

The recent evolution of the Brazilian labor market from the perspective of the concept of the industrial reserve army

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RESUMO

O mercado de força de trabalho brasileiro é historicamente caracterizado por altas taxas de desemprego, subemprego e informalidade. Por isso, para estudá-lo, conceitos teóricos que conseguem englobar estas características são necessários, como o conceito de exército industrial de reserva desenvolvido por Marx no livro I de “O Capital”. Este artigo procura realizar esta tarefa, para isso desenvolve-se um estudo teórico deste conceito e depois faz-se uma experiência empírica com a tentativa de mensuração do exército industrial de reserva do Brasil na década de 2000.

Palavras-chave: exército industrial de reserva, desemprego, subemprego.

ABSTRACT

The Brazilian labor market has been historically characterized by high unemployment rates, underemployment and informality. Thus, theoretical concepts that involve these features are necessary to study the labor market such as the concept of industrial reserve army developed by Marx in *Capital* Volume 1. This paper develops a theoretical study of this concept and then an empirical exploration to measure Brazil's industrial reserve army in the 2000s.

Key words: industrial reserve army, labor, unemployment, underemployment.

1. INTRODUCTION

The concept of the industrial reserve army of labor (IRAL), developed by Marx in vol.1 of *Capital* is important for any Marxist analysis of the economics and sociology of labor. It is important that the study of this Marxist concept not be disfigured by a dependence on concepts from other social theories. However, the official statistics of population and labor do not classify the population in accordance with Marxist theory, complicating the possibility of a Marxist analysis and provoking the question of how to adapt and interpret data that has been generated through different methodologies and theoretical sources. There is also the additional problem that is how to adapt the concept of IRAL and its division in three different layers of contemporary capitalism.

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Despite these challenges, this article aims to theoretically develop the concept of the IRAL based on the initial formulation of Marx in *Capital*, attempting to measure the IRAL from official Brazilian statistics on work and the labor market. It is divided into four sections in addition to this introduction: Section 2 rescues the concept of IRAL, especially its division in three layers and its implications; Section 3 explains how data was obtained from PNAD (National Households Research) data from the Brazilian Institute of Geography and Statistics (IBGE) and how they may be used in Marxist analysis, developing a methodology for measuring the ILAR from the PNAD data; in Section 4, we measure the Brazilian IRAL based on the PNAD data and our methodology, analyzing and commenting on the results obtained; we make concluding comments in the final section of the paper.

2. THE DIVISION OF THE IRL IN THREE LAYERS

In general, the IRAL of the working population is not employed by capital, but is available to be employed if necessary. It is formed from the growth of the proportion between the means of production and the labor force that leads to a fall in the demand by capital for labor power. The magnitude of capital accumulation allows workers from the IRAL to be recruited when accumulation increases and to be let go when it decreases.

The IRAL refers to that part of the working population not employed by capital (whether it be industrial, commercial or financial) or by accessory institutions³ that legitimate capital (such as the state, the armed forces, NGO's, trade unions). Such workers are available

³ This article calls "accessory institutions" all those institutions that employ salaried workers, but are not properly of capital since they do not have the objective of producing or circulating surplus value. To the contrary, they need to capture a part of the surplus value produced in the capitalist economy to exist, but they do exercise important social functions for the maintenance of the capitalist mode of production. There are a series of non-capitalist institutions that employ salaried labor, each one with a specific function in the legitimation of capitalism, such as the state, the armed forces, the unions, non-governmental institutions, among others. These institutions play a crucial role in capitalism which is primarily to legitimate private property and even to defend it, as in the state and the armed forces; the state may also assume additional functions such as education, healthcare and social assistance, for example. Unions, despite arising from challenges to the state from discontented workers, frequently participate in the legitimation of capitalism: many of them have become mere instruments to decide salary levels within given levels of capital accumulation, to submit the interests of workers to capitalists or even as a formal instrument for class collaboration. But it is important to qualify that many unions retain their critique of capitalism and remain powerful instruments of struggle for the working class not only in improving living conditions, but also for the revolutionary transformation of society. This article does not have the objective of deeply studying these institutions; in fact, they are ripe for study from further Marxist analyses.

to be employed (in different degrees of availability) depending on the demands of capital and its accessory institutions for labor.

The formation of the IRAL is directly related to capitalist development, that is, it is directly linked to the tendency for the organic composition of capital⁴ (OCC) to grow over the long term: growth in the OCC means that less and less workers are employed relative to the means of production and that a determined quantity of capital will employ less and less workers. This parcel of the working population which become superfluous to capital is denominated the relative surplus population or IRAL.⁵

The growth of the OCC creates a working population available to capital, that is, capital controls the supply of jobs, which does not depend on the natural increase in the working class, but in great part is created by capital itself. We may add to this IRAL a significant part of the working class that has still not yet been employed by capital (youth, homemakers, autonomous workers), but is potentially available depending on demand and may then enter directly into the IRAL. However, it is capital itself (and not the working class) who controls the supply of work to the labor force.

Yet at the same time as capital creates and boosts the IRAL with the growth in the OCC, the rhythm of capital accumulation demands a certain quantity of workers which may amortize the rise in the IRAL. It thus fluctuates according to the growth in the OCC (which will produce a given amount of the available workforce) and accumulation. In this way, capital commands both the demand for labor, which depends on the level of accumulation determined by the OCC, as well as the supply that is created by growth in the OCC. In the following passage in *Capital*, Marx describes this peculiarity of the capitalist mode of production:

The demand for labour is not identical with increase of capital, nor supply of labour with increase of the working class. It is not a case of two independent

⁴ The organic composition of capital (OCC) is the relation between the means of production (machines, tools, raw materials) and the labor force in terms of value. That is, given a particular quantity of capital, the larger the OCC, the larger the proportion of the means of production in relation to the labor forces. In other words, given a particular quantity of capital, the larger the OCC, the less demand by capital for the labor power of workers.

