drivers/riders.

In Brazil, according to Carvalho and Nogueira (2023), individual passenger transport apps were introduced by a national company named 99, founded in São Paulo in 2012. At that time, the app only offered conventional taxi services. However, the service for hiring independent drivers via apps emerged in the country with the arrival of Uber's company operations in the cities of Rio de Janeiro and São Paulo in 2014. The following year, the operations extended to the cities of Belo Horizonte, Brasilia and Porto Alegre. From there, UBER rapidly expanded its services in several major cities across the country to be accessible in 115 cities as of 2018. The actual expansion of this mode of transport occurred when Uber began to extend its geographical coverage in 2016, then in 2017, with the increase in scale of 99, which received a significant contribution from a Chinese investor, and finally with the arrival of Indrive, which opened its doors in the country in 2018.

Carvalho and Nogueira (2023) also state that delivery apps were introduced by a national company, initially established as Disk Cook in 1997, serving only São Paulo and relying on a telephone center. The company rebranded to iFood in 2011, but the substantial growth of the app operations started only in 2014. Its main competitors, Uber Eats and Rappi, entered the Brazilian market in 2016, and 2017, respectively.

iFood has established itself as Brazil's leading app-based delivery company, with over 200,000 registered workers (Fioravanti, Martins, and Rizek 2023). It is important to note that there are two ways to engage in delivery work with iFood: through the "cloud" model or working with the intermediation of a LO (Logistics Operator). Cloud delivery workers have the flexibility to deliver wherever they choose and can start working immediately after the approval of their registration. They receive their payments weekly directly from the platform. In contrast, for the latter, a Logistics Operator acts as an intermediary between the platform and the delivery workers, managing specific sub-areas of the city. They have the option of being paid either daily (with a fee) or weekly.

The analysis of the market entry and expansion of the principal apps of this type establishes that 2015 could be considered the initial milestone of the phenomenon known as *platformization*, *uberization* and *just-in-time* work in Brazil. Platform work, or "Uberization," is a marker of this new work regime (Abílio 2020; Abílio, Amorim, and Grohmann 2021; V. M. De Stefano 2016). Among these "just-in-time" work app companies, iFood, Rappi, Uber Eats, and 99 are identified as representatives of this movement. The peculiarities of the business model they design are crucial for understanding the new forms and conditions of work (ILO 2021a).

As in all the countries where we have seen an expansion of the Uberization phenomenon, its impact raises many questions. To recall the debate quickly, it mainly concerns the changes it brings about in the labor market, with the job opportunities it creates on the one hand and the question of the quality of these jobs on the other hand. Those in favour of platform expansion, for example, point to the lower transaction costs that enable more efficient use of resources (Nurvala 2015). In its early days, we talked about a new model called the 'People-to-People Economy' where online platforms match self-employed individuals who provide services to customers. The absence or low barriers to entry for self-employment also creates opportunities for low-skilled and unskilled workers. The flexibility of jobs is also praised for enabling domestic activities such as childcare or care for the elderly (Hall and Krueger 2018; Peticca-Harris, Degama, and Ravishankar 2020).

At the same time, a defining characteristic of all types of platform work, with implications for working conditions, is the transfer of economic risks to the worker. This is achieved, for instance, by classifying platform workers as independent contractors (Veen, Barratt, and Goods 2020). With this classification, workers, rather than platforms, are responsible for providing their own equipment and paying taxes (V. De Stefano and Aloisi 2018). Many studies highlight the concomitant risk of job casualization (Graham, Hjorth, and Lehdonvirta 2017; Hoang, Blank, and Quan-Haase 2020; Urzì Brancati, Pesole, and Fernández-Macías 2020; S. P. Vallas 2019; Van Doorn 2017)(Graham et al., 2017; Hoang et al., 2020; Van Doorn, 2017; Vallas, 2019; Brancati et al., 2020). The absence of social protection, the unstable nature of jobs, and low pay are also factors to consider.

Indeed, while some people value the flexibility of this type of job carried out in this way to provide a supplementary income (Hall and Krueger 2018), others, like the UBER drivers in Kerala, India, carry it out as their main job and complain about the charges and lack of support from the authorities (Soja Rani 2018). These various findings also raise the question of whether Uberization has a positive effect on reducing inequality (notably by limiting exclusion phenomena, or, on the contrary, whether it exacerbates it (Drahokoupil and Jepsen 2017; Graham, Hjorth, and Lehdonvirta 2017). Poor data availability and measurement difficulties make discussions of empirical findings more complex. For example, a field survey in the US found that most drivers valued the flexibility of this type of job (Hall and Krueger 2018). However, some studies criticize this optimistic analysis, pointing to methodological problems, as the survey mentioned below reached only 11% of the workers concerned (Berg et al. 2018).

## 2.2 Measuring digital platform employment: concepts, definitions, and data

The measurement of platform employment is a formidable methodological challenge, as yet unresolved on an international scale (O'Farrell and Montagnier 2020; Piasna 2021; Urzi Brancati, Pesole, and Fernández-Macías 2020). First, there is the problem of definition: what is a platform job? Then, there is the problem of statistical measurement. None of the three main variables used to classify jobs in the Labour Force Surveys (LFSs), as covered by international nomenclatures (industries: ISIC, occupations: ISCO, and status in employment: ICSE) can be used to identify platform jobs precisely. On the one hand, by their very nature, platform jobs can exist in numerous sectors and occupations. Secondly, the standard ICSE nomenclature distinguishes 5 basic categories: employee, employer, own account worker, contributing family worker and apprentice. However, the emergence of new forms of jobs in the last decades poses a huge challenge for conceptual and statistical measurement, which the ILO has taken on board.<sup>2</sup> This difficulty is particularly acute in the case of platform jobs, which straddle the boundary between salaried employment and self-employment. Like independent workers, independent contractors engage in commercial agreements. However, like dependent workers, they rely on another entity for work that exercises operational or economic control (ILO 2018). However, operationalising this new status is not straightforward and is still an ongoing process at the world level.

Brazil is no exception in this respect. The PNAD-C, the Brazilian LFS we use in this paper, constitutes the most complete database on the labour market. However, it does not allow platform jobs to be identified precisely. Among other things, the concept of 'dependent contractor', which would have been the best way of approaching the phenomenon, has not yet been introduced into the survey. For this purpose, the IBGE (Instituto Brasileiro de geografia e Estatística; the Brazilian National Statistics Office) designed a specific module of a few questions grafted to the PNAD-C on platform workers. The survey was conducted as 'experimental statistics' in the 4th quarter of 2022 (IBGE 2022). Despite its undoubted interest, this one-off module cannot serve as a basis for this paper, which seeks to analyse the temporal dynamics of the sector. We will nevertheless use the 2022 *Platform Workers* module to assess the relevance of our approach.

Like previous studies, we made operational methodological choices in an attempt to approximate the phenomenon of platform employment as closely as possible. Firstly, this article focuses on the transport sector (passenger and freight). The transport sector is the easiest to identify empirically, the most visible and the most emblematic of the development of platforms in Brazil. More importantly, according to the 2022 *Platform Workers* module, it accounted for almost 90% of platform jobs across all sectors (see below). Secondly, in the absence of a precise definition of platform jobs, we constructed a proxy variable that cross-references three variables: employment status, sector of activity, and occupation (Table 2.1). We selected only self-employed workers. However, we cannot rule out the possibility that some platform workers may have falsely declared themselves as employees due to their ambiguous job position, or that they may actually be employees, being contracted by intermediary firms that supply workers to the platform. Thirdly, we distinguish two types of jobs within the transport sector: drivers (of

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<sup>2</sup> As quoted by the 20<sup>th</sup> ICLS: "A central concern is that the five substantive categories defined in ICSE-93 do not provide sufficient information to adequately monitor the changes in employment arrangements that are taking place in many countries and are not sufficiently detailed to monitor various forms of non-standard employment. A variety of new, or non-standard, arrangements that aim to increase flexibility in the labour market are also generating a need for statistical information to monitor the impact of these arrangements on workers and the functioning of the labour market. Some of these arrangements change the balance of economic risk between workers and enterprises and are leading to uncertainty about the boundary between self-employment and paid employment" (ILO 2021b).

passengers) on the one hand and delivery drivers (of goods) on the other. For passenger transport, only car drivers are included. Among delivery drivers, the vast majority are motorbike drivers. The remainder are delivery drivers on bicycles or foot. Mototaxis are excluded from the analysis. In Brazil, these are traditional activities in which the platforms have recently established themselves. The number of jobs in this sector has stagnated over the past decade (around 200,000), unlike the other two categories, which have grown exponentially (Gesteira and Pero 2024; Nazareno 2023).

Furthermore, in our comparative perspective related to the issue of informality, we adopt the official IBGE definition of informal employment, which is itself in line with international recommendations (Frosch 2023), i.e., all jobs that do not benefit from the public social protection system. Other types of comparison would have been possible, in particular with jobs that are a priori closer to DDWs: for example, workers in the private sector, own-account workers in the service sector, etc. (Dick et al. 2023). Nevertheless, we consider broader comparators for two reasons. On the one hand, at the macro level, it makes it possible to situate DDWs within the labour market as a whole. Secondly, at the micro level, in terms of transition, individuals change status not only to occupy similar jobs. The range of choices open to them embraces the entire spectrum the labor market offers. For example, a taxi driver is not restricted to remaining a driver but can become an employee of a public or private firm, an informal worker in another sector, or even leave the labour market. Finally, we restrict the analysis to urban areas, as platforms were not yet active in rural areas. Furthermore, the functioning of the urban and rural labour markets differs greatly. Finally, it should be pointed out that the analysis focuses mainly on main jobs. However, this bias is limited as only around 5% of all platform jobs are secondary jobs (4% for the labour market as a whole).

**Table 2.1 Empirical definition of Drivers and Delivery own account workers (DDW-OAW) in PNAD-C**

Occupation \ Sector	49030 - Road transport of passengers	49040 - Cargo road transport	53002 - Delivery activities
8321 - Motorcycle drivers	–	goods delivery	goods delivery
8322 - Drivers of cars, taxis and vans	App driver and taxi driver	–	goods delivery
9331 - Drivers of pedal-operated or arm-operated vehicles	–	goods delivery	goods delivery

Source: Authors' elaboration; adapted from Góes, Firmino, and Martins (2022).

These methodological choices have obvious analytical implications. Firstly, taxi drivers are included in our universe. While a growing number of them are using apps, this was not the case before the arrival of platforms in Brazil in 2014-2015. Secondly, there is no guarantee that all selected jobs are platform jobs. The 2022 *Platform Workers* module makes it possible to accurately measure the links between our typology and genuine platform workers. Table 2.2 shows that while the total number of jobs identified is similar, the differences between the two groups are very large. Thus, of the 1.24 million genuine platform DDWs, 421,000 (or 34%) are not included in our typology (and, therefore, in previous studies). Conversely, of the 1.36 million self-employed DDWs identified in previous studies, 537,000 (or 40%) are not genuine platform workers. The differences concern delivery workers more than drivers. For example, of the 541,000 delivery workers, the typology based on the standard PNAD-C correctly identifies only 178,000, a rate of 31%. This can be explained by the fact that some delivery drivers are not self-employed (Magaldi et al. 2024). This rate rises to 89% for drivers. As a result, previous studies provide a very imperfect picture of the world of platform workers.

