



Labor market in Brazil: indicators, methodologies and recent developments

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Abstract

Labor market indicators are key instruments in microeconomic and macroeconomic analysis and, by extension, in the decision-making process of private agents and economic policymakers. Sources of information on the Brazilian labor market follow different methodologies in terms of type (survey or administrative record), scope, sampling design, frequency and purpose. These aspects may lead to distinct results, whose interpretation depends on understanding the characteristics of these statistics. This article aims to present and discuss the most important sources of labor statistics in Brazil, providing an overview of their methodologies and recent developments, and stressing the main possibilities and pitfalls when utilized on economic analysis.

Keywords: labor force; surveys; administrative records; possibilities and pitfalls.

1. Introduction

Labor market statistics are essential in the decision-making process of private agents and economic policymakers. Many research areas deal with this subject, developing, for example, microeconomic models about the labor market structure and functioning, coupled with macroeconomic analysis in which indicators such as the unemployment rate and the income level are key variables. Therefore, the availability of reliable statistics and reasonably lengthy data series are fundamental for the achievement of robust results.

Sources of information about the labor market in Brazil follow different methodologies in terms of type of data gathering (household sample surveys, enterprise sample surveys, and administrative records), scope, coverage, sampling design and frequency. Since these features may interfere with the conclusions of economic analysis, the understanding of such specificities is necessary for an adequate utilization of the data and interpretation of results.

In this context, the purpose of this article is to present the chief sources of Brazilian labor statistics and to discuss their most relevant methodological guidelines and recent developments, illustrating their advantages and disadvantages, particularly under the prism of data users. Following this introduction, the article discusses, in the second section, the different sources and methodologies, elaborates quantitative comparisons about the behavior of some indicators obtained from different sources in the third section, and, in the fourth section, presents the conclusions.

2. Labor statistics in Brazil – methodological issues

Among major currently available sources of information on the labor market in Brazil are:

Household surveys

- Continuous National Household Sample Survey (PNADC), from the Brazilian Institute of Geography and Statistics (IBGE);
- Annual National Household Sample Survey (PNAD), from the IBGE;³

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³ It began in 1967, but the overall coverage of the national territory was achieved only in 2004. It surveys socioeconomic and demographic characteristics and has been reviewed throughout the years. It shall be replaced by the PNADC.

- Monthly Employment Survey (PME), from the IBGE;⁴
- Employment and Unemployment Survey (PED), jointly elaborated by the State Data Analysis System Foundation (SEADE), the Interunion Department for Statistics and Socioeconomic Studies (DIEESE) and regional statistical institutes;⁵

Administrative records

- Annual List of Social Information (RAIS), from the Ministry of Labor and Employment (MTE);
- General File of Employed and Unemployed People (CAGED), from the MTE.

In addition to those that have labor statistics as the principal goal, several surveys also compile data on employment and overall wages, such as the annual IBGE structural research on economic sectors, the IBGE's Monthly Industrial Survey - Employment and Wages (PIMES), coupled with inquiries carried out by industry and trade federations. Furthermore, there are specific databases, like those related to government programs (unemployment insurance, job vacancy and recruitment intermediation, etc.).

Methodological differences among these sources of information should be taken into account in statistical analysis⁶ of indicators and results. The most relevant include:

- Coverage – geographic coverage, target population and type of job/occupation surveyed;
- Type of data gathering – household sample survey in which the respondent is the selected household individual or administrative record for which the respondent is the employer;
- Concept of variables – different concepts are utilized in distinct surveys (in some cases, this is due to international guidelines that are frequently updated);
- Relevant variables – refer to individuals in household surveys and to job contracts in administrative records;
- Geographic localization – information from household samples refer to the geographic area in which the respondent is resident, while information sent by employers in the RAIS/CAGED refer to the job contracts generated in the geographic area in which the employer's establishment⁷ is located;
- Precision – household surveys produce estimates for which the level of precision is measurable and depends on the sampling design and statistical parameters, while administrative records' bias is usually not measurable, and comes as a result of respondents' omission⁸ or error;
- Reference period – surveys may be carried out in different reference periods, even though with the same periodicity (for example, the majority of labor items surveyed in the annual PNAD considers the reference period as a week in the month of September; the RAIS reference period is December 31; the majority of PME's questions surveys the situation in the interview's previous week or in the 30-day period up to that week's last day, and a certain month's sample is distributed so as interviews are conducted in the final three weeks of the month or the first week of the following month; as for CAGED, employers send information on hiring and termination of employment occurred in the previous month);
- Periodicity – annual, quarterly or monthly.