⁵ Throughout his exposition of the concept of IRAL, Marx also calls it the relative surplus population. In *Capital*, Marx treats them as synonyms. However, a qualification is necessary: in the *Grundrisse*, Marx only uses the denomination “surplus population” (IRAL only appears in *Capital*) and in a wider context: the relative surplus population is seen as a part of the population that loses the conditions under which they are able to continue appropriating a part of the social product in a determined social context (MARX, 1972. pp. 114-115; 1993. pp. 603-604). The surplus population appears under different forms in each mode of production, each one according to the specifics of the mode in which humans works and practice this appropriation. In this respect, the IRAL could be seen as the form that the surplus population takes in capitalism.

forces working on one another. *Les dés sont pipés*. Capital works on both sides at the same time. If its accumulation, on the one hand, increases the demand for labour, it increases on the other the supply of labourers [due to the increase in the OCC] by the “setting free” of them, whilst at the same time the pressure of the unemployed compels those that are employed to furnish more labour [through intensification of work and submission to longer work days], and therefore makes the supply of labour, to a certain extent, independent of the supply of labourers. The action of the law of supply and demand of labour on this basis completes the despotism of capital. (Marx, 1867, MIA, Chapter 25, Section 3, Capital, vol.1)⁶

Capitalist development and the consequent formation of the IRAL lead the working population to devise different survival strategies when they are not employed by capital and, therefore, do not receive a salary that allows them to live. In this way, the mass of the IRAL is not homogenous with respect to its average conditions of life, its probable permanence in the IRAL or even to its very class origins.

The IRAL is composed by all members of the working class who are not able to sell their labor to capital; they could be unemployed or occupied in activities not dominated by capital, for commercial purposes or not. That is, the IRAL is not constituted just by the unemployed even though this group is certainly more available to be recruited for wage labor. There are also a series of workers who are not necessarily looking for work in the formal labor market, but are occupied in activities not dominated by capital including non-market focused activities in the domestic sphere such as domestic laborers or homemakers, or even in market-focused activities by the self-employed who work in small commercial activities or small-scale mercantile production.

Marx distinguishes three layers in the IRAL: i) *floating*, “the labourers [who] are sometimes repelled, sometimes attracted by sectors of industry”; (ii) *latent*, workers who are “constantly on the point of passing over into an urban or manufacturing proletariat. and on the look-out for circumstances favorable to this transformation; and (iii) *stagnant*, who are those “with extremely irregular employment [who provide] capital an inexhaustible reservoir of disposable labour power (...) [with] conditions of life sink below the average normal level of the working class.” Marx also mentions *pauperism* “the lowest sediment of the relative surplus population” and the *lumpenproletariat*, “the refuse of the proletariat”.⁷ (Marx, 1867, MIA, Chapter 25, Section 4).

⁶ The translator has used already existing translations of Marx’s works found on the Marxists Internet Archive.

⁷ In this article, pauperism refers to the condition of absolute and/or relative poverty of portions of the working class in capitalism with absolute pauperism found as much in the employed population as in the reserve army, but much more in the latter than the former. All parts of the working class, the employed and the reserve army,

In dividing the IRAL into three layers, Marx aimed not only to characterize a heterogeneous group, but also to gradate it in relation to their relative availability for the immediate necessities of capital. The layers are organized according to the facility by which persons in each group may sell their labor power to capital.

In this respect, the unemployed worker and those looking for work are more easily available to capital than the active workers who do not rely on capital or accessory institutions. For this reason, unemployed workers belong to the *floating* layer of the IRAL. The very name floating suggest such workers' flexibility in terms of the size of the layer as well as the time the worker stays there. It is floating because it is the layer that most varies in size depending on the accumulation cycle: in periods of acceleration and growth, it is this layer in the IRAL that most rapidly diminishes; in periods of crisis, this layer most rapidly increases. It is also floating because the worker passes relatively little time in it (it is impossible to be in this layer for the whole active life of the worker, for example) since they cannot last a prolonged period of unemployment without wages; it compromises the very physical and moral survival of the worker forcing them to utilize their own survival strategies while they are not employed by capital and to descend into the deeper categories of IRAL.

The floating population of workers in the IRAL have perspectives to sell their labor to capital, but find themselves with temporary difficulties for not having previous work experience or not having a sufficient income to survive without the help of other people. This is the case of young workers who are sustained by their families while they are unemployed and for this reason their unemployment rate is always higher than more experienced workers. Workers who have difficulties selling their labor power because of social discrimination, such as women, blacks and those with little schooling, in the Brazilian case, tend to spend more time in the floating layer of the IRAL than workers who do not suffer characteristics, such as white men with a medium or high level of schooling. As a result, their unemployment rates are always lower. There are also floating IRAL workers who are no longer able to survive unemployed, without income or chance of a job, and become self-employed or pursue subsistence strategies, that is, they transfer themselves to deeper levels of the IRAL. Older

suffer from a relative pauperism throughout their lives. The lumpenproletariat is that part of the working class that is completely socially degraded and is not available for salaried employment by capital. It is born in absolute poverty among sections of the working class that end up with no perspective or illusions of having a dignified existence, which forces them into a situation of marginality and thus becoming unavailable for salaried work or any other type of employment.

workers who are heads of families are often in this situation where their formally low level of unemployment in the statistics masks their low participation in active salaried work.

In the latent and stagnant layers of the IRAL, the worker is employed in activities not controlled by capital, through self-employment or not, and is not as available to capital as the floating population of workers. Compared to the variability of the floating layer, the force of capital accumulation has to be much stronger in these layers to reduce their numbers; conversely, the crisis of capital has to be much more severe to increase them. The time that the workers spend in them is also longer than the floating layer since they may very well remain there the rest of the active economic lives without ever selling their labor power to capital.

The difference between the latent and stagnant layers is related to their insertion or non-insertion in production for the capitalist market. In the latent layer, workers are not inserted into the capitalist market since their activities are linked to self-subsistence, domestic production or the remains of other modes of production. The transfer of these workers to the active labor force or to other layers of the IRAL depends on the entrance of capital in non-capitalist production spheres. This may occur because of the pressure of capital accumulation, for example, when a female workforce that was previously engaged in domestic production, is integrated into capitalist production.

In the definition of the latent layer of IRAL, Marx directly refers to agricultural workers who loses their jobs because of the implementation of capitalist production in the field and its transformation into a capitalist industry. For a number of specific reasons related to the agricultural industry, such as technological progress, this growth in capital accumulation does not necessitate more agricultural workers who are thus forced to search for work in non-agricultural industries or commerce. But until what point a rural salaried laborer, who sells his or her labor to capital, may be considered as belonging to the active labor force or as belonging to the latent layer of IRAL for being workers who will soon be unemployed or whose employment is unstable, seasonal and incomplete?