**Table 2.2: Comparison of the distribution of platform workers by source**

Proxy PNAD-C (Q4-2022)			
1,000	DDW-OAW	No DDW-OAW	Total
<b>Platform Worker Module</b>			
<b>DDW-App</b>	819	421	1 240
<b>No DDW-App</b>	537	86 712	87 249
<b>Total</b>	1 356	87 133	88 489

Source: PNAD-C, Q4-2022, *platform workers* module, IBGE; authors' calculations.

Note: in the first line, 421,000 genuine DDWs are not identified in the traditional PNAD-C; in the second line, 537,000 are classified DDWs when using the proxy method in the PNAD-C but are false positives according to the 2022 Platform Workers module.

The data used in this article comes from the PNAD-C and covers the period 2012-2023. It is the only source available that covers the entire labour market and jobs, both formal and informal. The PNAD-C is reputed to be of high quality. It includes a wide range of variables characterising jobs and workers. The samples are large (Table 2.3), enabling precise estimates to be computed. In addition, and alongside the analysis of macro-economic dynamics, based on 12 rounds of annual cross-section surveys, the paper addresses micro-dynamics at the individual level, relying on transitions in the labour market. To do this, we took advantage of the panel dimension of the PNAD-C to calculate all transitions from one status to another and elaborate quarterly mobility tables, which were then aggregated at the annual level for each year from 2012 to 2023. The years 2012-2015 are taken as the benchmark period, just before the platform entry in Brazil. 2023 is the last year available in the PNAD-C data.

**Table 2.3: Sample size by sector 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
DDWs	829	743	821	857	993	1152	1441	1748	1353	1424	1832	2023
Others	146238	15012	151641	149060	145446	144185	14347	136921	106771	101639	121243	126235
Total	147067	150863	152462	149917	146439	145337	144911	138669	108124	103063	123075	128258

Source: PNAD-C 2012-2023, IBGE; authors' calculations.

In conclusion, the DDWs selected in this paper only imperfectly capture the universe of genuine platform workers. The results must be interpreted with all due caution, as quoted above. Nonetheless, they are the best way of approaching platform workers and documenting their evolution over time.

### 3. Employment, earnings, and job characteristics dynamics

#### 3.1 Jobs against earnings?

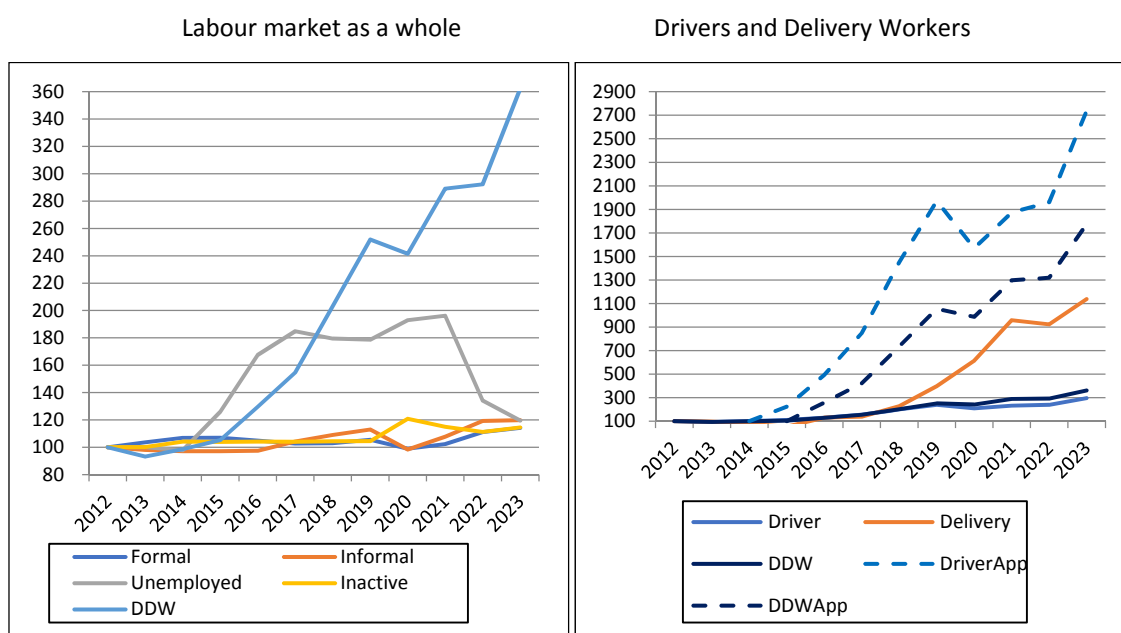
##### *A sharp rise in the number of platform workers ...*

The evolution of jobs since 2012 clearly reflects the extraordinary dynamic of platform workers. Absent from the labour market before the arrival of platforms in 2015, they have grown exponentially (Figure 3.1). While overall employment (formal and informal) stagnated and even declined during the 2015-2016 and 2020-2021 crises (Razafindrakoto, Roubaud, and Saludjian 2022, 2023), the number of platform workers exploded. As presented in the previous section, it is difficult to estimate the true growth rate (both because this type of job did not exist before 2015 and because taxis are included in



our data), but the break in 2015 is very sharp. The number of DDWs has multiplied by 3.6 between 2012 and 2023, with a clear difference between Drivers (+150%) and Delivery workers (850%). In reality, growth has been even more brutal. The slower growth of App Drivers is largely a statistical artifact, as our proxy also included non-App taxi drivers. Following the hypothesis of a constant number of Non-App taxi drivers (around 400.00), the growth rate of App Drivers reached an astonishing 1,500% between 2015 and 2022, while the same hypothesis gives + 1,600% for App Delivery workers (between 2016 and 2022).

**Figure 3.1: Employment growth by sector 2012-2023 (100=2012)**



Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

Note: panel b, DDWs growth rate, assuming that the number of taxis and Non-App delivery drivers has remained constant since the platforms' arrival.

*... to the detriment of earnings?*

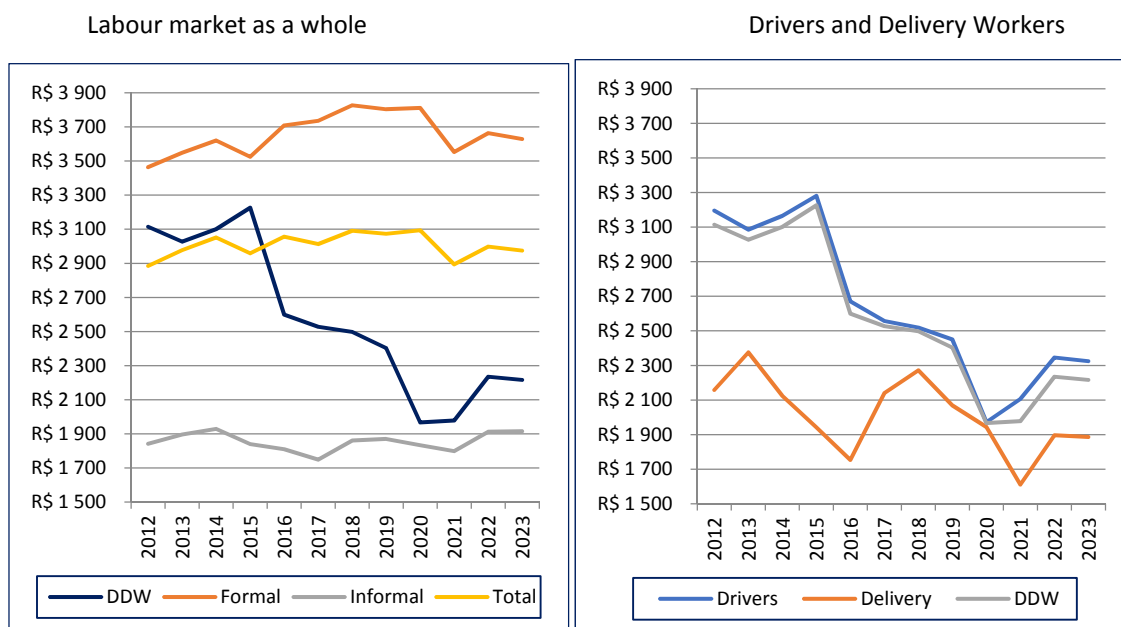
This exceptional dynamism of platform employment raises the question of its possible counterparts. As mentioned above, the literature on platform workers highlights the issue of job insecurity, which is at the heart of the global conversation (Berg et al. 2018; V. De Stefano and Aloisi 2018; Goods, Veen, and Barratt 2019; ILO 2021a; Veen, Barratt, and Goods 2020). Has the creation of platform jobs come at the price of a decline in their quality? As generally acknowledged, job quality depends primarily on earnings.<sup>3</sup> More globally, did the explosion of DDWs result in decreasing earnings due to limited demand, as it would have occurred in a flexible market, or to an increase of platforms' margins as they gain market shares?

Before the emergence of platforms in Brazil, transport own account workers' earnings were 10% to 15% lower than formal workers' earnings but much higher than informal workers' earnings (from 60% to 75%; Figure 3.2). After, the reduction in average earnings was significant and continuous. Between 2015

<sup>3</sup> See a discussion of challenges for measure job quality for platform workers in Gundert and Leschke (2023) and Haidar (2023).

and 2019, real earnings decreased by 25%, while the corresponding figure was stable for informal workers, and formal workers benefitted from an 8% increase. In 2020, the COVID-19 crisis accentuated these dynamics, with a slight recovery afterwards. In 2023, the earnings gap reached -39% compared to formal jobs and +16% with informal jobs. The proliferation of platform corresponds to a huge decline of own account workers' earnings. While they were initially nearer to formal jobs, they came close to informal jobs in the most recent period.