⁴ Probability sampling survey of household units (private households or household units in collective households) carried out monthly to survey the characteristics of urban population residing in the metropolitan areas of Belo Horizonte, Porto Alegre, Recife, Rio de Janeiro, Salvador and São Paulo. Under the current methodology, the series start in March 2002. In December 2015, it will be interrupted and replaced by the PNADC. Rotating scheme 4-8-4, i.e., each selected household participates in the survey for 4 consecutive months, remains absent for 8 months and resumes its participation for 4 additional months in the sequence. Every month, 25% of the sample is replaced; the sample overlay rate is 50% for the same month, in pairs of consecutive years. There are researches that employ the same methodology and are accomplished in partnership with the IBGE for the metropolitan area of Curitiba (up to October 2013) and for the municipality of Rio de Janeiro. Key concepts differing from the PNADC: Working-age population – people 10 years old or more; Unemployed population – people who did not perform work in the reference week, but were available to work in that week and effectively sought for work in the reference period of 30 days without success or effectively sought for work after leaving their last jobs in that 30-day period.

⁵ In spite of the monthly periodicity, estimated indicators are obtained from data accumulated in the quarter. It includes the Federal District and the metropolitan areas of Belo Horizonte (interrupted in June 2014), Fortaleza, Porto Alegre, Recife, Salvador and São Paulo. The survey is also conducted in the ABC region of São Paulo.

⁶ It should be highlighted that the knowledge of the sampling design is necessary for the achievement of correct estimates from complex samples.

⁷ The larger the number of individuals working outside their municipalities of residence, the greater the divergence between household sampling surveys and administrative records.

⁸ Differences between target population coverage are observed even among administrative records coordinated by the same institute. For instance, there are establishments that, although obliged to declare in both records, send information to RAIS and not to CAGED or vice-versa.



The advantages of the administrative records mentioned above are associated with the geographic coverage, the diversity of available indicators related to the employer and employee and the timeliness (especially CAGED). Limitations include the coverage of formal jobs only, the lack of additional variables related to the worker's household, and respondents' errors and omissions. The advantages of the household sampling surveys, on the other hand, refer to the gathering of information about every modality of job and the universe of unemployed, the diversity of variables related to the characteristics of all residents in surveyed household units, and the rigorous statistical parameters. The disadvantages, in some surveys, mainly reflect the restricted geographic coverage or the delayed availability.

Another relevant issue concerning household sample surveys refers to international guidelines for the compilation of labor statistics, which are constantly improved and provide for clear definitions and procedures. Nonetheless, they do not provide for adequate instructions concerning the harmonization of questionnaires, even though it is openly assumed that the sequence and the contents of questions may interfere with the survey's results.

Among the several sources mentioned above, it should be emphasized the PNADC and the RAIS/CAGED administrative records, whose methodologies are summarized below.

RAIS and CAGED

MTE's nationwide administrative records elaborated yearly (RAIS) and monthly (CAGED), compulsory for all⁹ enterprises, encompassing the totality¹⁰ of formal jobs, except domestic employees.

Information is released according to the employment stock (number of jobs) and fluctuation¹¹ (job gains and losses). Data can be broken down by the establishment's geographic location, economic activity and size, and the worker's occupation, gender, age, education, job tenure, type of contract, reason for termination, earnings, etc.

The reference date to the RAIS is December 31, and information is sent from January to March of the following year. Recently, the survey's coverage has reached nearly 97% of organized economic sectors. RAIS was established by Decree no. 76900/75, with data since 1985 available on the website. CAGED's reference period is monthly; information sent up to the seventh day of the subsequent month are considered timely statements; information sent after this deadline up to twelve months after the reference period are considered delayed statements, but are included in the revised employment index. The survey's coverage has reached nearly 85% of the target population recently, of which 95% of information in sent before the deadline. CAGED was established by Law no 4923/65 and data since 2004 are available on the website.

PNADC

Probability sampling survey of household units (private permanent households), carried out on a quarterly¹² basis by the IBGE for the research of demographic and socioeconomic characteristics of the population resident in the national territory.¹³ It began in 2012 and was designed to produce results for the estimation domains of Brazil, Major Regions, Federation Units (UFs), twenty Metropolitan Areas¹⁴ containing capital municipalities, the Development Integrated Area of the Broad Teresina and capitals.