This article argues that the key to understanding the concept of latent IRAL is related to the process of the transformation of non-capitalist production and circulation activities into capitalist industry and commerce as was the case with the entrance of capitalism in European feudal agriculture in the nineteenth century and the entrance of capital in domestic production, traditional artisanal industry and in the remains of non-capitalist

agriculture. In this reasoning, the latent IRAL constitutes that part of the population who are active in non-capitalist economic activities, which currently are confined to basically domestic production.

However, capitalism does not necessarily need to enter in these non-capitalist activities to attract their active workers. Accumulation in capitalist sectors of the economy may attract parcels of this latent IRAL without destroying these non-capitalist sectors who simply are reduced in size without becoming capitalist and come to be more and more insignificant to the economy as a whole.

For their turn, workers in the stagnant layer are occupied in activities inserted into the capitalist market, but are not subordinated to capital, that is, they are not salaried workers of capital. In this layer, we find those workers who are self-employed without formal or informal contractual relations with capitalist companies, that is, all types of service providers (gardeners, shoe shiners), small merchants (fairs and street-sellers), and small agricultural producers who sell their products. The stagnant layer of IRAL is also one of the “doors of entry” to the proletariat for the pauperized petit-bourgeoisie whose business have failed due to capitalist development and who are gradually transformed from bosses to the self-employed.

The permanence of the stagnant worker in the IRAL is the highest of all the layers since it is difficult to return to the salaried labor market; the force of attraction of capital accumulation has to be very strong for this to occur.

Among self-employed workers, those who are most interesting for a study of the stagnant layer of the IRAL are autonomous workers who sell their products and services to the capitalist market to subsist without any real links to a capitalist company⁸ or to a typically professional liberal category.⁹ According to Paul Singer, the sectors of the economy dominated by autonomous workers “tend to absorb the surplus labor force, that is, that which

⁸ The studies of employment and unemployment by DIESSE classify these autonomous workers who are linked to one or more companies as “autonomous workers in a company”. Self-employed workers are, in reality, a type of informal salaried workers and therefore are theoretically part of the employed section of the working class.

⁹ From a Marxist point of view, liberal professionals are those workers with a high degree of instruction and high levels of skills and specific knowledge of high complexity. In this group, we find workers with post-secondary education such as doctors, dentists, engineers, lawyers and accountants, among others. The activities involved by liberal professionals cannot be exercised by non-qualified workers because they are not able to achieve the necessary degree of knowledge and skills rapidly. Non-qualified professions in industry, commerce and banking, to the contrary, involve partial and repetitive tasks not demanding high qualifications by the worker who can be easily and rapidly trained to execute them. This does not mean that the progress of the productive forces does not cause impacts on liberal professionals, who also confront processes of growing disqualification over time with mechanization and simplification of the tasks traditionally carried out by them.

is found in the market economy, but are not able to employ themselves in the capitalist economy (SINGER, 1979. p.80).

The economic sectors dominated by the stagnant layer of the IRAL are principally those in areas with little penetration by capitalist companies. In Brazil, these include retail commerce, personal services, mechanics' shops, cleaning, transport and food serving and small mercantile agriculture. In all these sectors, capitalist enterprises are present, but there are a great number of autonomous workers either competing with them or working in areas where they have not yet arrived. For example, in retail commerce there are capitalist companies involved, from small convenience stores to large supermarkets, but there are still spaces which they have not occupied and which are filled by self-employed workers in the stagnant layer of the IRAL acting as itinerant market and street sellers.

The space available for such autonomous workers in these sectors tends to decrease with capitalist development and increase in crises especially in regions where the dimensions of the market are not large enough to attract a big capitalist company. When capitalist development takes over the space of these autonomous workers, the labor force previously acting in a self-employed position is not entirely incorporated into a salaried relationship with capital; in this process part of the stagnant layer of the IRAL moves to the active labor force and another part to different layers of the IRAL by the force of circumstances: floating (looking for work), latent (digressing to domestic production) or remaining stagnant (finding another position as an autonomous worker in a sector not yet dominated by capitalist companies).

The floating and stagnant layers are also organized in accordance with the degradation of the capacity of labour. We may imagine a human being who has a determined capacity to work which is not necessarily consumed in constant portions during the length of their active economic life, but is accompanied by the physical and intellectual vigor of the person – the larger this vigor, the more that can be consumed of this capacity. Compared to older workers, younger workers have, in general, more intellectual and physical vigor and because of this are more sought after by capital since they may extract a larger quantity of work due to the greater possibilities to intensify their work. As such, these young workers who still have a larger capacity to be exploited by capital have greater immediate perspectives to sell their labor force when they are unemployed. As a result, there is an accumulation of such workers in the floating category of the IRAL.

Yet those workers whose capacity to work is reduced, justly due to the exploitation they experienced as active members of the labor force, are less demanded by capital and only used when there is no other choice. They have little perspective to sell their labor power and end up pursuing strategies of survival through temporary jobs or as autonomous workers leading to their concentration in the stagnant layer of the IRAL. There are still those workers whose capacity has been completely exhausted by capital¹⁰ and are unable to work. For this reason, they leave the IRAL (for not being available to capital) and need to be sustained by the larger working class.

3. THE PNAD DATA AND MARXIST ANALYTICAL CATEGORIES

Keeping in mind the definitions of the three layers of the IRAL devised by Marx, we may now move to an empirical investigation to measure the size of the IRAL in a determined capitalist economy during a determined length of time. One of the only attempts to measure the IRAL through official statistics has been that of John Bellamy Foster and others in the 2011 article “The global reserve army of labour and the new imperialism” where the world IRAL is measured from data from the International Labor Organization (ILO) from almost all countries in the world between 1997 and 2011. In this article, the total world IRAL is calculated as the sum of the unemployed, self-employed, non-remunerated workers (or family members) and the economically non-active population from 25 to 54 years of age. There is no attempt to separate the IRAL in layers. The result is an IRAL that fluctuates between 60% and 65% of the total world labor force. An another attempt was made by Lúcio Kowarick (1985) who aimed to measure the size of the “urban marginal mass” between the 1950s and the 1970s through census and PNAD statistics. Beyond these two attempts, there have no other studies of this kind.

This article attempts a measurement of the Brazilian IRAL in the 2000s through the data from PNAD, based on the concepts developed by Marx. But before beginning the empirical work, it is necessary to first understand the available data base and how it may be analyzed through Marxist conceptual terms.

¹⁰ This draining may be physical or mental and manifests itself through “occupational diseases” which impede a persons to continue working such as lesions through repetitive force and depression, for example. There are also workplace accidents which may partially or permanently reduce the capacity of the worker.