**Figure 3.2: Real earnings by sector 2012-2023 (R\$ 2022)**

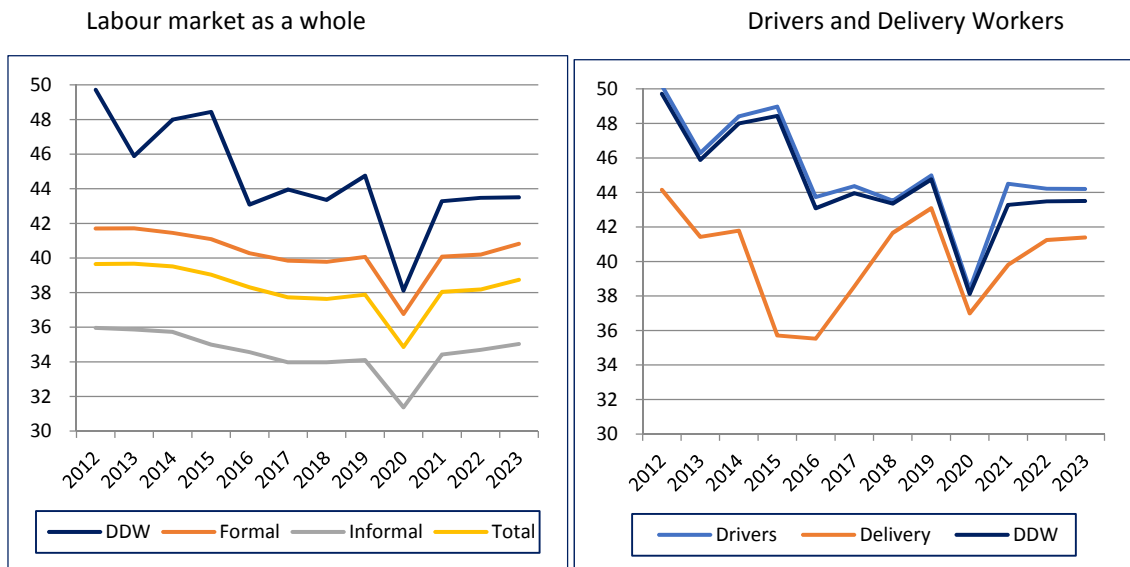


Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

### *Beyond monthly earnings: the long working hours*

However, the above diagnosis is partly misleading. It does not consider the levels and changes in working hours. As shown in [Figure 3.3](#), DDWs have by far the most harassing days, although with a declining trend after 2015. In 2023, they work 44 hours a week, 3 hours more than formal workers and 9 hours more than informal workers. It should be noted that this is a conservative estimate, as part of the hours spent waiting for clients are probably not fully accounted for. Beyond the average, many more domestic workers than their formal and informal counterparts have extreme workloads and work atypical hours. In 2023, 19% of them worked more than 60 hours a week (compared with 5%, respectively), while 15% worked outside the range considered normal (between 5 am and 10 pm), compared with 8% for formal and informal workers. These long working hours not only have an impact on hourly earnings but also on job quality, with adverse consequences (health, etc.).

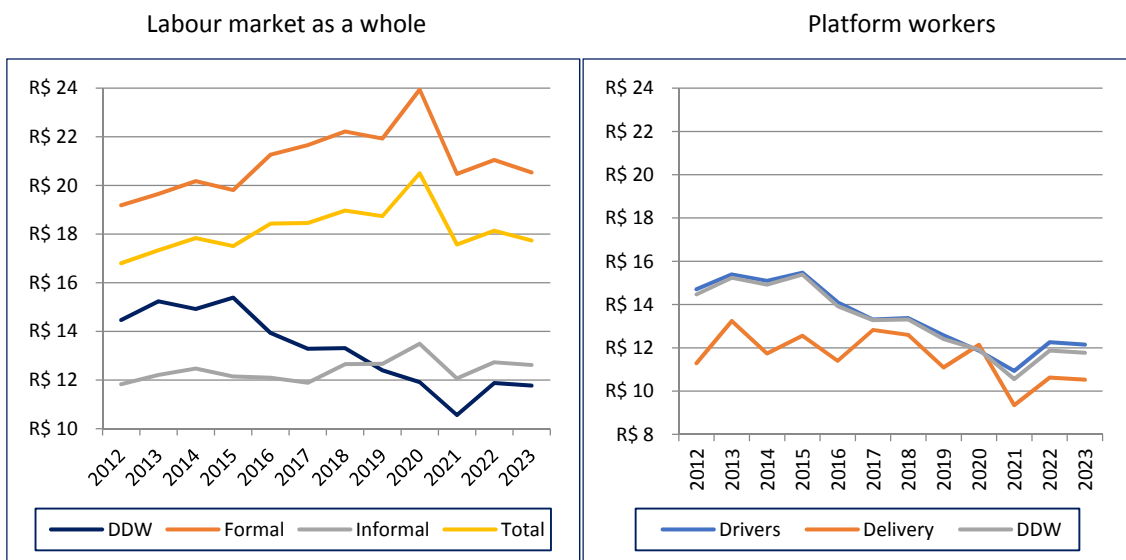
**Figure 3.3: Weekly Hours worked by sector 2012-2023**



Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

When recombined, the real hourly earnings of DDWs show a huge decrease from 2015 onwards (Figure 3.4). Between 2015 and 2023, they lost 19%, while the corresponding figures are +7% for both formal and informal workers, respectively. These regressive dynamics were so huge that since 2019, their real hourly earnings DDWs are lower than those of informal workers and obviously of formal workers, where the gap reaches 7% and 43% respectively, in 2023. Looking at the heterogeneity within platform jobs, delivery workers are at the lower end, which means that their lower monthly earnings are not compensated by their lower working hours. However, the hourly earnings of the two groups are converging, and since 2018, the difference between both is limited.

**Figure 3.4: Hourly earnings by sector 2012-2023 (R\$ 2022)**



Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

### 3.2. workers' characteristics

Workers' characteristics are also at play in earnings level and dynamics. [Table 3.1](#) shows that the socio-demographic structures of employment did not change much over the decade. While the gender distribution is globally balanced in formal and informal jobs, more than 9 out of 10 DDWs are male (up to 96% in 2020). Although the flexible schedule of platform labour could favor the insertion of women, DD jobs are male-dominated territories in the platform economy. Specific in-depth analyses are necessary to investigate the reason for this low percentage of female workers in this sector.

Like gender, race distribution confirms that DDWs do not concentrate the most vulnerable groups as an intersectional approach would have suggested. A little more than half of platform jobs are held by non-white workers. This proportion tends to increase first slowly up to 2021 (53%), then more quickly (55% in 2022), followed by a sharp increase in 2023 (61%). Globally over the period, non-white workers are less segregated than in informal jobs, while they account for 50% in formal jobs. At odds with what can be observed in many industrialized countries, where platform workers are exclusively or massively composed of ethnic minorities and migrants, such is not the case in Brazil. For instance, Bernard (2023), who studied Uber drivers in 3 big cities (Paris, London, and Montreal), concludes that the Uberization process corresponds to the emergence of a new “racial Platform capitalism”, as quoted by Gebrial (2024). Furthermore, she points out the progressive increase of marginalized populations among Uber drivers once the Platform gets sufficient market power to increase its economic margin at the expense of drivers' earnings. In Brazilian cities, the racial component of DDWs is much less at stake, which does not mean it will not occur in the future, as observed since 2022.

In this context of global stability (gender and race), two related socio-demographic characteristics present substantial changes specific to DDWs. First, DD jobs seem to attract more young workers. While those aged between 14 and 29 years old before the arrival of the platforms represent around 16% of DDWs in 2014, they are around 25% in 2023. This evolution is specific to platform jobs, as informal jobs did not change their age composition, while formal workers are getting older. However, platform jobs are not a refuge for young workers since they are less numerous than in other segments of the labour market. In parallel with the platform workforce rejuvenation, their level of education increased over time. While more than 40% of DDWs did not attend more than primary education, they are now less than one out of four, much less than in the informal employment (37%). Although the level of education is increasing in all sectors, the trend is more pronounced for DDWs. Finally, in terms of location, DDWs are more concentrated in capital cities than their formal or informal counterparts.

**Table 3.1: Workers' characteristics by sector 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Male</b>												
Formal	58%	58%	57%	57%	57%	56%	56%	56%	57%	56%	56%	57%
Informal	54%	54%	54%	54%	55%	55%	54%	54%	55%	56%	54%	56%
DDW	94%	91%	93%	93%	93%	92%	92%	93%	96%	95%	92%	93%
<b>Non-white</b>												
Formal	45%	46%	46%	46%	47%	48%	49%	49%	48%	49%	49%	50%
Informal	57%	58%	59%	60%	60%	60%	61%	61%	61%	61%	62%	62%
DDW	46%	48%	48%	56%	53%	52%	53%	53%	54%	53%	55%	61%
<b>14-29 years old</b>												
Formal	33%	32%	31%	29%	27%	27%	26%	26%	24%	25%	25%	25%
Informal	34%	33%	33%	32%	31%	31%	31%	31%	29%	30%	31%	30%
DDW	15%	13%	16%	8%	14%	16%	16%	23%	25%	25%	23%	23%

Primary school or less												
Formal	29%	28%	28%	26%	24%	23%	22%	20%	17%	17%	18%	20%
Informal	55%	54%	53%	50%	48%	46%	43%	42%	38%	37%	37%	44%
DDW	47%	45%	41%	42%	38%	30%	28%	23%	24%	27%	23%	24%
States Capital												
Formal	31%	31%	31%	30%	31%	30%	30%	29%	29%	29%	30%	27%
Informal	25%	26%	25%	25%	25%	26%	26%	27%	27%	26%	27%	22%
DDW	38%	41%	44%	42%	44%	48%	45%	45%	46%	46%	44%	40%
Household head												
Formal	47%	47%	48%	48%	48%	47%	47%	45%	47%	46%	44%	46%
Informal	44%	45%	45%	45%	46%	46%	46%	46%	46%	47%	45%	47%
DDW	67%	65%	66%	66%	61%	57%	53%	47%	49%	49%	46%	48%

Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

As regards the place of DDWs in the household economy, before the arrival of the platforms, two out of three DDWs were heads of household, a much higher rate compared with other types of employment. However, this rate has tended to fall steadily since 2015, reaching 46%, similar to those for formal and informal workers. This progressive normalization process does not mean DD jobs are less central to the domestic economy. On the contrary, they continue to make a significant contribution, providing an average of 53% of the total earned income of the households to which they belong in 2023 (Table A3.1 in the Annex). This percentage has remained broadly stable over the last ten years. By comparison, a similar contribution can be noticed regarding formal jobs for their households, a contribution which is significantly higher than those of informal workers (45%).

Consequently, given that the remuneration of domestic workers is essential to the household and that it is falling, the household's per capita income is also falling. It has decreased steadily since the platforms' arrival, and since 2020, it has not differed significantly from that of informal worker households. In terms of poverty, DDW households are the only ones to see their rate increase (except from 2021). Nonetheless, they remain significantly less poor than informal worker households, as inequality is higher among informal workers (Figure A3.1).

## 4. Beyond the big picture

### 4.1 Earnings equations

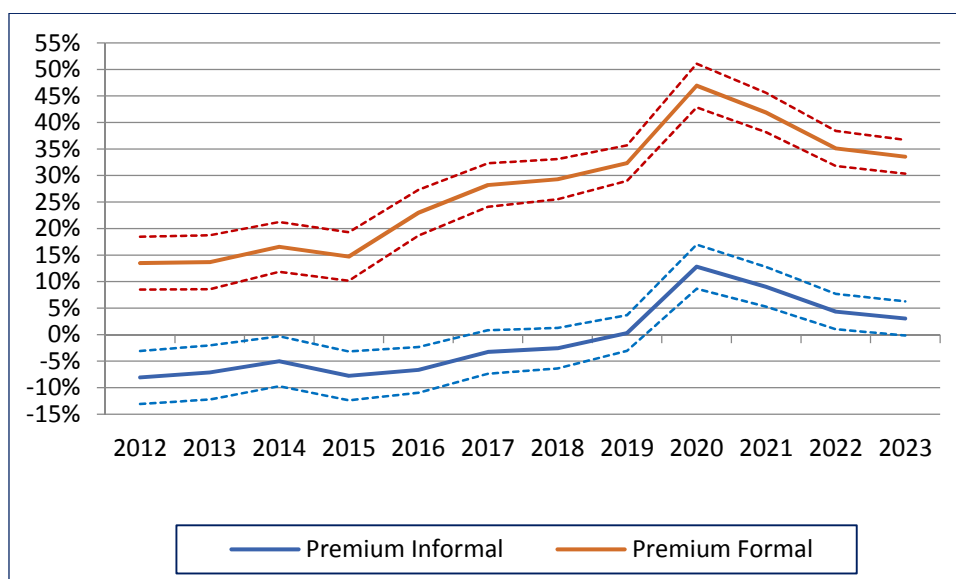
To go beyond the comparison of simple earnings averages, it is necessary to consider differences in the workforce's characteristics to purge composition effects and avoid spurious correlations. For instance, the higher proportion of male and white workers should favor platform workers' earnings compared to informal workers (discrimination effect). Moreover, higher levels of education and age should play in the same direction (productivity effect). To do this, we have estimated earnings equations (*à la Mincer*) controlling for the level of education and potential experience. We add two additional demographic variables (gender and race) to this parsimonious specification, as they are tightly correlated with platform jobs (see below). Our variable of interest is the type of jobs to measure the potential premium or penalty associated with DD jobs, compared to formal and informal jobs. We run the estimations for each year in the period 2012-2023 to assess the evolution over time following the arrival of the Platforms in Brazil.

