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El decrecimiento de las relaciones laborales formales y los efectos en la sostenibilidad del sistema de seguridad social brasileño

The degrowth of formal labor relations and the effects on the sustainability of the Brazilian Social Security system

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Resumen

Este artículo tiene como objetivo presentar reflexiones sobre la configuración actual del mundo del trabajo en Brasil y el aumento del desempleo y la informalidad, analizando, por tanto, cómo se produce el fenómeno de la disminución de las relaciones laborales formales, explorando, a partir de ahí, cómo este Este escenario impacta la sostenibilidad del sistema de pensiones brasileño. Se utilizó el método deductivo para analizar el impacto de la disminución de las relaciones laborales formales en Brasil sobre el sistema de seguridad social, y se encontró que la disminución de las relaciones laborales formales pone en riesgo la sostenibilidad del sistema de seguridad social, ya que existe un descenso de cotizantes a la Seguridad Social, que tiene un carácter esencialmente contributivo.

Palabras clave

informalidad; desempleo; seguridad social; principio de solidaridad

Abstract

The article examines the current situation of the labor market in Brazil, highlighting the increase in unemployment and informality. It analyzes the decline in formal labor relations and investigates the consequences of this trend for the sustainability of the Brazilian social security system. The deductive approach was employed to examine the effects of the decline in formal labor relations in Brazil on the social security system. This decline compromises the sustainability of the social security system, owing to a reduction in the number of contributors, given the system is fundamentally contributory.

Keywords

informality; unemployment; social security; principle of solidarity

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1. INTRODUCTION

Labor relations, as now defined, have not consistently had the same structure and have experienced several transformations over time. Society is ever evolving.

Currently, emerging technologies are spreading rapidly, redefining societal living and interaction. The digital era introduces new requirements and demands transformations, primarily impacting the socio-economic scenario in which it is embedded.

The labor market in Brazil is similarly affected. The evolving technology context has transformed the perception of labor relations, resulting in a reconfiguration of the labor market.

The digital age unequivocally enhances society across several sectors by resolving challenges and expediting production processes, due to the advancement of available technologies. The worry is to whether technological advancements and the changing nature of work are creating new societal dangers and socio-economic challenges, in addition to its benefits, including the decline of both formal and informal labor relations.

These socio-economic issues and social risks can substantially impact other equally vital sectors, especially the workforce. The Social Security system, the primary mechanism for protecting workers, may have detrimental impacts that jeopardize its viability, stemming from inadequate management of the evolving labor scene and the socio-economic challenges it generates.

This study will examine the decrease in professional relations in Brazil, investigating its intricacies and the consequent effects on the sustainability of the Brazilian social security system.

The initial section will analyze the institute of governance that the state must implement, demonstrating that effective governance is crucial for sustainability, economic development, and the welfare of citizens, based on the premise that social responsibilities should be considered alongside economic objectives.

The second section will offer insights into the present situation of the labor market in Brazil, highlighting the increase in unemployment and informality, while introducing the concept of the Fourth Industrial Revolution and its relevance to the current socio-economic scenery. It will also address labor legislation and present research data pertinent to the analysis.

Ultimately, this study will examine how the scenario of unemployment and informality, and consequently the decline in formal labor relations, affects the sustainability of the Brazilian social security system, through an analysis of the principle of solidarity and adherence to financial and actuarial balance.

The hypothesis claims that the reduction in Social Security contributors, which is fundamentally important, is closely correlated with a decrease in formal labor relations, thus threatening the sustainability of the social security system.

In this paper, we use the deductive approach to examine the effects of the decrease in formal labor relations in Brazil on the social security system. This study aims to establish a logical argument regarding the consequences of the decline in formal labor relations in Brazil on the sustainability of Social Security, starting with general premises about the impact of technology on contemporary society, the increase in unemployment, and trends towards informality, including in labor legislation.

2. SUSTAINABILITY, ESG AND SUSTAINABLE LOCAL DEVELOPMENT

The acronym ESG stands for environmental (E), social (S), and governance (G), which relate to environmental, social, and governance issues, respectively. Carroll is regarded as a pioneer in this domain, having claimed in 1979 that businesses had to consider social duties beyond their self-interests.