The PNAD is an annual national statistical base whose objective is to complement data from the demographic Censuses that are conducted every ten years. While the Census interviews the whole population, the PNAD is based on a relevant sample. It is possible through the PNAD to obtain a series of demographic data of the Brazilian population such as education, work, income, housing, migration and fertility levels. For this study, PNAD data on work and incomes crossed with personal characteristics such as sex and age are used as a first measure of the Brazilian IRAL and to verify some characteristics of the socioeconomic profile of these workers.

The PNAD data on work divides the Brazilian population in two large groups: i) the PAA – the population in active age – who are all persons with more than 10 years of age and ii) the EIP – the economically inactive population, who are all persons with less than 10 years of age. Within the PAA, there are two groups of people: i) the EAP – the economically active population – who range from those who are employed to those who are looking for work; and ii) the NEAP – the non-economically active population – which includes those persons who are not occupied in economic activities nor are looking for work. In this group, there are students, homemakers, the retired, persons who live off rents and the unemployed who are not looking for work.

In turn, the EAP is also divided into two groups: i) the employed EAP, who are persons employed in economic activities; and ii) the unemployed who have looked for work in the thirty days before the data was collected. And, finally, the employed PEA is classified through seven types of employment according to definitions by the IBGE utilized in PNAD:

(1) Employer: A person who owns their own business with one or more permanently remunerated employees. Not included in this category are individuals who work in domestic labor, are non-paid or who will eventually have paid activity.

(2) Employed: A person who works for an employer (either a physical person or a registered juridical company) and is generally obliged to work a workday and receive remuneration in money, products or benefits (housing, food, clothes, etc.) In this category, we may include a person who provides compulsory military service and also the clergy. This group includes all persons who have a formal or informal employment relationship.

(3)Domestic Worker: A person who provides domestic service in one or more household units and is remunerated either in money or benefits.

(4)Self-employed: A person who works for themselves or with a partner without being employed and counting on, or not, the help of non-remunerated workers. This group includes sellers of professional services up to liberal professionals.

(5)Unpaid worker: A person who works without pay to help a member of a household unit who could be either an employer or someone self-employed.

(6) Worker who produces for their own consumption: This is a person who works for their own consumption generally in the production of primary goods.

(7) Worker in construction for their own use: a person who works in the construction of buildings, private roads, artisanal wells and other improvements (except those characterized solely as renovations) for their own use in at least one household unit.

To transform these official data in compatible categories of Marxist analysis it is first necessary to define them and construct analogies. First, the basic social classes of capitalism are born within a structure of capitalist ownership (the private property of the means of production) so the population of capitalist countries may be divided into two classes: i) the capitalist class, which is formed by the owners of the means of production and the buyers of labor power, whether they are large (bourgeois) or small (petite-bourgeois); and ii) the working class which is formed by those who sell their own labor to capitalists. This labor power could be: i) effective, in the case of salaried workers or economically active in the labor force; ii) potential workers in the case of those in the IRAL; and iii) those impeded to sell their labor power due to any circumstance such as those unable to work, the lumpenproletariat or children and the very old.

In the following table we relate the groups that the IBGE uses for the Brazilian population with Marxist concepts of social classes and the division of the working class into economically active and, especially, the IRAL and its layers:

TABLE 1 – TRANSPOSITION OF THE IBGE CLASSIFICATION TO MARXIST CATEGORIES OF ANALYSIS

IBGE Position	Social Classes/ Division of the Working Class/ Layers of the IRAL
Employer	<p>Capitalists</p> <p>They are capitalists since they are owners of capital, but it is worthwhile stressing their heterogeneity. Among the capitalists in the IBGE data, there are large capitalists who truly maintain economic and political power. Numerically, there are very few of these. There are also small capitalists with few employees and with a much lesser standard of living that constitute a considerable part of the contingent of capitalists. Therefore, the capitalist class measured here combines the bourgeoisie and the petit-bourgeoisie.</p>
Employee	<p>Salaried Workers (Active)</p> <p>Includes all salaried workers in the public sector (state and military workers) and the private sector (formal and informal).</p>
Self-employed	<p>Stagnant IRAL</p> <p>This is a problematic category in which to make analogies with Marxist concepts. Self-employed workers form a heterogeneous contingent and, as a result, not all should be included in the stagnant IRAL layer. However, we classify all self-employed workers in this category with two qualifications: i) a small part is formed by liberal professionals – in 2009, according to the PNAD data, there were 464,000 liberal professionals associated to unions in a universe of almost 19 million self-employed workers (that is, 2.5% of the total). Since there is no way to separate them out, they may cause a slight statistical aberration; (ii) there is no way to distinguish in the PNAD data self-employed workers who also have informal links with a company and those who are working directly in the market. Thus, there is a slight exaggeration of the size of the stagnant layer in IRAL and a slight underestimation of the number of employees in the economically active population.</p>
Non-paid workers	<p>Stagnant IRAL</p> <p>In this study, such workers form part of the stagnant layer of the IRAL along with self-employed workers with which they are generally linked.</p>
Domestic Workers	<p>Latent IRAL</p> <p>Despite receiving a salary for their work, domestic workers sometimes work in only one residence; so in the case of monthly domestic workers they share conditions similar to the employed. Yet the majority are daily workers who share similar conditions to the self-employed and are not subordinated to capital, but rather to domestic production. They are thus not included in the employed category. As domestic production is a non-capitalist sector of the economy, they are included in this</p>

	study in the latent IRAL category.
Workers who produce for their own consumption	Latent IRAL This group includes small rural producers who do not produce for the market. In reality, they are an extension of the domestic production of the families who live in rural areas, that is, members of a family who dedicate themselves exclusively to producing food items for family consumption. As a result, they are included in the latent layer of the IRAL.
Construction workers who produce for their own use	Latent IRAL They are workers who are building their own house. Again, this is an extension of domestic production with some members of the family dedicating themselves to constructing their own family house. Therefore, they are included in the latent IRAL.
Unemployed	Floating IRAL This group is formed by unemployed workers who have been searching for a job in the last 30 days as registered in the PNAD data.
Non-economically active population (NEAP)	Latent IRAL This is another problematic category for Marxist analysis. The NEAP is a very heterogeneous group and its members may or may not belong to the latent IRAL: a considerable part of the NEAP is formed by children, teens and young adults who are not working and the elderly who have already retired. On the one hand, this may exaggerate the latent IRAL layer, but on the other hand it is difficult to say if these people are available in some degree to capital (it is probably very little, but grows as the young worker gets older and decreases as the older worker ages). Since they are not integrated into the capitalist sector of the economy, they are included in the latent layer of the IRAL. We make the caveat that the size of this group in the latent layer is probably exaggerated since a small part of the NEAP is probably in the lumpenproletariat and is unable to work. A considerable part of this group has less than 18 years of age or more than 60 years. To reduce the impact of the large numbers in these age groups it is possible to take them out of the PAA (Population in Active Age) and eventually verify the class divisions and the composition of the IRAL in them.