Overall, the results are in line with the literature in this area.  $R^2$  levels are over 0.30 for each regression, which is quite satisfactory, and the coefficients are all significant and impressively stable over time. For instance, one additional year of schooling brings a 9% increase in hourly earnings (Table A4.1 in Annex). Potential experience (approximated by age) has a classical positive (and concave) effect. Men receive a 26% to 21% premium over women, with a slightly decreasing trend. Non-white workers earn from 19%

to 21% less than their white counterparts, with a slight positive evolution to bridge the gap during the decade.

Turning now to our main concern, formal workers earned, all other things being equal, around 15% more than DDWs before the Platforms arrival (Figure 4.1). Since then (2016), the formal employment premium continuously increased up to 32% in 2019. With the Covid-19 shock the premium reached 47% in 2020, to recede progressively afterward during the recuperation phase, but it remains higher than previous the crisis (34% in 2023). More interestingly, compared to DDWs, informal jobs used to suffer a 5% to 8% penalty in earnings before the Platforms arrival. However, this penalty vanished from 2016 onwards. It even got a premium reaching a maximum of 13% in 2020, the first year of the Covid-19 crisis. As for formal jobs, the premium receded during the posterior phase of labour market recuperation, but was still positive and significant, over 3% in 2023. These results confirm that DDWs are not only disadvantaged compared to formal workers, but also compared to informal workers, at least in terms of hourly earnings, and their relative position has continuously deteriorated.

**Figure 4.1: Earnings gap trends by sector 2012-2023**



Source: PNAD Contínua, 2012-2023, urban area, IBGE; authors' calculations.

Notes: 5% confidence intervals (in dot line).

The specific results regarding women's earnings deserve to be highlighted. As we saw earlier, globally (and for men), the DDWs' earnings are not different from that of informal workers and are much lower than those of formal workers. However, for women, the DDWs' earnings are higher than that of informal workers (+13%) and lower than that of formal ones, but with a much lower premium for women formal workers compared to their male counterparts (15%) in 2023 (Table A4.2 in Annex). Even more interesting, among DDWs, women's hourly earnings are not different from that of men: there is no gender gap, whereas it is around 20% lower in both formal and informal jobs. So, women are still very much in the minority in this type of job. However, their working conditions appear relatively more favourable (especially compared with informal employment). Furthermore, there is no gender-based wage discrimination in this specific DDW sector. These results could be explained by a selection effect: a more in-depth analysis of the profile of women who have decided to work in this sector would shed useful light on these specific results.

## 4.2 Non earnings dimension of job quality

Although central, earnings are not the only factor to consider when assessing job quality. Many other factors must also be considered: social protection, promotion prospects, working conditions (interest and social relations), etc. (Guergoat-Larivière and Marchand 2012). Although limited, the PNAD-C provides some information in this area.

Membership in the social protection system is of prime importance insofar as it covers many risks by giving access to various benefits: sickness, maternity, paid leave, unemployment, and retirement. The level of social protection is, by definition, high in formal employment and marginal in informal employment (100% and 17%, respectively, in 2023; Table 4.1). DDWs occupy an intermediate position between the two, but the introduction of platforms has resulted in a rapid process of informalisation. Before 2015, a little less than half of DDWs were covered by the social benefit system. Eight years later, the proportion was just over one in four (26%), while at the same time, the coverage rate for formal and informal workers remained unchanged. It should be stressed, however, that this figure is greatly overestimated because of the massive (albeit decreasing) presence of taxis not working for platforms. The continuing fall in job protection reflects the growing proportion of App Drivers, who should be massively not covered.

**Table 4.1: Jobs characteristics by sector 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Social security</b>												
Formal	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Informal	13%	14%	15%	15%	16%	15%	15%	15%	15%	15%	15%	17%
DDW	46%	48%	44%	49%	47%	36%	33%	31%	27%	28%	27%	26%
<b>Duration in the job (less than 2 years)</b>												
Formal	32%	32%	31%	29%	26%	26%	26%	27%	26%	27%	30%	30%
Informal	42%	41%	40%	40%	39%	42%	42%	42%	42%	43%	42%	41%
DDW	16%	18%	20%	13%	25%	33%	39%	45%	47%	40%	31%	33%
<b>Time related under-employment</b>												
Formal	2%	2%	2%	1%	1%	2%	2%	2%	2%	3%	2%	1%
Informal	13%	12%	11%	9%	11%	14%	15%	15%	15%	16%	13%	11%
DDW	5%	6%	5%	4%	6%	5%	6%	6%	7%	7%	6%	5%
<b>Hold a Secondary job</b>												
Formal	4%	3%	3%	3%	3%	4%	4%	4%	3%	4%	4%	4%
Informal	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	3%
DDW	3%	2%	2%	2%	1%	2%	3%	3%	2%	3%	4%	3%
<b>% of Secondary jobs (among all jobs)</b>												
Formal	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Informal	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%
DDW	5%	3%	4%	4%	3%	5%	8%	8%	6%	6%	9%	7%
<b>Syndicalization rate</b>												
Formal	22%	21%	20%	21%	19%	19%	17%	15%	n.a.	n.a.	12%	11%
Informal	5%	5%	5%	5%	5%	4%	4%	3%	n.a.	n.a.	3%	3%
DDW	21%	20%	19%	19%	14%	14%	9%	6%	n.a.	n.a.	3%	3%

Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

Note: The data are not available (n.a.) for 2020 and 2021 because of the Covid-19 pandemic.

Two other indicators can be used to assess the quality of platform jobs: firstly, the duration of employment, which may reflect a form of instability, and secondly, time-related underemployment. Historically, self-employment in the transport sector has been particularly stable, with less than 20% of jobs lasting less than 2 years. The arrival of the platforms and the associated growth in DD employment

has automatically resulted in an increase in this rate. Therefore, it is impossible to use this indicator to infer that platform jobs are more precarious or short-term. In contrast, the rate of visible underemployment is more informative. The level is fairly low overall (and even virtually non-existent for formal employment) and the structures are very stable over time, with no notable break with the arrival of the platforms. It varies from 5% to 7% over the period as a whole, which is slightly higher than the rate observed in formal employment but half that for informal employment. This result can be explained by the long working hours of DDWs. It confirms that this type of employment is not a complementary job. Moreover, and in the same vein, a very small proportion (less than 4%) of DDWs have a secondary job, either because they do not have the time or do not need it. Additionally, among all DD jobs, only a small fraction corresponds to secondary jobs (7% in 2023). From a general point of view, the low number of secondary jobs is a characteristic of the Brazilian labour market, whether formal or informal.

Labour platforms often exert significant managerial power, primarily through algorithmic management techniques. By keeping these management systems opaque, platforms create information asymmetries that result in power imbalances, disadvantaging workers. The formation of worker organizations in platform work in response to these imbalances depends on contextual factors, varying from protests with social media campaigns and mass logouts to a lack of significant collective action (Gundert and Leschke 2023). One measure to capture the workers' mobilization level is the unionization rate. In Brazil, the unionization rate is higher for formal and decreases for all segments. However, the drop was much more significant for DDWs, from 21% in 2012 to 3% in 2023, reaching an even slightly inferior level than for informal workers.

### 4.3 Individual job transitions in the labour market

In order to estimate the stability of platform jobs, the computation of individual job transition matrices makes it possible to overcome the limits mentioned above concerning the duration of employment. Taking advantage of the PNAD-C panel structure (each individual is interviewed every quarter during one year), we estimated quarterly transitions by labour market status, distinguishing between 3 types of employment (formal, informal, DDWs) and 3 types of non-employment (unemployed, discouraged, other inactive). The matrices provide an initial overview of those who have maintained their employment status from one period to the next (Table 4.2). Irrespective of the period, formal workers are the most stable (around 85% remain in formal jobs), and informal workers are the ones with the highest turnover (a third of them change status). In this general context, DDWs differ little from informal jobs. However, DDWs are the only ones that have seen a significant change in the rate of job mobility over time if we exclude the exceptional period of the Covid-19 pandemic (2020-2021), which was characterised by a sharp fall in the rate of mobility in all sectors (Bouvier et al. 2022). DD jobs have become increasingly durable.

Beyond the turnover rate, it is nonetheless relevant to question the significance of job durability. The trajectory of individuals needs to be analysed more closely, especially the origin of those who have become DDWs and the destination of those who have left this type of job. The literature raises two main questions that few quantitative analyses address directly. The first concerns the opportunity platform jobs represent for people in precarious situations: the unemployed, young people, or migrants who have difficulty entering the labour market. This seems to be the case in several European countries (Piasna, Zwysen, and Drahokoupil 2022; Urzi Brancati, Pesole, and Fernández-Macías 2020). The low barriers to entry can explain easier access to this type of job (Hoang, Blank, and Quan-Haase 2020). These jobs require little social or material capital, and their flexible working hours enable managing various family constraints or finding other income sources (Lam and Triandafyllidou 2021).

The second question concerns the nature of platform jobs: Do they serve as a stepping stone, an access gate, to better quality formal jobs, or do they constitute jobs whose status replaces the formal one? In other words, are they an intermediate step in an individual's career path or a permanent status? Some



studies emphasize that the experience gained and networks developed in platform jobs could be used to access other types of jobs (Idowu and Elbanna 2022). Other studies emphasize the permanent nature of platform jobs. With their standardisation, the notion of "sticky labour" (Sun, Yujie Chen, and Rani 2023) is invoked to explain the paradoxical phenomenon that those who arrive stay and even invest themselves fully with high hourly workloads despite difficult conditions.

To study the extent to which these hypotheses apply in the case of Brazil, the analysis of the transition matrices provides some enlightening results. Firstly, regarding the origin of DDWs (Table A4.3 in Annex), only 2% to 6% (depending on the year) came from unemployment in the previous quarter. If we consider only movers, this proportion rises steadily from around 5% before the arrival of the platforms to 18% (in 2019). Actually, over 90% were already in employment. Therefore, unemployment, or inactivity, is not the primary origin of platform workers.