Li, Wang, Sueyoshi, and Wang illustrate the significance of ESG in the corporate sector:

> ESG is generally a standard and strategy used by investors to evaluate corporate behavior and future financial performance. As an investment concept for assessing the sustainable development of companies, the three basic ESG factors are the key points to consider in the investment analysis and decision-making process. In addition, environmental, social and governance (ESG) factors help to measure the sustainability and social impact of business activities. (Li, Wang, Sueyoshi and Wang, 2021, p. 11663)

The environmental conferences introduced the term "sustainable development," which subsequently developed into three pillars: social, environmental, and economic. According to Leal and Silva (2023), this progression resulted in the term "sustainability," as sustainable development is immeasurable, whereas sustainability is measurable. Silva (2023) notes that the sustainability theme has become increasingly prominent across all corporate sectors.

As corporations have focused on this matter, sustainability must be an aim sought in all operations of Public Administration, including the social security system. Public policies must be formulated and enhanced with an emphasis on citizen service, effective administration, and optimal utilization of available resources.

According to Joenck (2023), public administration must focus on choosing techniques that aim to:

> increase the likelihood that strategic objectives will be achieved and institutional deliveries will take place, and should therefore include an environmental and social concern, along the lines of what is already being developed by public companies, driven by the ESG approach - environmental, social and governance, which is in full use by the private market. (Joenck, 2023, p. 16)

Effective governance is crucial for every community aiming to enhance economic progress and the welfare of its population. Governance fundamentally relates to the capacity to establish societal objectives and develop initiatives to realize them, so benefiting the entire community. According to Hovarth Júnior (2024), governance enables the state to fulfill its duties, especially during periods of limited resources.

Decree 9.203, dated November 22, 2017, established the governance policy within the Federal Public Administration, describing it as follows:

> Art. 2 For the purposes of this Decree, the following shall be considered:
>
> I - public governance - a set of leadership, strategy and control mechanisms put in place to evaluate, direct and monitor management, with a view to conducting public policies and providing services of interest to society;

The Decree establishes six principles of public governance: responsiveness, integrity, reliability, regulatory improvement, accountability, and transparency.

The Public Governance Policy Guide summarizes it as follows:

> Therefore, the idea of improving governance is nothing more than the idea of improving the institution, of preparing it to better serve the public interest, of creating an institutional environment capable of generating and delivering results, of finally having a governance model that is better suited to the context. (Guide to public governance policy, 2018, p. 17)

Conversely, public activities devoid of legitimacy sometimes yield legislation and regulations that are more expensive to enforce due to insufficient voluntary compliance. This undermines citizens' confidence in the organization, perpetuating a detrimental looping process of reciprocal distrust, which contributes to bureaucracy and encourages non-compliance (Public Governance Policy Guide, 2018).

It is important to consider public governance through the lens of the United Nations' Sustainable Development Goals (Agenda 2030). In this context, SDG 16 is prominent: "Promote peaceful and inclusive societies for sustainable development, ensure access to justice for all, and establish effective, accountable, and inclusive institutions at all levels." This goal is relevant:

> 16.6 Develop effective, accountable and transparent institutions at all levels.
>
> 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.[4]

Consequently, the emphasis on optimal resource utilization and institutional efficiency is a global issue, which has been formally recognized in Brazil through Decree 9.203/17, requiring attention to ensure that society collectively benefits from state actions.

In the context of social security, Hovarth Júnior (2024) asserts that effective governance enhances the sustainability of social security systems by enabling their adaptation to demographic, social, or economic changes, while consistently pursuing efficient financial resource management through requisite adjustments.

Effective governance is essential, particularly in social security, to guarantee system transparency and efficacy, while also fostering social protection and prudent resource management.

3. THE NEW MORPHOLOGY OF THE WORKING ENVIRONMENT DUE TO THE IMPROVEMENT OF ICT AND LABOR LEGISLATION

It is well acknowledged that society is ever evolving; nonetheless, over the millennia, certain transformations have instigated profound revolutions in human behavior and social organization. This section's examination centers on the impact of a 20th-century industrial revolution that enabled mass manufacturing, significantly altering the prevailing labor practices of the time.

[4] SDG 16. Available at : https://gtagenda2030.org.br/ods/ods16/#:~:text=Objetivo%2016.%20Promover%20sociedades%20pac%C3%ADficas%20e%20inclusivas%20para,institui%C3%A7%C3%B5es%20eficazes%2C%20respons%C3%A1veis%20e%20inclusivas%20em%20todos%20os%C2%A0n%C3%ADveis accessed on August 24, 2024.