From this point on, the article will measure the Brazilian IRAL based on the analogies above with all the qualifications mentioned. Therefore, we have the following divisions of classes and segmentation of the working class in the economically active population and the IRAL and its layers in the PAA:

[Capitalists = Employers

Salaried Workers=Employed

Floating IRAL=Unemployed

Latent IRAL = Domestic Workers + Workers who produce for their own consumption + Construction workers who produce for their own use + Non-economically active population

Stagnant IRAL = Self-employed + Unpaid]

4. THE BRAZILIAN INDUSTRIAL RESERVE ARMY OF LABOR

Based on this methodology, Table 2 presents the Brazilian PAA in the 18-60 years of age group in the 2000s:

TABLE 2 – CLASS DIVISION AND THE COMPOSITION OF THE PAA FROM 18-60 YEARS OF AGE IN BRAZIL (2001-2009) (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
1.Capitalist	2.9	3.1	2.9	3.0	3.0	3.2	2.7	3.3	3.1
2.Employees	39.8	40.4	40.4	41.7	42.0	42.9	43.7	45.4	45.0
3. IRAL (total)	57.3	56.5	56.7	55.3	54.9	53.9	53.6	51.3	51.9
3.1. IRAL floating	6.9	6.7	7.3	6.7	7.0	6.4	6.1	5.4	6.4
3.2. IRAL latente	31.7	30.8	30.6	29.7	29.3	29.5	29.6	29.1	28.8
3.3. IRAL stagnant	18.7	19.0	18.8	18.9	18.7	18.0	17.8	16.8	16.7
PAA Total (thousands)	138,962	141,831	144,586	149,432	152,286	155,247	157,822	160,561	162,807

Source: PNAD. Elaboration by the author.

From Table 2 above and those to come, the percentage values deal with the size of each category in relation to the PAA, the Population in Active Age, and not the EAP, the Economically Active Population. As a result, the relative size of the floating IRAL, for example, is lower than the rate of open unemployment since the first is measured by the number of unemployed in relation to the PAA and the second is measured by the number of unemployed in relation to the EAP.

From Table 2 it is possible to extract some extra information on the evolution of the working class and the Brazilian IRAL in the 2000s. In absolute terms, between 2001-2009, there was a rise in the employed population from 55.3 to 73.3 million workers, that is, an increase of 18 million workers, which corresponded to the total EAP of countries such as

Canada or Poland in 2008 (ILO, 2013). The total IRAL went from 79.6 to 84.5 million persons, an increase of almost 5 million persons, almost the size of the total EAP of countries such as Greece or Sweden in 2008 (ILO, 2013) although there was a relative reduction of its size in relation to the labor force as a whole in the decade..

During this period, there was an absolute and relative increase in the employed population among the working class, principally from 2004 onwards, which is explained by the rise in capital accumulation in the period. To verify this, we may compare the period 1983-2003 when the Brazilian Gross Domestic Product (GDP) increased only 0.02% per year while between 2003-2010 it increased by 3.6% per year (IPEADATA, 2012). The growth in capital accumulation led to an increase in demand for labor, resulting in the increase in employed workers and a reduction in the IRAL. As such, there was a relative increase of 15% in the employed workforce between 2001-2009 and a 10% reduction in the IRAL.

It is interesting to note that in this process of the absorption of the IRAL, the floating layer did not diminish as much as expected; there was also a joint absorption of the deeper layers of the IRAL even though the relative absorption of the floating layer was more intense than the other layers. Excepting 2009, a year in which Brazil did not grow as a result of the international crisis leading to a significant increase in the floating layer of the IRAL in this particular year, the floating layer of the IRAL diminished 22% between 2001-2008, the latent layer declined by 8% and the stagnant layer by 10%.

The class division and composition of the Brazilian IRAL is not uniform in all the national territory of the country, resulting from the way capitalism grew historically. Thus, the degree of capitalist development in each region has determined different divisions of classes as well as the composition of the IRAL. The following two tables illustrate this process in two states: the most developed, São Paulo, and one of the least developed, Maranhão.

TABLE 3 – CLASS DIVISION AND COMPOSITION OF THE IRAL IN THE PAA FROM 18-60 YEARS OF AGE IN THE STATE OF SÃO PAULO (2001-2009) (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
1.Capitalist	3.3	3.4	3.4	3.1	3.5	3.8	3.1	3.6	3.1
2. Employees	44.9	45.6	45.3	47.8	48.4	49.5	51.0	52.3	51.6
3. IRAL (total)	51.8	50.9	51.3	49.0	48.1	46.7	45.9	44.1	45.3
3.1. IRAL floating	7.9	8.2	8.8	8.0	8.1	7.4	6.7	5.8	7.2
3.2. IRAL latent	30.6	29.1	29.2	28.6	27.1	27.1	26.5	26.3	25.9

3.3. IRAL stagnant	13.3	13.7	13.3	12.4	12.9	12.3	12.7	12.0	12.1
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Source: PNAD. Elaboration by the author.

TABLE 4 – CLASS DIVISION AND COMPOSITION OF THE IRAL IN THE PAA FROM 18-60 YEARS OF AGE IN THE STATE OF MARANHÃO (2001-2009) (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
1.Capitalist	0.9	2.3	1.6	1.5	1.6	2.0	1.5	2.0	2.4
2. Employees	25.6	27.1	28.3	28.2	28.7	30.0	32.2	34.4	30.9
3. IRAL (total)	73.7	70.5	70.1	70.3	69.5	68.1	66.3	63.6	66.6
3.1. IRAL floating	5.5	4.4	4.8	5.6	4.8	5.7	5.3	4.2	5.6
3.2. IRAL latent	33.8	33.5	34.1	32.6	32.5	32.9	37.8	36.9	36.0
3.3. IRAL stagnant	34.3	32.5	31.3	32.0	32.2	29.4	23.2	22.5	25.0

Source: PNAD. Elaboration by the author.