Furthermore, in relative terms, they were much more likely to be previously employed than informal workers (67% vs. 41%). As a result, DD jobs are not primarily fuelled by unemployment. However, they are becoming increasingly so as platforms enable a growing number of unemployed people to find work. While the probability of being unemployed was of the same order of magnitude as that of formal workers before 2016, it has become 2 to 3 times higher in recent years. Symmetrically, the probability of being unemployed was 2 times lower than that of informal workers before 2016. Today, it is similar.

Next, what happened to the DDWs who left this sector? Most of them have remained in employment (73% in 2023), mainly informal (46% vs. 27% in formal employment in 2023). Their informal counterparts are much less likely to have kept a job (45% in 2023), as are formal workers, although the gap is less pronounced (68%). Consequently, for those who change sectors, DD jobs represent a greater guarantee of job preservation than other segments of the labour market. However, this relative advantage has tended to erode with the rise of platforms in the Brazilian labour market. If we now take into account all workers ((those who have stayed and those who have changed sectors), the rate of those who remain in the same sector of employment from one quarter to the next is of the same order for DDWs and formal workers (over 90%), and higher than for informal workers (just over 80%).

Calculating relative probabilities provides an order of magnitude of the dynamics at work (Table 4.2). Thus, DDWs are less likely than informal workers to enter formal employment, and this phenomenon increases over time (from -21% in 2015 to -40% in 2023). The argument that platform work is a stepping stone to formal employment is invalidated. Conversely, they are more likely than formal workers to enter informal employment (+35% in 2023), although no clear trend emerges. Finally, they are more likely than formal workers to become unemployed (+104% in 2023), and the ratio is increasing, but less so than informal workers, although the gap is narrowing (-18% in 2023).

**Table 4.2: Jobs transitions by sector 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Job transitions: Stayers (keep the job between two quarters)</b>												
DDW	64%	58%	58%	70%	69%	69%	72%	72%	76%	84%	67%	69%
Informal	71%	70%	71%	69%	66%	68%	69%	69%	80%	87%	67%	68%
Formal	85%	84%	85%	85%	84%	85%	85%	85%	92%	95%	83%	84%
<i>Ratio DDW/I</i>	<i>0,90</i>	<i>0,83</i>	<i>0,82</i>	<i>1,01</i>	<i>1,05</i>	<i>1,01</i>	<i>1,04</i>	<i>1,04</i>	<i>0,95</i>	<i>0,97</i>	<i>1,00</i>	<i>1,01</i>
<i>Ratio DDW/F</i>	<i>0,75</i>	<i>0,69</i>	<i>0,68</i>	<i>0,82</i>	<i>0,82</i>	<i>0,81</i>	<i>0,85</i>	<i>0,85</i>	<i>0,83</i>	<i>0,88</i>	<i>0,81</i>	<i>0,82</i>
<b>Probability to remain in employment (movers + stayers)</b>												
DDW	94%	94%	94%	94%	93%	92%	91%	92%	85%	95%	91%	92%
Informal	83%	83%	84%	82%	80%	81%	82%	82%	84%	91%	81%	83%
Formal	95%	94%	95%	94%	94%	95%	95%	95%	94%	97%	95%	95%
<i>Ratio DDW/I</i>	<i>1,13</i>	<i>1,13</i>	<i>1,12</i>	<i>1,14</i>	<i>1,17</i>	<i>1,13</i>	<i>1,11</i>	<i>1,12</i>	<i>1,02</i>	<i>1,05</i>	<i>1,12</i>	<i>1,11</i>
<i>Ratio DDW/F</i>	<i>0,99</i>	<i>0,99</i>	<i>0,99</i>	<i>0,99</i>	<i>0,99</i>	<i>0,97</i>	<i>0,96</i>	<i>0,97</i>	<i>0,90</i>	<i>0,98</i>	<i>0,96</i>	<i>0,97</i>
<b>Probability to remain employed (movers)</b>												

DDW	84%	85%	81%	79%	77%	73%	66%	71%	38%	68%	73%	73%
Informal	42%	44%	42%	42%	40%	40%	40%	41%	20%	31%	43%	45%
Formal	64%	64%	64%	63%	62%	64%	65%	67%	33%	48%	68%	68%
<i>Ratio DDW/I</i>	<i>1,97</i>	<i>1,93</i>	<i>1,90</i>	<i>1,87</i>	<i>1,93</i>	<i>1,81</i>	<i>1,64</i>	<i>1,72</i>	<i>1,85</i>	<i>2,22</i>	<i>1,67</i>	<i>1,61</i>
<i>Ratio DDW/F</i>	<i>1,30</i>	<i>1,33</i>	<i>1,26</i>	<i>1,26</i>	<i>1,24</i>	<i>1,14</i>	<i>1,02</i>	<i>1,06</i>	<i>1,13</i>	<i>1,43</i>	<i>1,07</i>	<i>1,08</i>
<b>Probability of becoming formal workers</b>												
DDW	11%	13%	10%	10%	9%	7%	7%	8%	4%	4%	9%	8%
Informal	12%	13%	13%	13%	13%	13%	12%	12%	4%	4%	14%	14%
<i>Ratio DDW/I</i>	<i>0,90</i>	<i>0,98</i>	<i>0,77</i>	<i>0,79</i>	<i>0,70</i>	<i>0,59</i>	<i>0,54</i>	<i>0,62</i>	<i>0,97</i>	<i>1,05</i>	<i>0,63</i>	<i>0,60</i>
<b>Probability of becoming informal workers</b>												
DDW	20%	23%	16%	13%	15%	15%	12%	12%	5%	7%	15%	14%
Formal	10%	10%	10%	9%	10%	10%	9%	10%	3%	2%	11%	10%
<i>Ratio DDW/F</i>	<i>1,95</i>	<i>2,23</i>	<i>1,63</i>	<i>1,41</i>	<i>1,47</i>	<i>1,58</i>	<i>1,26</i>	<i>1,22</i>	<i>1,89</i>	<i>2,77</i>	<i>1,35</i>	<i>1,35</i>
<b>Probability of becoming unemployed</b>												
DDW	1%	1%	1%	2%	3%	4%	4%	4%	5%	2%	3%	3%
Informal	3%	3%	3%	3%	5%	5%	5%	5%	4%	3%	4%	3%
Formal	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	2%	1%
<i>Ratio DDW/I</i>	<i>0,48</i>	<i>0,51</i>	<i>0,40</i>	<i>0,67</i>	<i>0,50</i>	<i>0,68</i>	<i>0,88</i>	<i>0,76</i>	<i>1,08</i>	<i>0,84</i>	<i>0,81</i>	<i>0,82</i>
<i>Ratio DDW/F</i>	<i>0,84</i>	<i>0,84</i>	<i>0,70</i>	<i>0,98</i>	<i>1,15</i>	<i>1,78</i>	<i>2,45</i>	<i>2,15</i>	<i>2,65</i>	<i>2,23</i>	<i>2,01</i>	<i>2,04</i>

Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

## 5. The Drivers and Delivery Workers in the 'job space': a synthetic approach

To go beyond the univariate (time series), bivariate (unconditional correlations), or econometric (conditional correlations) approaches that we have adopted so far, multidimensional factor analysis techniques offer many advantages (Lebart, Morineau, and Piron 2000). Firstly, from an analytical point of view, it is perfectly suited to the research question posed in this article: Are the nature of DD jobs closer to formal or informal jobs, or do they constitute a new type of job? Secondly, from a methodological point of view, it makes it possible to go beyond the limits of the results obtained so far, both by considering a larger number of variables characterising the jobs and by refraining from the parametric hypotheses necessary for econometric estimates. In short, through the multiple correlations of all the relevant job dimensions, the aim is to reveal the underlying structures of the Brazilian labour market and to place the jobs performed by DDWs in a holistic perspective. To do this, we used the classic techniques of multiple component analysis (MCA), which is best suited to the nature of our data.

The first stage consists of constructing *the "jobs space"* by selecting all the variables available in the PNAD-C which characterise the nature of the jobs: earnings, of course, but also working hours and underemployment, multiple job-holding, social protection, duration of employment, size of establishment and type of premises (see the exhaustive list of variables in the Annex). The second stage consists of projecting our main variables of interest, namely DD jobs, as supplementary variables, which, therefore, do not contribute to the construction of the jobs space and whose positions in the space are compared with those of formal and informal jobs. We also projected workers' socio-demographic characteristics onto the jobs' space. We first present the results for 2023, the latest year for which data is available. We focus our analyses on the first factorial plane (Axes 1 and 2), which structures the job space in Brazil (18% of total inertia, i.e. 12% for axis 1 and 6% for axis 2; [Figure 5.1](#)).

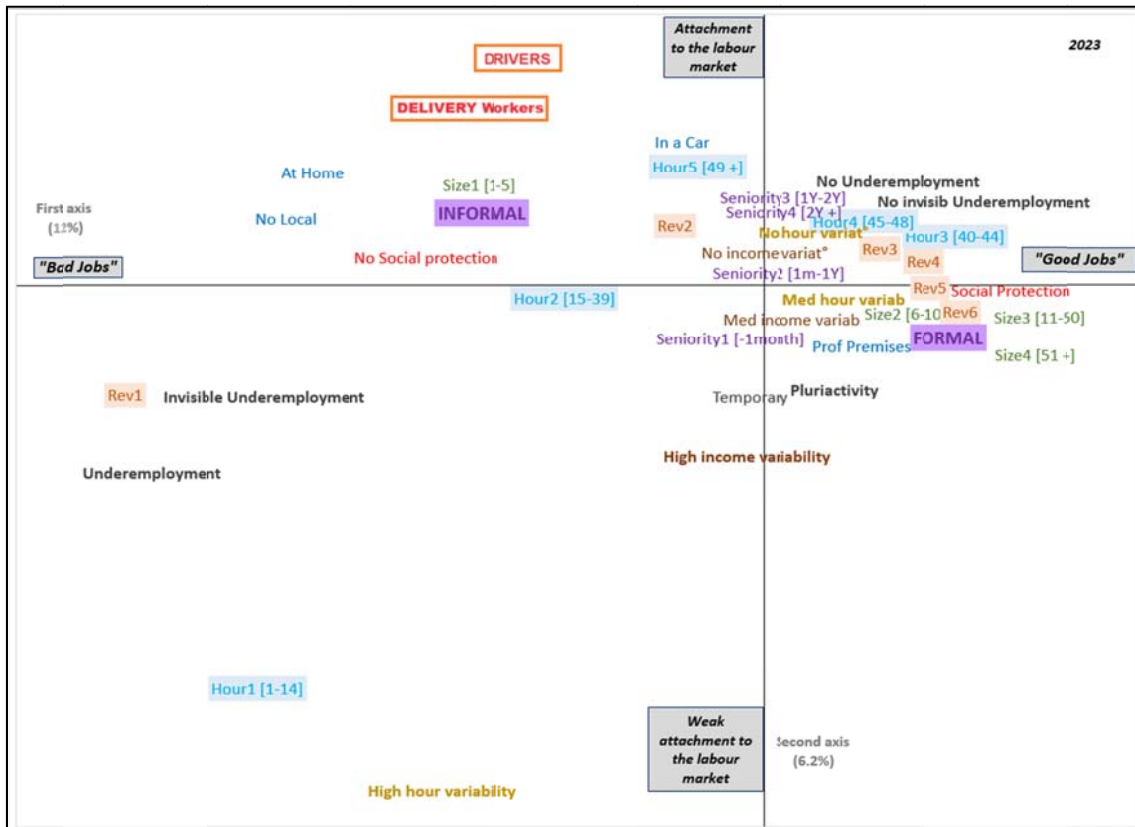
The first factorial plane is particularly explicit. Axis 1, which largely dominates the job space, contrasts "good jobs" with "bad jobs". The jobs are ordered almost linearly according to their quality: on one side are the lowest-paid jobs with no social protection. They are carried out in small establishments and

most often without business premises (at home or in the street). Moving along Axis 1, the job quality gradually improves, as can be seen, for example, from the income variable, which runs in order along the axis until, at the other end of the axis, we find the best-paid jobs, protected in every respect: social protection and material conditions in which the jobs are carried out. A direct consequence of the previous observation is that jobs combine all the properties of quality, good or bad. There is, therefore, no trade-off between earnings and social protection, which workers would choose according to their individual preferences.