⁹ For CAGED, information is compulsory to establishments that registered hiring or termination of employment during the month.

¹⁰ For the inclusion in the RAIS, the types of job contracts taken into account are those under the Consolidation of Labor Laws (CLT), statutory workers (public servants), temporary job contracts, contracts for definite period of time, and occasional workers (at ports) when contracted by trade unions. For CAGED, the types of job contracts are those under the CLT, including temporary job contracts and contracts for definite period of time, excluding domestic and occasional workers.

¹¹ Job gains (hiring) and losses (termination) refer to job changes occurred in the establishment, including workers' transfers from one unit to another of the same enterprise; hiring means the signing of a job contract in the reference period for whatever reason; termination means the end of a job contract during the reference period for whatever reason (dismissal, transfer, retirement, death), either by the employer or the employee decision.

¹² There is no sample overlay between two consecutive months. However, monthly results for selected indicators are released to the country as a whole referring to moving quarters. Between two moving quarters, information related to 2 months are repeated (same interviews).

¹³ Except embassies, consulates and Brazilian representations abroad and areas with specific characteristics, i.e., sectors of military bases, lodging, camping areas, boats, ships, penal colonies, orphanages, monasteries, hospitals, rural colonies, census sectors located in indigenous areas, etc.

¹⁴ Metropolitan areas of Manaus, Belém, Macapá, São Luís, Fortaleza, Natal, João Pessoa, Recife, Maceió, Aracaju, Salvador, Belo Horizonte, Vitória, Rio de Janeiro, São Paulo, Curitiba, Florianópolis, Porto Alegre, Vale do Rio Cuiabá and Goiânia.

PNADC¹⁵ adopts a stratified¹⁶ two-stage cluster sampling design. Primary sampling units (PSUs) are the census sectors (Demographic Census 2010) or grouped census sectors (for sectors with fewer households) and secondary sampling units (SSUs) are the household units. In the first stage, PSUs are selected on the basis of a probability¹⁷ proportional to the number of households and, in the second stage, 14 occupied households are selected from each PSU, according to simple random sampling.¹⁸

The sample is divided by the three months of the conventional quarter, according to the rotating scheme 1-2(5), i.e., each selected household is visited five times with a two-month interval in between. The sample overlay rate is 80% of households between two consecutive conventional quarters and 20% between the current quarter and the same quarter in the following year.

The concept of work for the production of goods and services encompasses the following modalities: a) work paid by means of money, goods, merchandise or benefits (lodging, food, etc.); b) work not directly paid to the individual, performed to support the economic activity of a household member or a family member.¹⁹

3. Trajectory of labor market indicators – comparing results from different sources

In principle, the availability and coexistence of several statistical sources is beneficial in view of their possible complementarity, as long as their characteristics and limitations are taken into account. However, in some circumstances, divergent results may be seen as unreliable and make economic analysis more difficult.

In this section are shown comparisons among the results of some key labor market indicators obtained from different sources, particularly involving the recent trajectories of the unemployment rate, employed population and economically active population/ labor force in the PME and PNADC, and the formal employment level in the PME, PNADC and RAIS/CAGED records. The choice of these indicators was based on their relevance and the interest concerning the imminent replacement of the PME by the PNADC. The limited comparison²⁰ period is due to the short PNADC availability, since it is a quarterly research that began in 2012.

In order to enhance the comparability, the following adjustments were implemented:²¹

- PME statistics were estimated for people aged 14 years and older (adjusted PME), the target population of the PNADC;
- the employment level from the CAGED took into account the total of occupied people with formal jobs under the CLT, according to the RAIS of December 2013, and the monthly net job balance according to the CAGED, including delayed statements;

¹⁵ PNADC is part of the IBGE Integrated System of Household Surveys, which consists of a model for the elaboration of surveys on the basis of a master sample and harmonized concepts and procedures.

¹⁶ The stratified sampling was carried out in several steps in order to guarantee a proper sample of households in the estimation domains, sample spatial spreading and more precise estimates.

¹⁷ The selection of PSUs utilized the Pareto sampling that combines the technique of permanent random numbers and the relative PSU size in the rotating group.

¹⁸ Every quarter, PNADC surveys 211,344 households. The expected coefficient of variation for the Brazilian total unemployed population estimate is 1.3%.