The advent and advancement of technology in recent decades have precipitated significant societal transformations, sometimes characterized as the fourth industrial revolution, or Industry 4.0.

Schwab (2016) asserts that the escalating sophistication, integration, and enhancement of technologies in the fourth industrial revolution enable global collaboration between physical and virtual manufacturing systems, facilitating the rapid and extensive dissemination of emerging technologies and innovations throughout society, thereby instigating significant transformations in social and economic frameworks.

The advantageous impacts of technical advancements and process digitalization are indisputable, helping society across all industries. Nevertheless, amid the relentless progression of the digital era we are witnessing, despite human beings' potential for adaptation, a pertinent inquiry emerges: Is society collectively mastering new technologies and leveraging them to its benefit, or is the fourth industrial revolution engendering detrimental effects and social risks?

According to Schwab (2016), the fourth industrial revolution requires a reevaluation of economic, social, and political systems to facilitate the dissemination of innovations and reduce disruptions; however, he claims that the state currently lacks adequate comprehension of these changes to accomplish this.

According to Hovarth Júnior (2024), the Fourth Industrial Revolution significantly transforms the labor market and work activities, generating new social dangers that directly impact the socioeconomic condition of the state.

Ibrahim and Almeida (2020) assert that the fourth Industrial Revolution requires alterations in work methodologies, leading to labor extinction and decrease, as well as the emergence of new professions; hence, these transformations must be effectively handled to prevent heightened inequality and social regression. Similarly, Hovarth Júnior (2024) argues that the fourth industrial revolution results in the substitution of both manual and cognitive labor by emerging technology, culminating in two forms of work relocation: individual replacement and total worker exclusion.

Schwab highlights a significant correlation between unemployment and technology:

> There are roughly two opposing camps when it comes to the impact of emerging technologies on the labor market: those who believe in a happy ending - workers displaced by technology will find new jobs and technology will unleash a new era of prosperity; and those who believe that fata will lead to a progressive social and political Armageddon, creating a massive scale of technological unemployment. History shows us that the likely outcome is somewhere in the middle between the two camps. The question is: What can be done to promote more positive outcomes and help those caught in the transition? (Schwab, 2016, p. 42)

In Revolution 4.0, those who retain their positions possess skills aligned with the digital era, whilst those with lower credentials and less capacity to adapt to technological advancements in real time are marginalized (Hovarth Júnior, 2024).

Schwab (2016) discusses the potential shift towards flexible employment, which could be transformative due to technological advancements, or conversely, result in the emergence of a "precariat" class comprising informal workers who transition between jobs in pursuit of subsistence, entirely outside the realm of labor rights.

Consequently, with this transformative technical advancement and the reduction in employability, a trend of work insecurity is emerging in the remaining positions.

Kremer and Faria (2005) define job insecurity as the deterioration of working and employment circumstances, characterized by low wages and diminished rights, which has become the prevailing situation for workers in Brazil's primary industrial chains.

The availability of jobs is not the sole issue with employment in Brazil; the quality of jobs is also a significant element. The instability of these positions therefore results in informality (Neri; Fontes, 2010).

The present condition of the labor market is attributable to a sequence of events, beginning with advances in technology, succeeded by reductions in employment and the instability of available positions which fosters the informal sector and initiates a chain reaction.

Alongside the fourth industrial revolution, additional factors also contribute to the emergence of insecure employment and the inclination towards informality. In Brazil, labor policy has experienced significant alterations and flexibilizations in recent years, perceived as adverse to workers. The labor reform of 2017 - legislation 13.467/2017 - clearly illustrated changes to both substantive and procedural legislation, diminishing rights and rendering formal labor interactions more unstable.

One modification relates to the establishment of the intermittent worker designation, as stipulated in the Consolidation of Labor Laws (CLT):

> Art. 443. Individual employment contracts may be agreed tacitly or expressly, verbally or in writing, for a fixed or indefinite term, or for intermittent work.
>
> § 3o An intermittent employment contract is one in which the provision of services, with subordination, is not continuous, occurring with alternating periods of provision of services and inactivity, determined in hours, days or months, regardless of the type of activity of the employee and the employer, except for aeronauts, who are governed by their own legislation.

Workers employed in this manner may endure prolonged periods, spanning days or even months, without engaging in labor or generating cash, and may get compensation below the minimum wage. Furthermore, during intervals of inactivity, this worker may provide services to other contractors, paralleling Schwab's earlier reference to the "precariat."