Axis 2 characterises labour market attachment by contrasting jobs with the weakest ties to the labour market (underemployment, very low hours and low earnings, temporary contracts, low length of employment) and high variability in hours and labour income, with more 'established' and stable jobs showing greater integration into the labour market. This does not mean that the latter are necessarily of better quality. For example, on the one hand, there are jobs with low working hours (less than 15 hours a week) and on the other, jobs with very long working hours (more than 48 hours a week). In both cases, the jobs in question are inadequate and correspond to a specific form of underemployment: linked to working hours (often qualified as "visible" underemployment) on the one hand and due to low productivity on the other ("invisible" underemployment).

In this general configuration, everything pits formal jobs against informal jobs. When the informality variables are projected onto the 1<sup>st</sup> factorial plane/space, the first important result is that the formal jobs/informal jobs partition is relevant despite their potential internal heterogeneity. Informal jobs are globally associated with "bad jobs", and formal jobs with "good jobs". It should be remembered that this result is not tautological since the formal or informal nature of jobs does not play a part in the construction of the job space.

Figure 5.1 Formal, Informal and DDWs in the 'jobs space' in 2023



Source: PNAD Contínua, 2023, urban area, IBGE; authors' calculations.

Once the general structure of the urban employment space in Brazil has been established, the question that interests us here is the specific place occupied by DDWs. Two main results are worth highlighting. Firstly, in the job space, DD jobs are much closer to informal jobs than to formal jobs. This is true for both drivers and delivery drivers/riders, whose position is very close. This shows that despite their differences, on the scale of the labour market as a whole, their heterogeneity is of the second order, justifying the legitimacy of treating them as a specific group. This result confirms those obtained previously. Like informal jobs, DDWs are more on the "bad" side of Axis 1 than the "good" side. However, they differ from the former in two ways. Firstly, they are not among the worst off, particularly in terms of earnings. Secondly, they are, in part, "new type" jobs. They are at one of the extremes of Axis 2, on the side of jobs characterised by strong ties to the labour market, with a very heavy hourly workload, few temporary jobs, little recourse to multi-activity, low variability of earnings and working hours over time.

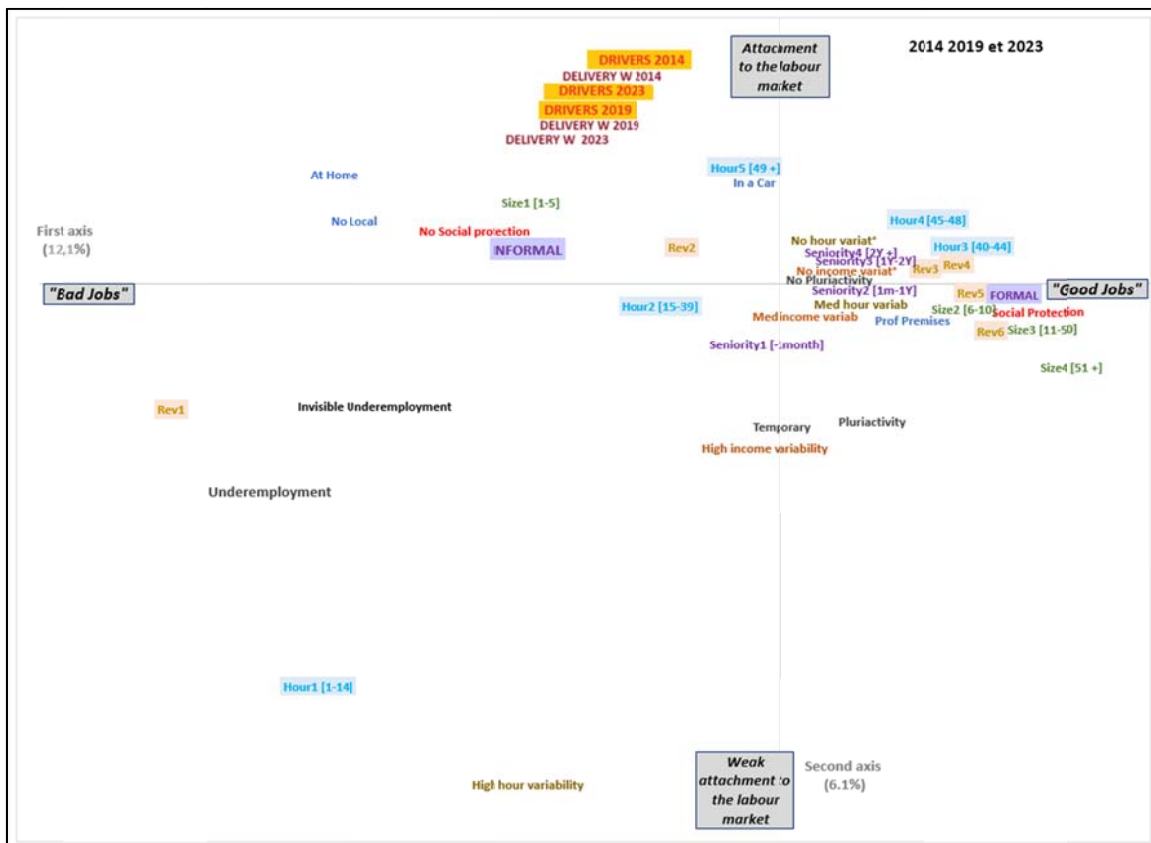
All the socio-demographic characteristics projected onto the job space are close to the barycentre, which means that no category of the population is exclusively confined to a particular type of job (Figure A5.1 in the Annex). In other words, there is no occupational segregation in a strict sense since all population groups (in terms of gender, age, or skin colour) can be found in each type of job. This does not prevent their unequal distribution (for example, the over-representation of men among DDWs), particularly in terms of "good" and "bad" jobs, nor does it rule out the existence of discrimination. The only exception to this result is the level of education. The latter is highly correlated with job quality (Axis 1). From this point of view, DDWs suffer from their low level of education, even though they are better endowed with educational capital than the average informal job.

To complete these overall analyses, we sought to answer two more questions: is the job space specific to DDWs structured in the same way as the overall space of jobs? How has the relative position of DD jobs changed over time? So, like a photographer seeking to document a phenomenon as well as possible, we propose two camera movement techniques after a panoramic view: the first zooms in on the DDWs world, the second tracks the DDWs over time.

To answer the first question, which seeks to assess internal heterogeneity within DDWs, we have used the same job characteristic variables and adopted the same methodology. Overall, the topology of the DD job space is not fundamentally different from the labour market as a whole job space, of which it constitutes a miniature replica (Figure A5.2). This highlights the profound nature of the Brazilian labour market structure. At the margin, DD jobs appear less polarised and more homogeneous than jobs overall, as shown by the smaller share of total inertia "explained" by the 1<sup>st</sup> factorial plane. Furthermore, in this space, drivers' jobs are not very different from those of delivery drivers. The internal heterogeneity of these two groups of workers regarding job quality is similar.

To answer the second question, we proceeded in two stages. First, we constructed the jobs space for the year 2014, i.e. before the arrival of the platforms, using the same methodology (Figure A5.3). The structure of the jobs space is surprisingly close to that of 2023 (and indeed of all the years since 2012). There has, therefore, been no real structural transformation of the labour market over the last decade. As a corollary, the emergence of platforms has not led to a profound change in the job space in Brazil. This is partly because the corresponding jobs are still few in number (less than 2%), but also because they are not fundamentally different from other jobs that already existed before the arrival of platforms. Secondly, insofar as the configuration of jobs has remained the same over the last ten years, we have constructed a global jobs space covering the entire period by pooling data from three years (2014, 2019 and 2023). Figure 5.2 shows that the arrival of the platforms has been accompanied by a slow drift of DD jobs towards lower-quality jobs, bringing them closer to informal jobs.

Figure 5.2 Evolution of the DDWs in the 'jobs space' over time (2014-2023)



Source: PNAD Contínua, 2014, 2019, 2023, urban area, IBGE; authors' calculations.

Three major results are worth highlighting at the end of this series of multivariate factor analyses. Firstly, it is clear that, contrary to what many studies generally assert for platform jobs (Schor et al. 2020), DD jobs in Brazil do not fall into the category of activities carried out on a secondary basis and serve as supplementary income for individuals and households. For the vast majority of DDWs, this job is their main activity, and they are deeply anchored in the labour market.

Secondly, contrary to the idea that there is a great deal of heterogeneity among platform workers (Berg et al. 2018; Schor et al. 2020; S. Vallas and Schor 2020), we find a great deal of internal homogeneity among DDWs in Brazil. However, this finding probably stems from the fact that we have only looked at a very specific segment here: those in the transport sector among the "location-based" digital labour platforms that direct workers to deliver local services. In any case, our study tends to invalidate the idea that this sector brings together a multitude of highly differentiated profiles.

Finally, this approach, which provides a summary of changes in all the characteristics of DD jobs relative to those of the labour market as a whole, confirms and reinforces the results observed in the previous sections. First, DDWs work in precarious conditions, bringing them closer to the informal sector. However, beyond the big picture, we show above all that their conditions are deteriorating over time, which is taking place in a context of great inertia in the structure of the labour market. In their seminal article reviewing the literature, Vallas and Schor (2020) invoke four metaphors to give a typology of platform jobs: the entrepreneurial incubator, the digital cage, an accelerant of precariousness, and the firm as chameleon. Our analysis tends to classify DD jobs as "accelerators of precarity".

## 6. Conclusion

This article aimed to measure and analyse the phenomenon of platformisation, focusing on the transport sector where it is most visible, with drivers and delivery workers. From a methodological point of view, despite the limitations of our approach, the article has provided a measure of the scale and changes in this phenomenon over a long period. Such a time-tracking approach is the best way of understanding any structural transformations that may occur with the arrival of a new type of employment, the shifting dynamics of which are difficult to grasp using traditional surveys and concepts.

From an analytical point of view, the first conclusion is that platform work has been a formidable job creator in the Brazilian labour market. The approach adopted here (labour supply) and the measurement problems do not allow us to know whether a substitution phenomenon is at work. However, they have clearly created a new demand.