Comparing the two states, we may see that the employed population is greater in São Paulo than Maranhão with the opposite occurring in relation to the IRAL. Among the layers of IRAL, the floating is larger in São Paulo and the other layers are larger in Maranhão. This is empirical evidence that verifies Marxist theories: the rise of the salaried working class and the decline of non-capitalist sectors of the economy (and as a result the available space for the latent and stagnant layers of the IRAL) and the relative growth of the floating layer of the IRAL within the total IRAL, for example.

The data from Table 2 relate to the PAA between 18-60 years of age without distinction by sex. Some interesting results arise when this distinction is made, as the following two tables show.

TABLE 5 – CLASS DIVISION AND COMPOSITION OF THE IRAL BY MASCULINE PAA BETWEEN 18-60 YEARS OF AGE (2001-2009) (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
1.Capitalist	4.6	4.6	4.5	4.5	4.6	4.9	4.1	4.8	4.7
2. Employee	52.8	53.0	52.5	54.1	54.5	55.1	56.0	57.8	57.2
3. IRAL (total)	42.6	42.4	42.9	41.4	41.0	40.1	40.0	37.4	38.1
3.1. IRAL	6.4	6.2	6.7	5.8	5.9	5.5	5.1	4.5	5.3

floating									
3.2. IRAL latent	11.8	11.7	12.0	11.4	11.4	11.9	12.4	11.9	11.8
3.3. IRAL stagnant	24.3	24.4	24.2	24.2	23.6	22.7	22.4	21.1	20.9
PAA Total (thousands)	46.458	47.545	48.610	50.172	51.465	52.308	53.244	54.022	54.614

Source: PNAD. Elaboration by the author.

TABLE 6 – CLASS DIVISION AND COMPOSITION OF THE IRAL BY FEMININE PAA BETWEEN 18-60 YEARS OF AGE (2001-2009) (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009
1.Capitalist	1.4	1.6	1.5	1.5	1.6	1.7	1.5	1.8	1.6
2. Employee	27.7	28.6	28.9	30.1	30.4	31.5	32.3	33.8	33.5
3. IRAL (total)	70.9	69.7	69.6	68.3	68.0	66.7	66.3	64.3	64.8
3.1. IRAL floating	7.3	7.2	7.8	7.5	8.0	7.2	7.1	6.3	7.4
3.2. IRAL latent	50.2	48.7	48.1	46.8	46.0	45.8	45.7	45.2	44.6
3.3. IRAL stagnant	13.4	13.8	13.7	14.0	14.1	13.6	13.5	12.8	12.8
PAA Total (thousands)	49.787	50.847	51.940	53.871	54.835	56.015	56.956	57.647	58.634

Source: PNAD. Elaboration by the author.

These two tables highlight the following:

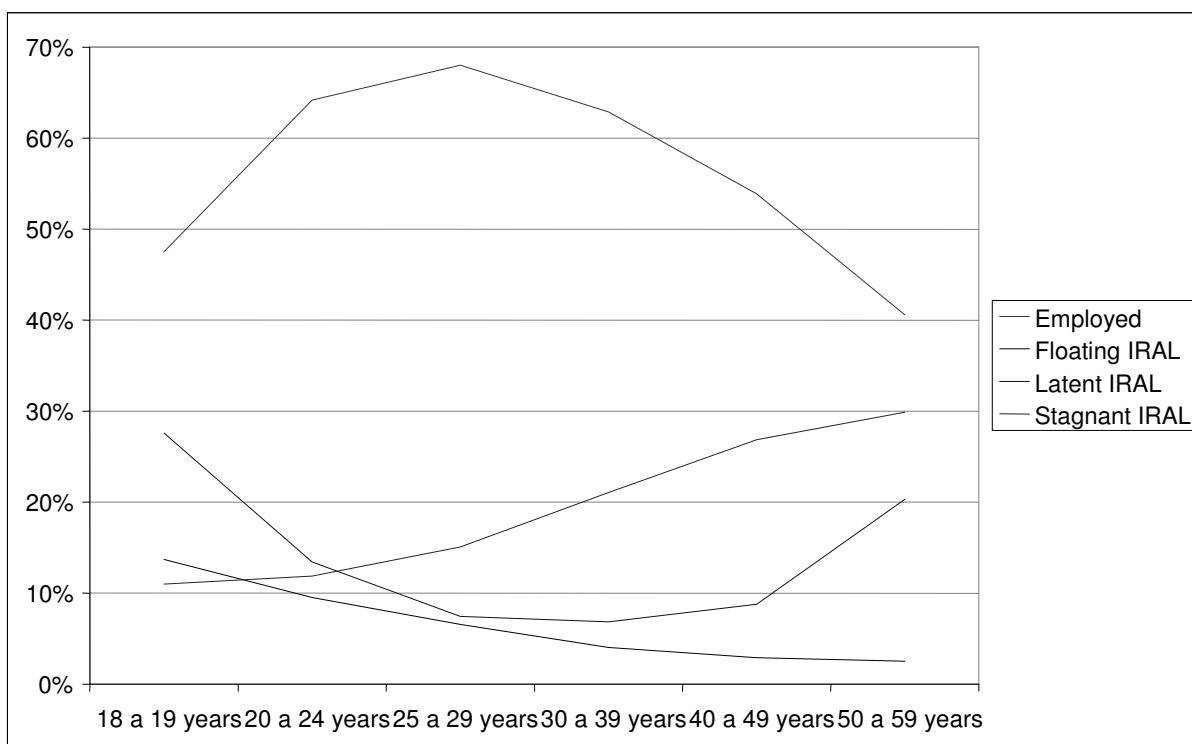
- (i) In the class division and segmentation of the working class, the data shows that the capitalist class and the employed population are majority male while the IRAL is majority female. Dealing with the question of gender is not the objective of this study, but it would be interesting to investigate the economic causes of the secondary and dominated role of women in capitalist society.
- (ii) There was an increase in the employed population and a decrease in the IRAL among both men and women, but the increase of women in the employed population and their decrease in the IRAL was higher than men. Between 2001-2009, there was a relative increase of 8% in the employed population

and a decrease of 10.5% among men while women increased 21% among the employed population and decreased only 8.5% in the IRAL.