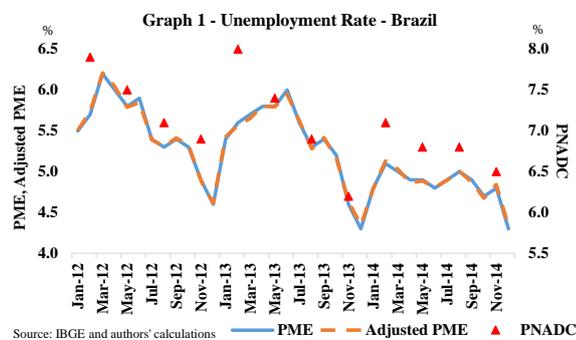
¹⁹ Both “a” and “b” types of work are adopted for the definition of labor force and utilized in quarterly indicators. PNADC includes a second, broader questionnaire in one of the interviews in each household unit, surveying other types of work: in the production of goods and services for own personal consumption or consumption of persons living in the household; volunteer work; internship/apprenticeship paid solely on learning; unpaid work for taking care of people; and housework. The results of this broad questionnaire are aggregated for estimating annual indicators. Other relevant concepts: Working-age (active age) population – people 14 years old or more in the reference date; Employed population in the reference week – working-age people who worked for at least one hour in the period according to the types in items “a” or “b” above, or who had paid work but were absent during that week; Unemployed population in the reference week – working-age people who did not perform work that generates income for the household in that week, but effectively sought for work in the reference period of 30 days and were available to work in the reference week, or working-age people who did not perform work in the reference week and did not effectively sought for work in the reference period of 30 days because they had already found a job to be started after the reference week; Labor force in the reference week - the sum of employed and unemployed population in the reference week.

²⁰ Any comparison between indicators obtained from surveys with different methodologies present relevant restrictions, even with proper adjustments, especially when the realization period is reduced. However, since this article deals with the several sources of information on the Brazilian labor market, these comparisons have the purpose of helping to understand their differences and their influence on the results.

²¹ So far, PNADC has released only data for Brazil and major geographic regions, thus making it impossible to carry out adjustments for matching the PNADC and PME geographic coverage.

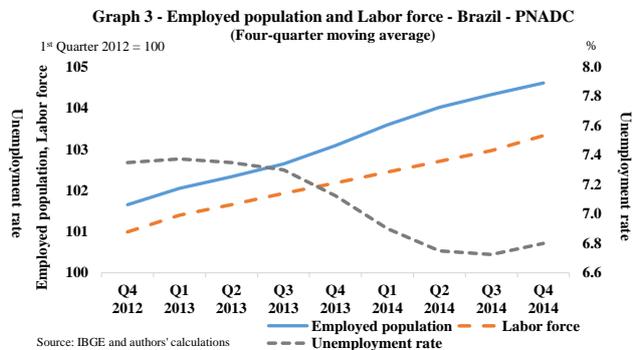
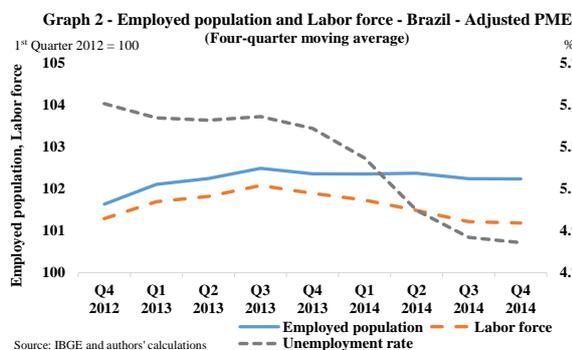
- the level of formal employment/generation of formal jobs from the PNADC and PME took into account the registered workers, except domestic employees (formal PNADC and formal adjusted PME);
- the indicators economically active population/labor force, employment level and formal employment level were transformed into index numbers;
- if required, PME and CAGED statistics were transformed into quarterly data.

According to the adjusted PME, the unemployment rate followed a gradual downward trajectory in the 2000's, explained by a significant job generation, a process that seemed to have reached stability recently, a path similar to that followed by the PNADC indicator during its short survey period. The trajectories of unemployment rates are consistent in both surveys, with a correlation of 83.4% between the levels of these indicators and 74.0% between their quarterly variation in the period from the first quarter of 2012 and the last quarter of 2014 (Graph 1). However, a discrepancy in the level of unemployment rates may be observed between both surveys, possibly due to, at least in part, different geographic coverage, variations in the concept of unemployed persons or, still, the influence of the questionnaires' flow.