A more general implication is that technological change and digitalisation are not only linked to a process of relocation of jobs from the South to the North but also constitute an opportunity for job creation in the South. Secondly, the jobs created are undoubtedly not of high quality, but on average, they are better than informal jobs, even if they have tended to become more so over the past decade. Unlike in Northern countries, where platform jobs are often occupied by a low-skilled, racialized workforce on the margins of the labour market and, therefore, potentially subject to segregation and discrimination, in Brazil, they affect all kinds of people who are better integrated into the productive fabric. They are in an intermediate position, in the middle of the employment hierarchy. Under these conditions, promoting this type of employment may prove to be an important strategy in terms of public policy. Nevertheless, the quality of platform jobs is low.

DDWs are poorly paid, have gruelling working days, are largely unprotected and take on all the risks associated with their job. As employment has grown, working conditions have tended to deteriorate relative to other segments of the labour market over time. From this point of view, it is imperative to improve their quality. This means recognising the legal status of this type of employment, between salaried jobs and self-employment, and their rights. The task is proving complicated, and not just in Brazil, since it involves combining maintaining a certain form of autonomy and flexibility in employment with the protection of workers. The Brazilian government is currently considering this issue. Nevertheless, the objective is clear: to bring platform jobs closer to the quality of formal jobs, rather than contributing to the informalization of the labour market. This trend has been underway since the introduction of platforms in the country. The question of the level of remuneration, which is becoming less and less attractive, is also at the heart of the debate. A better division of value between pay and profit, between companies and workers, must be promoted. A rebalancing of power between platform workers on the one hand and the state and companies on the other, which is currently largely to the disadvantage of the former, is necessary (whether by law or negotiation). Organising platform workers, who are currently fragmented, into trade unions or associations would be one of the levers that could be activated to improve their working conditions.

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## ANNEX

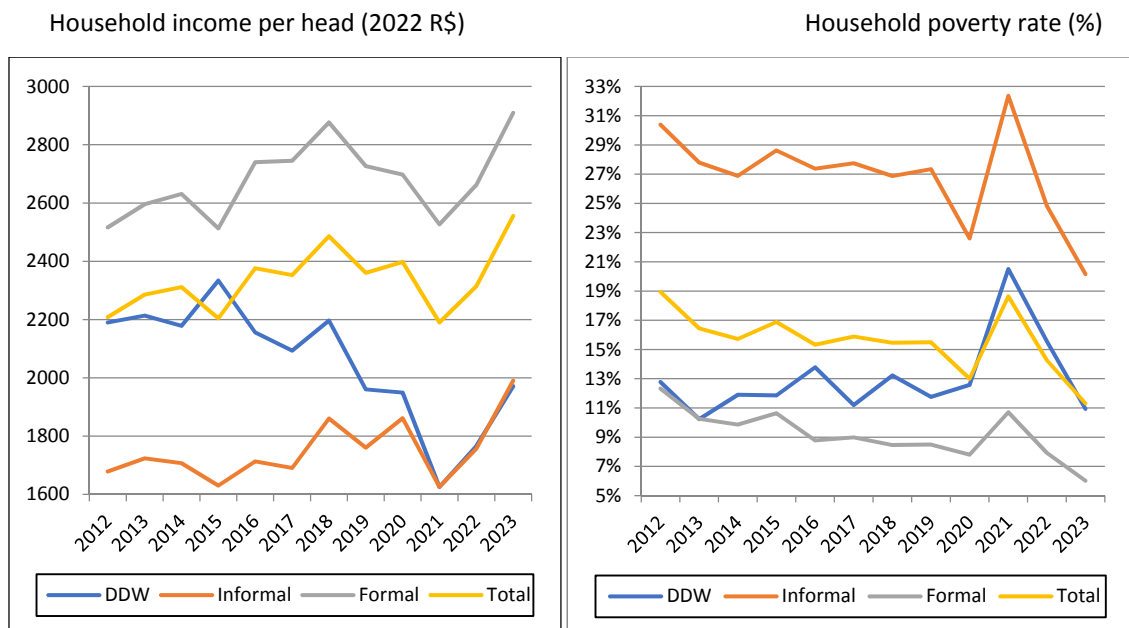
**Table A3.1: Contribution of DDWs earnings to household labour income by sector 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Formal	57%	54%	58%	59%	56%	52%	49%	53%	49%	51%	53%	53%
Informal	41%	41%	42%	43%	43%	42%	43%	43%	44%	46%	44%	45%
DDW	51%	52%	52%	53%	53%	54%	54%	54%	56%	55%	54%	53%

Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

Note: in 2023, the DDWs provided 53% of the labour income of their household.

**Figure A3.1 : Household income and Poverty by sector 2012-2023**



Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

**Table A4.1: Earnings gap by sector 2019-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Sector (reference: DDW)</b>												
Formal	0.135 ***	0.136 ***	0.165 ***	0.147 ***	0.230 ***	0.282 ***	0.293 ***	0.323 ***	0.469 ***	0.419 ***	0.351 ***	0.335 ***
Informal	-0.081 **	-0.071 **	-0.050 *	-0.078 ***	-0.066 **	-0.033 -	-0.026 -	0.003 -	0.128 ***	0.090 ***	0.043 **	0.031 *
<b>Controls</b>												
Male	0.260 ***	0.266 ***	0.263 ***	0.245 ***	0.227 ***	0.224 ***	0.228 ***	0.220 ***	0.212 ***	0.209 ***	0.219 ***	0.205 ***
Age	0.048 ***	0.045 ***	0.045 ***	0.044 ***	0.041 ***	0.039 ***	0.042 ***	0.039 ***	0.041 ***	0.035 ***	0.034 ***	0.033 ***
Age <sup>2</sup>	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***
Schooling	0.091 ***	0.089 ***	0.090 ***	0.089 ***	0.086 ***	0.090 ***	0.095 ***	0.096 ***	0.100 ***	0.092 ***	0.089 ***	0.090 ***
Non white	-0.189 ***	-0.190 ***	-0.185 ***	-0.185 ***	-0.193 ***	-0.187 ***	-0.192 ***	-0.201 ***	-0.200 ***	-0.200 ***	-0.207 ***	-0.210 ***
R <sup>2</sup>	0.31	0.31	0.33	0.32	0.33	0.32	0.32	0.34	0.33	0.32	0.30	0.30
Obs	139,772	143,835	145,118	141,663	138,823	136,553	135,943	130,532	96,346	97,592	116,606	121,906

Sources: PNAD-C 2012-2021, IBGE; authors' calculations. \*\*\*: p<0.001; \*\*: p>0.01; \*: p<0.05.

**Table A4.2: Earnings gap among women by sector 2023**

	Among women 2023	Among DDWs 2023	Among informal 2023	Among formal 2023
Sector (reference: DDWs)				
Formal	0.154**			
Informal	-0.137*			
Male	<i>(Among women)</i>	-0.050	0.189***	0.217***
Age	0.028***	0.010	0.029***	0.035***
Age <sup>2</sup>	-0.0002***	-0.0000	-0.0002**	-0.0002***
Schooling	0.094***	0.037***	0.081***	0.097***
Non-white	-0.207***	-0.127***	-0.127***	-0.192***
R <sup>2</sup>	0.287	0.058	0.187	0.275
Obs	55,214	1,969	46,703	73,234

Sources: PNAD-C 2023, IBGE; authors' calculations. \*\*\*: p<0.001; \*\*: p>0.01; \*: p<0.05.

**Table A4.3: Transition matrix by origin - 2012-2023**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Origin of DDWs</b>												
Platform	63,4%	60,6%	65,4%	68,1%	65,3%	64,8%	68,6%	68,2%	79,3%	81,9%	64,8%	68,4%
Formal	10,6%	12,6%	9,8%	9,9%	11,2%	9,5%	7,7%	7,7%	4,3%	3,9%	9,0%	8,0%
Informal	19,4%	20,8%	18,3%	15,0%	14,4%	16,2%	13,4%	13,5%	7,0%	7,1%	15,3%	13,1%
Unemployed	1,5%	2,0%	1,8%	2,0%	4,1%	5,1%	5,4%	5,8%	4,8%	4,0%	4,9%	4,1%
Discouraged	1,1%	1,4%	1,2%	1,1%	0,9%	1,2%	1,3%	1,4%	2,4%	1,7%	2,3%	1,5%
Inactive	4,0%	2,8%	3,5%	3,8%	4,1%	3,2%	3,6%	3,4%	2,2%	1,4%	3,6%	4,9%
<b>Origin of formal workers</b>												
Platform	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,2%	0,2%
Formal	84,1%	83,2%	84,3%	84,5%	84,1%	84,7%	85,0%	84,9%	93,8%	93,5%	82,5%	83,9%
Informal	10,6%	11,3%	10,6%	10,5%	10,7%	10,2%	10,3%	10,5%	3,1%	3,2%	11,9%	11,3%
Unemployed	1,9%	2,0%	1,7%	1,8%	2,0%	2,2%	2,0%	2,0%	1,2%	1,5%	2,0%	1,5%
Discouraged	0,7%	0,6%	0,5%	0,5%	0,5%	0,6%	0,6%	0,6%	0,7%	0,6%	0,8%	0,6%
Inactive	2,6%	2,8%	2,8%	2,6%	2,6%	2,2%	2,0%	1,8%	1,0%	1,1%	2,6%	2,4%
<b>Origin of informal workers</b>												
Platform	0,2%	0,2%	0,1%	0,1%	0,2%	0,2%	0,2%	0,2%	0,1%	0,1%	0,4%	0,4%
Formal	10,9%	11,6%	11,5%	11,7%	12,7%	11,6%	11,2%	11,4%	3,8%	2,8%	12,9%	12,8%
Informal	70,6%	69,5%	70,4%	70,0%	67,0%	67,3%	68,6%	68,9%	83,8%	85,2%	66,1%	68,1%
Unemployed	3,6%	3,8%	3,4%	4,1%	5,4%	6,5%	6,1%	5,9%	3,9%	4,1%	5,3%	4,2%
Discouraged	4,0%	3,8%	3,4%	3,5%	4,1%	4,7%	5,0%	5,1%	4,2%	3,5%	5,1%	4,4%
Inactive	10,7%	11,1%	11,1%	10,7%	10,6%	9,8%	9,0%	8,5%	4,2%	4,3%	10,3%	10,2%

Sources: PNAD-C 2012-2023, IBGE; authors' calculations.