- (iii) The floating layer of the IRAL was also higher among women than men, but there was a reduction between both sexes, but more intensely among males. Leaving out 2009 for the reasons already cited above, there was a relative decrease of 30% in the floating layer of IRAL among men and a 14% decrease among women between 2001-2008.
- (iv) In the deeper layers of the IRAL, there was also a gender division: while the latent IRAL was majority female, the stagnant IRAL was majority male. This reflects a type of division of labor between the sexes where men work in mercantile production and women in domestic and subsistence production. Between 2001-2009, there was a reduction in both layers for both sexes: the latent layer remained stable among men and decreased 11% among women while in the stagnant layer there was a 14% reduction among men and 4.5% among women.

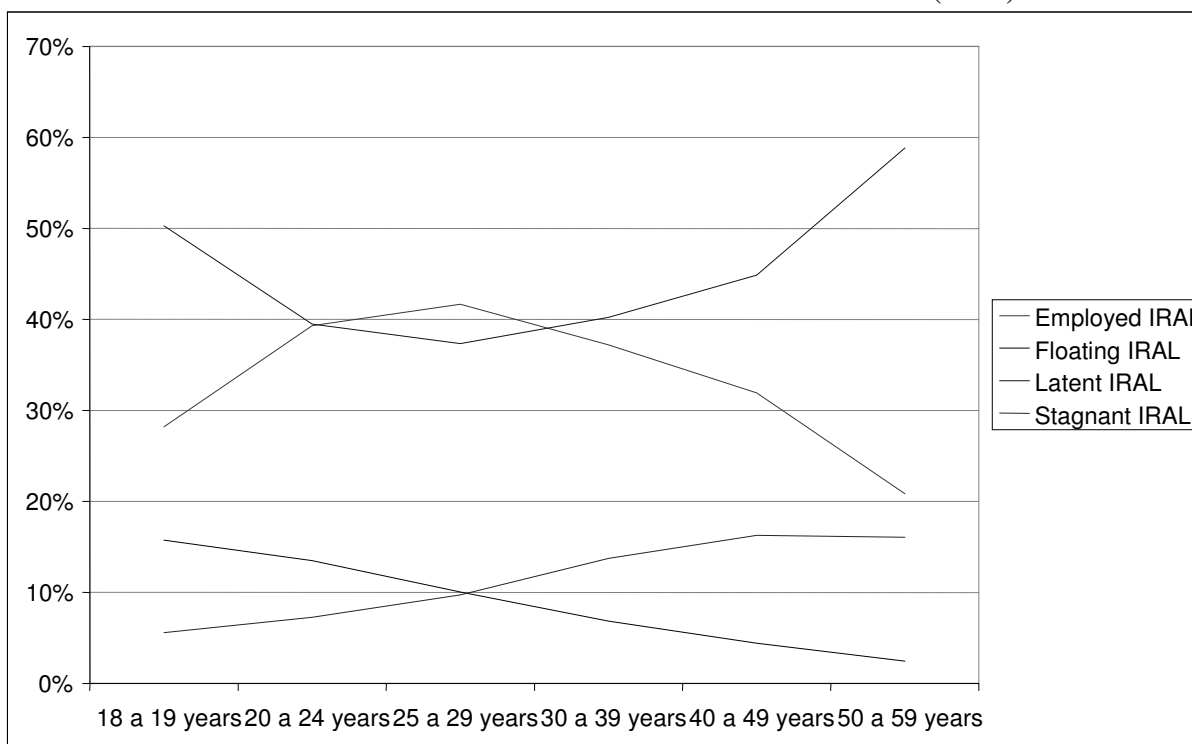
More interesting data arise when we disaggregate the PAA among age groups. The two Figures below show the division of classes and composition of the male and female IRAL by age group in 2009:

FIGURE 1 – CLASS DIVISION AND COMPOSITION OF THE IRAL BY MALE PAA BETWEEN 18-60 YEARS OF AGE AND AGE GROUPS IN BRAZIL (2009)



Source: PNAD. Elaboration by the author.

FIGURE 2 – CLASS DIVISION AND COMPOSITION OF THE IRAL BY FEMALE PAA BETWEEN 18-60 YEARS OF AGE AND AGE GROUPS IN BRAZIL (2009)



Source: PNAD. Elaboration by the author.

Figures 1 and 2 demonstrate the following phenomena:

- (i) Independently of age group, the employed population and the stagnant IRAL are majority male while the floating IRAL is majority female.
- (ii) The peak of the relative size of the employed population occurs between 25-29 years of age and from then onwards constantly falls. This shows that the objective of capital to buy the labor force is to “suck” the vital force of the worker at the peak of his or her productivity and then gradually discard them as they age.
- (iii) The tendency with the passing of age to decrease in the floating layer of IRAL and increase in the stagnant. The explanation for this phenomenon was given in the previous section: the worker cannot remain unemployed for a long time without compromising their subsistence and that of their family. They are obliged to be employed despite the precariousness of the job (such as those in the stagnant IRAL), but this resistance diminishes with age: a younger worker is more likely to find employment and generally has the help of his or her family to live if they are unemployed while an older worker has more difficulty selling his or her labor power and frequently has a family which depends on them.
- (iv) The latent IRAL shows three patterns of movement: first, it diminishes among men and women until 30 years of age; second, it maintains itself stable among men between 30-50 years of age and rises among women in the same age group; third, from 50 years of age onwards it begins to fall among both sexes. These movements are explained by three factors: a) for the first movement, the entrance of youth in capitalist production – the youth of both sexes begin to lose their dependence on their family and find work to sustain themselves, allowing them to leave the latent IRAL for other layers or to the employed population; b) for the second movement, the division of labor between the sexes; some women leave the employed population and return to exclusive domestic production while their husbands continue in the employed population or in the stagnant IRAL to financially sustain the family; c) for the final movement, from 50 years onward, both men and women retire.

To verify the evolution of class division and the composition of IRAL throughout the 2000s it is interesting to compare the situation in two specific years: 2003 and 2008. The first is important for being the last year of a 23-year long stagnation in the Brazilian GDP while the second was the fifth and last year of a period of accelerated economic development. The following two tables show this comparison.