This contractual mode contradicts labor regulation, which identifies non-permanence as a basic criterion of the labor relations.

Zimmermann (2018) argues that intermittent employment contributes to the rise of informality, as these individuals, when not summoned by their contractor, tend to pursue alternative activities to augment their income.

According to Leite and Leite (2018), intermittent work is deemed unconstitutional, representing a clear instance of the exploitation of human labor, reducing the worker to the status of a disposable machine, which contradicts the constitutional principles of fostering citizenship and enhancing the social conditions of workers.

The legislature later legitimized the phenomenon of outsourcing after the Labor Courts initially rejected it in Law 6.019/1974:

> Art. 4-A. The provision of services to third parties is considered to be the transfer by the contracting party of the execution of any of its activities, including its main activity, to a legal entity under private law providing services that has the economic capacity compatible with its execution.

Promoting outsourcing constitutes a regression for workers, particularly as Zimmermann (2018) indicates that outsourced employees earn 30% less than direct staff, and it is well-documented that outsourced firms often vanish while owing millions to Social Security and other labor obligations.

Ajouz (2018) asserts that outsourcing advantages the business by lowering expenses, but for the employee, it signifies insecure working circumstances and, in effect, serves as a mechanism for increasing labor flexibility.

The labor reform includes a change that could put workers' rights at risk by letting negotiated agreements take precedence over legally binding provisions in certain situations set by the legislator. This means that collective agreements and conventions can be more important than the law, even if they lower workers' rights.

Additionally, Zimmermann (2018) says that the law allows, subject to the terms of the collective agreement or convention, lowering normal wages to the national minimum, changing what constitutes unhealthiness, and labeling money benefits as indemnities, which means they won't have an impact on labor funds or social security goals.

The existing labor policy fosters significant precariousness in working conditions and employee rights, serving as a substantial catalyst for the proliferation of informal employment, so leading to a standardization of informality.

Kremer and Faria (2005) indicate that initiatives to address informal work and integrate these individuals are lacking, resulting instead in a decline in the working and employment circumstances of formal workers.

Neri and Fontes (2010) specifically observe that informality is more prevalent and persistent than unemployment in the informal sector, which is the primary contributor to poverty rates in Brazil, as individuals in this sector typically earn lower incomes insufficient to support their families.

Similarly, Vaz (2020) indicates that employees in formal employment benefit from legal protections and often earn greater wages, since the informal sector generally exhibits lower income levels and educational attainment.

Concerning unemployment and informality in Brazil, the following PNAD/IBGE poll was conducted in 2019 and published in 2020:

> The average unemployment rate fell from 12.3% in 2018 to 11.9% in 2019, the second consecutive annual drop, according to the Continuous National Household Sample Survey (PNAD Contínua), released today (31) by the IBGE. The survey revealed that 12.6 million people were unemployed last year, 1.7% less than in 2018. However, compared to the lowest

> point in the series, when it reached 6.8 million in 2014, the jobless population almost doubled, growing 87.7% in five years.
>
> Informality - the sum of workers without ID cards, domestic workers without ID cards, employers without CNPJs, self-employed without CNPJs and auxiliary family workers - reached 41.1% of the employed population, equivalent to 38.4 million people, the highest figure since 2016, despite the stability compared to 2018.

Despite a decrease in unemployment figures, this does not indicate a rise in formal employment, as the population of informal workers has surged significantly.

Another poll by the PNAD/IBGE, which primarily attributes this association to the decrease in the population contributing to social security, shows a clear correlation between the decline in unemployment and the rise in informality.

> Research analyst Adriana Beringuy explains that there is a relationship between the increase in the country's employed population and the rise in informality.
>
> "Even with the drop in unemployment, in several states we can see that the rate of informality is higher than the growth in the employed population. In Brazil, of the increase of 1.819 million employed people, one million are informal workers," explains Adriana. "In practically the whole country, it is informality that has sustained the growth in employment," she observes.
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> [...]
>
> "We can see that the growth of the contributing population is not keeping pace with the growth of the employed population as a whole. While the employed population increased by 2%, the number of social security contributors only grew by 1.7%," Adriana points out. "As we've already seen, the growth of the employed population is based on informality. And informal work reduces social security contributions," she adds.