## List of variables for the Multiple Correspondance Analysis (MCA)

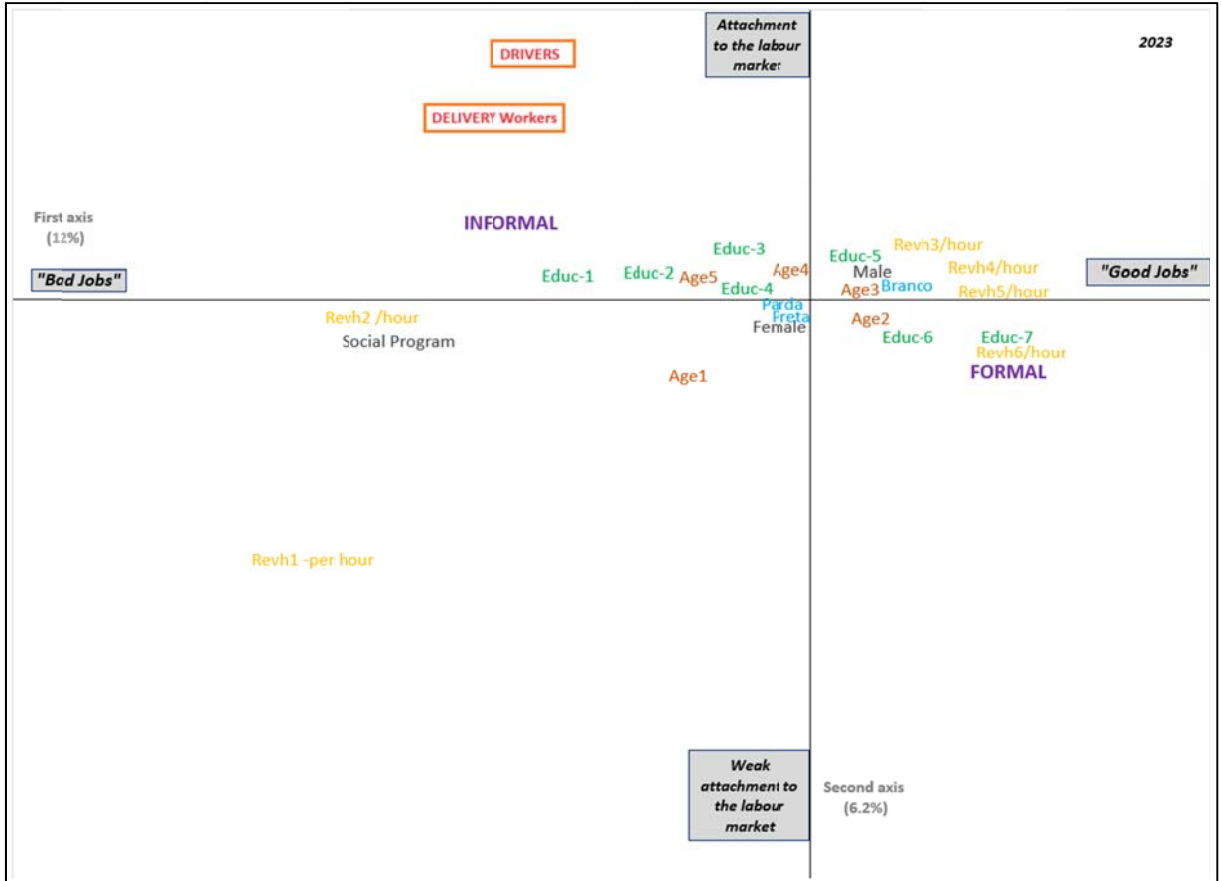
### **Principal variables**

Underemployment (Yes/No)  
 Invisible Underemployment  
 Social Protection  
 Pluri-activity  
 Size (size of the establishment or production unit)  
 Hour (number of working hours)  
 Earnings or income (6 categories: Rev1-Rev6)  
 Premises (Professional; At Home/car ; No Local)  
 Seniority (duration of employment: months or years)  
 Variability of the number of hours (No/Medium/High)  
 Variability of earnings/income (No/Medium/High)  
 Temporary work (yes/no)

### **Supplementary variables**

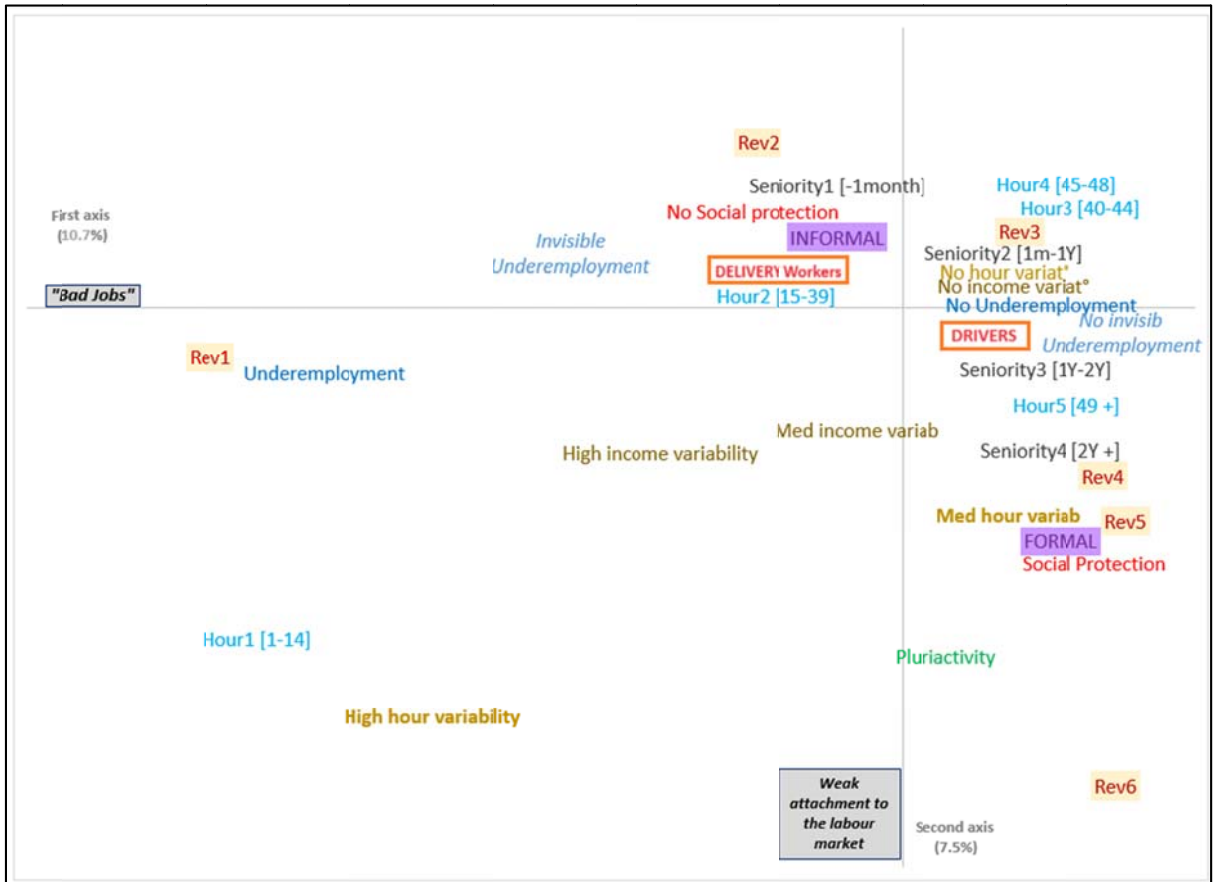
Sex: Male / Female  
 Race/Color: White, Non-White (Preta, Parda, other)  
 Education (number of years in 7 categories)  
 Age (number of years in 5 categories)  
 Status in the household (head, spouse or husband, child ..)  
 Hourly earnings (6 categories: Revh1-Revh6)  
 Formal employment  
 Informal employment  
 Benefit Social Program  
 Drivers  
 Delivery workers

Figure A5.1 Socio-demographic characteristics in the 'jobs space'



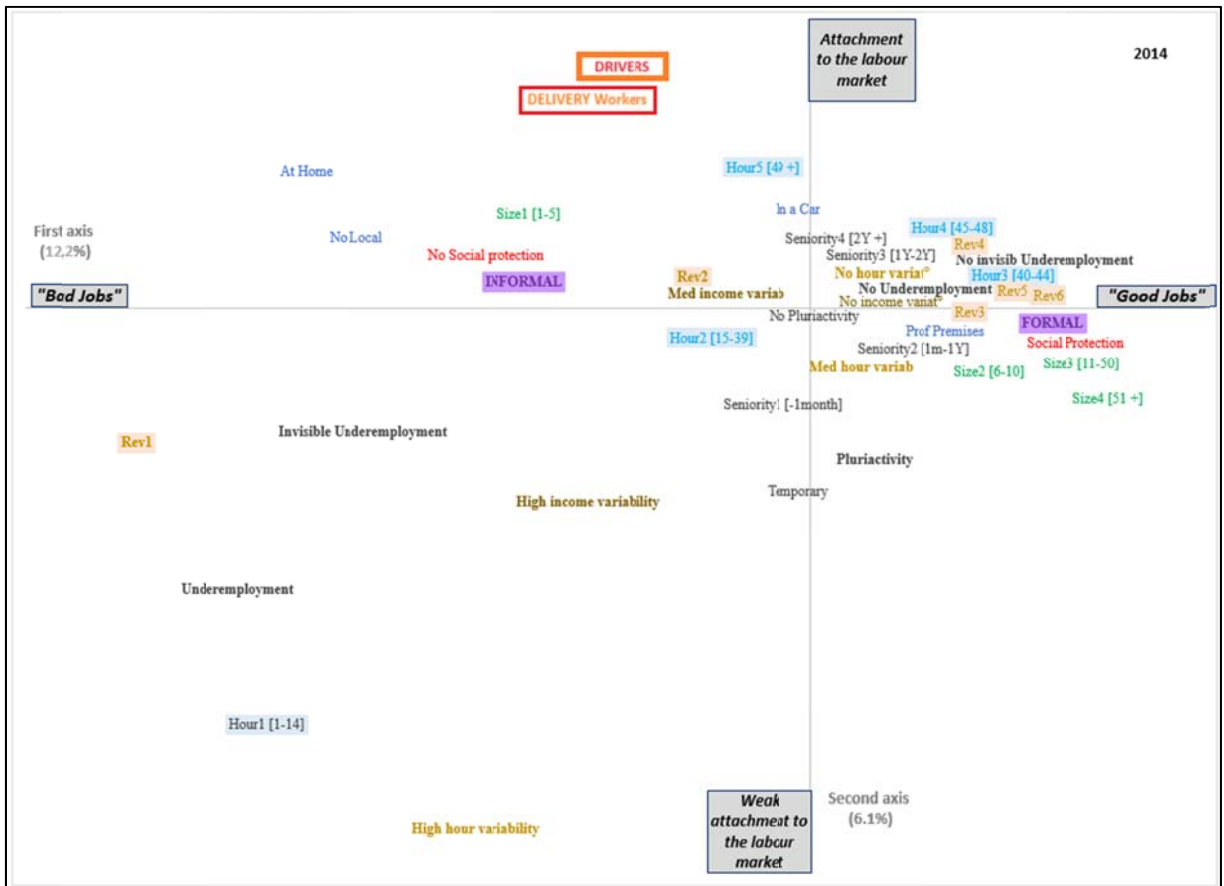
Source: PNAD Contínua, 2023, urban area, IBGE; authors' calculations.

Figure A5.2 The 'jobs space' of DDWs – 2023



Source: PNAD Contínua, 2023, urban area, IBGE; authors' calculations.

Figure A5.3 Formal, Informal and DDWs in the 'jobs space' in 2014



Source: PNAD Contínua, 2014, urban area, IBGE; authors' calculations.