TABLE 7 – CLASS DIVISION AND COMPOSITION OF THE IRAL OF THE MALE PAA BETWEEN 18-60 YEARS OF AGE IN BRAZIL (2003 AND 2008) BY AGE GROUP (%)

	18-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years
Capitalists (2003)	0.3	1.0	2.9	5.4	7.1	7.0
Capitalists (2008)	0.3	1.2	2.9	5.7	7.2	7.2
Employed (2003)	43.6	58.9	63.0	57.6	48.7	35.5
Employed (2008)	50.6	64.8	69.4	63.3	54.1	39.9
IRAL Total (2003)	56.1	40.1	34.1	36.9	44.2	57.5
IRAL Total (2008)	49.1	34.1	27.7	31.0	38.7	52.9
IRAL floating (2003)	13.8	11.1	7.1	5.1	4.7	3.6
IRAL floating (2008)	11.3	8.4	5.1	3.2	2.5	2.1
IRAL latent (2003)	27.3	13.5	7.1	6.3	9.4	21.4
IRAL latent (2008)	26.7	13.2	7.4	6.9	8.9	20.5
IRAL stagnant (2003)	15.0	15.5	19.9	25.5	30.1	32.5
IRAL stagnant (2008)	11.1	12.5	15.2	20.9	27.3	30.4

Source: PNAD. Elaboration by the author.

TABLE 8 - CLASS DIVISION AND COMPOSITION OF THE IRAL OF THE FEMALE PAA BETWEEN 18-60 YEARS OF AGE IN BRAZIL (2003 AND 2008) BY AGE GROUP (%)

	18-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years
Capitalists (2003)	0.1	0.4	1.0	2.0	2.3	1.7

Capitalists (2008)	0.1	0.5	1.2	2.2	2.7	2.3
Employed (2003)	21.0	32.8	34.1	32.6	29.0	17.0
Employed (2008)	28.3	40.7	42.0	37.8	31.2	21.0
IRAL Total (2003)	78.8	66.8	64.9	65.5	68.7	81.3
IRAL Total (2008)	71.7	58.8	56.8	60.0	66.1	76.8
IRAL floating (2003)	16.1	13.9	9.6	7.1	4.3	2.4
IRAL floating (2008)	14.3	11.6	8.7	5.8	3.6	1.8
IRAL latent (2003)	55.9	44.9	43.5	43.4	47.4	61.6
IRAL latent (2008)	51.2	39.9	37.8	40.6	46.3	59.0
IRAL stagnant (2003)	6.9	8.0	11.8	15.0	17.0	17.3
IRAL stagnant (2008)	6.2	7.4	10.2	13.7	16.2	16.0

Source: PNAD. Elaboration by the author.

From Tables 7 and 8, we may highlight the following conclusions:

- (i) There was an increase in employed population and a reduction of the total IRAL in both sexes and in all age groups. The most impressive results are the rise in the employed population of women between 18-30 years of age with respective increases of 34%, 24% and 23% in the 18-19, 20-24 and 25-29 years age groups. This reflects the continued incorporation of women workers by capital.
- (ii) The floating IRAL diminished drastically among both sexes and in all age groups especially among men, a direct consequence of the increase in capital accumulation and demand for labor between 2003 and 2008. The most impressive result was the reduction in the floating IRAL among men between 30-60 years of age with respective reductions of 36%, 48% and 43% in the 30-39, 40-49 and 50-59 years age groups.
- (iii) The behavior pattern of the latent IRAL was not so clear in relation to the employed population and the other layers of the IRAL. Among women there was a reduction in the latent layer in all age groups with the greatest reductions being

in the 20-24 and 25-29 years age groups whose reductions were 11% and 13% respectively. This is a reflection of the absorption of female labor by capital through reductions in domestic production. The latent layer remained stable among males with positive variances in the 25-29 and 25-29 years age groups and negative variances in the others, but always with a small total latent IRAL compared to women.

- (iv) The stagnant IRAL diminished in all age groups and in both sexes, especially among men. The largest decreases occurred among men between 18 and 40 years of age with respective reductions of 26%, 19%, 24% and 18% in the age groups 18-19, 20-24, 25-29 and 30-39 years.

5. FINAL CONSIDERATIONS

Our objective in this article was to fill a lacuna in Marxist economic theory through a detailed study of the concept of the industrial reserve army of labor. But it is worthwhile emphasizing that the field is open for future explorations as much in the theoretical development of the concept as in more rigorous and extensive empirical studies. Yet after the study developed in this article of the Brazilian IRAL, we are able to make some final conclusions.

The concept of IRAL was developed by Marx within the context of the general law of capitalist development. In this study, Marx concluded that the IRAL was the result of the accumulation of capital with the progress of productive forces which made a part of the working population superfluous, condemned to unemployment, but at the same time available to capital. In this way, capital controlled both the demand (which depended on capital accumulation) and the supply (given by the IRAL formed by capital accumulation) of the labor force, becoming a mechanism of control of the working class by capital. The IRAL is composed of a heterogeneous group and to better understand it, Marx divided it into three layers (floating, latent and stagnant) which were principally distinguished by three criteria: i) *the employment position of its components* – floating layer (unemployed workers), latent layer (workers engaged in non-market activities) and stagnant layer (workers occupied in market activities); ii) *the degree of availability of these components to capital* – floating layer (immediate availability and more demanded by capital), latent and stagnant layers (non-immediate availability and less demanded by capital); iii) *degradation of the labor power of*

its components – floating layer (less degraded and therefore with a greater potential to be exploited by capital), latent and stagnant layers (more degraded and therefore with less potential to be exploited by capital).

There are few examples in Marxist analysis of studies developed with official statistics; this is especially true with respect to measurements of the IRAL. This study therefore attempted to measure the Brazilian IRAL by using PNAD data from the 2000s. Despite the lack of rigor in the theoretical concept (since it was impossible to disaggregate all the available data) and the limitations of the extension of the study (confined to Brazil and just one decade) the results were quite interesting: i) the Brazilian IRAL varied between 51% and 57% of the labor force aged between 18-60 years of age in the 2000s and was constituted predominantly by the latent and stagnant layers. The floating layer was only a small fraction of the IRAL, approximately 12% of the total; ii) there are significant differences in the composition of the IRAL in the following aspects: a) regional – the floating layer is greater and the latent and stagnant layers are smaller in “more developed” states of the country compared to “less developed” states; (b) gender – the IRAL as a whole is greater among women than men. Yet separated in layers, the stagnant layer is greater among men and the floating and latent layers greater among women; and (c) age – the peak of the employed labor force occurs between 20-30 years when the worker is at their peak vitality and with little degradation in their capacity to work. There are thus more young workers concentrated in the floating layer while older workers dominate in the stagnant layer of the IRAL.

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