A change in the trajectory of the unemployment rate may be observed in the end of 2013 in both surveys, when a new downward trend starts and continues up to the third quarter of 2014. The reasons underlying this downward trajectory, however, differ in both surveys, according to the analysis of the behavior of unemployment rate components, possibly leading to significantly divergent interpretations of the labor market scenario.

In the PME, the trajectories of economically active population and employed population allow to conclude that, unlike in previous periods, the decline in the unemployment rate observed as of the end of 2013 was due to the reduction in the economically active population, thus suggesting that unemployed people no longer searching for jobs left the market, or that employed people left the market and their jobs were reallocated to people that were looking for jobs (Graph 2).



PNADC, on the other hand, did not indicate slowdown in the pace of growth of the employed population or decline of the labor force in the period under analysis (Graph 3). According to this survey, job gains persisted as the most significant factor underlying the unemployment rate decline. This difference between PME and PNADC could be likely attributed to different geographic coverage or

periodicity (quarterly average of monthly indicators or quarterly sample indicators), variations in the concept of unemployed people or, still, the influence of the questionnaires' flow. Nonetheless, this recent issue deserves attention. Regrettably, the short PNADC series availability is an obstacle for a proper investigation.

With regard to the comparison of the formal employment level according to the PME, the PNADC and the RAIS/CAGED records, different values may be observed, consequent upon methodological differences (sample survey versus administrative records, coverage restricted to the six metropolitan areas in the PME versus nationwide coverage in the PNADC and CAGED). However, a strong correlation may be noticed when indicators are transformed into index numbers. Furthermore, quarterly movements of the formal PNADC and the CAGED indicators are highly correlated (70.3%). On the other hand, quarterly fluctuations of these indicators show weak correlation to variations in the formal adjusted PME indicator (12.7% and 23.7%, respectively for formal PNADC and CAGED) in the period 2012-2014. Considering the CAGED data for the same geographic coverage of the PME in the period 2004-2014, contemporary correlation measures reach 57.0% in quarterly variations and only 15.8% in monthly variations.

There is evidence of lagged capture²² of the trajectory of formal employment level in the PME in comparison to the CAGED. Among the hypotheses for explaining this lag are issues related to the reference periods, the nature of household samples and their dependence on the questionnaires' flow and the perception of respondents, as well as asymmetric information between employees (responding the survey) and employers (responsible for CAGED's records).

4. Conclusions

The availability of several sources of statistical information provides opportunities to take advantage of their complementarities for the improvement of analyses. However, the knowledge of the distinct methodologies and specificities of each database is essential for their adequate utilization and the achievement of correct estimates and proper interpretations. In this sense, this article aims to give a contribution to the debate about the sources of information on the Brazilian labor market, by discussing their most relevant methodological characteristics and carrying out a brief comparison of recent results for selected indicators.

References

- Fundação Seade e Dieese (2009). *Sistema PED*. São Paulo, Brasil.
- IBGE (2007). *Pesquisa Mensal de Emprego*. Série Relatórios Metodológicos, v. 23. 2ª ed. Rio de Janeiro, Brasil.
- IBGE (2011). *Pesquisa Nacional por Amostra de Domicílios*. Notas Metodológicas – Pesquisa Básica. Rio de Janeiro, Brasil.
- IBGE (2014). *Pesquisa Nacional por Amostra de Domicílios Contínua*. Notas Metodológicas. Rio de Janeiro, Brasil.
- IBGE (2015). *Esclarecimentos sobre os resultados da PNAD Contínua produzidos mensalmente*. Nota Técnica. Rio de Janeiro, Brasil.
- MTE (2010). *Registros Administrativos: RAIS e CAGED*. Brasília, Brasil.
- MTE, Dieese e Fundação Seade (2004). *CAGED e PED – Diferenças Metodológicas e Possibilidades de Comparação*. Nota Técnica MTE-Dieese/Seade. Brasília, Brasil.
- MTE e IBGE (2004). *CAGED e PME – Diferenças Metodológicas e Possibilidades de Comparação*. Nota Técnica IBGE-MTE. Brasília, Brasil.
- Quintslr, M. M. M. & Hypólito, E. B. (2009). *Development of an Integrated System of Household Surveys: The Brazilian Experience*. 57th Session of the International Statistical Institute. Durban, South Africa.

²² Evidence appointed by lagged correlation measures and Granger causality test. The evidence remains for the comparison to the CAGED's series, excluding delayed statements.