From the perspective of social security, as noted by Vaz (2020), informal workers are technically classified as compulsory contributors to the system; nonetheless, due to their lack of legal labor relations, they remain excluded from the social security framework.

This situation of elevated unemployment rates and heightened informality adversely affects not only the Brazilian socio-economic context, as previously noted, but also the social security system, given its implications for social security.

The current labor market configuration, characterized by unemployment and informality, influenced by technological advancements, worker unpreparedness, and labor laws that promote informal employment, poses a potential threat to workers' social protection due to the lack of social security contributions, which may jeopardize the sustainability of the social security system, as will be elaborated upon subsequently.

This analysis will examine how the evolving context of employment and the decline in formal job links, stemming from rising unemployment and informality, impact Social Security, the primary protection for Brazilian workers facing social risk.

4. THE IMPACT OF SOCIAL SECURITY ON THE SUSTAINABILITY OF THE SOCIAL SECURITY SYSTEM IN BRAZIL

Initially, it is essential to examine the fundamental aspects of the Brazilian social security system to comprehend its structure and purpose.

The General Social Security System is regarded as a fundamental component of the Brazilian social protection framework, characterized by its contributing structure and mandatory enrollment for employees. Moreover, as Amado (2020) elucidates, it operates as a pay-as-you-go system, including a singular fund designated for the disbursement of social security payments, whereby current workers finance the benefits of those who are retired.

Couto Neto (2021) asserts that Social Security functions like to insurance, relying on mandatory payments from workers or voluntary participants, and is designed to address social contingencies impacting contributors by providing benefits.

This protection scheme is designed to shield the insured or their dependents from social risks that impair the contributor's capacity to work, ensuring an income to substitute their wage.

The principles regulating Social Security are enumerated by the parliament in Law 8.213/1991, which states the following:

> Art. 2 Social Security is governed by the following principles and objectives:
>
> I - universal participation in pension plans;
>
> II - uniformity and equivalence of benefits and services for urban and rural populations;
>
> III - selectivity and distributivity in the provision of benefits;
>
> IV - calculation of benefits based on corrected contribution salaries
>
> V - irreducibility of the value of benefits in order to preserve their purchasing power;
>
> VI - the value of the monthly income of benefits replacing the insured person's contribution salary or income from work is not less than the minimum wage;
>
> VII - optional supplementary pension plan, funded by an additional contribution;
>
> VIII - democratic and decentralized administrative management, with the participation of the government and the community, especially active workers, employers and retirees.

Alongside the principles established in the legislative framework, the theory posits that there are other principles, inherent in the Brazilian Social Security system, that are equally significant as those articulated by the legislature.

The notion of solidarity is fundamentally relevant to this research, as it is essential to the functioning of Brazil's pay-as-you-go social security system.

This concept imposes a duty on all individuals inside the system to participate, with society collaborating to sustain the system throughout time, especially for future generations, therefore fostering intergenerational solidarity.

Moraes (2013) elucidates that the present beneficiaries of the system are financed by current taxpayers, who will thereafter be supported by future generations of taxpayers when they become beneficiaries.

A generational contract exists, wherein current workers finance the social security benefits of retired workers, who, in turn, contributed to the benefits of a previous generation during their employment (Couto Neto, 2021).

Amado (2020) asserts that the idea of solidarity underpins social security, facilitating the socialization of risks across society to safeguard individuals during periods of necessity.

The essence of solidarity is evident in the requirement for contributions to the system, even from insured individuals who have retired after a lengthy contributory history, should they continue to work. This is pertinent as an insured person may, at the onset of their contributory life, be compelled to retire due to a misfortune resulting in disability (Amado, 2020).

Equally significant as the unity inherent in the system is its sustained financial viability. The constitution mandated that social security provisions ensure financial and actuarial balance, stating: *"Art. 201. Social security shall be organized as the General Social Security System, which shall be contributory and compulsory, adhering to criteria that maintain financial and actuarial balance."*

According to Amado (2020), financial and actuarial equilibrium ensures the stability of social security accounts for all insured generations by maintaining a balance between fund inflows and benefit expenditures, alongside the necessity for monitoring and analyzing trends and social factors that may disrupt this balance in the future.

The assertion that the active contributor, alongside the state and the employer, aids the insured who no longer contributes, and that there exists a cycle of dependence between current and future generations, implies that for the financial sustainability of the system, the economically active population must consistently outnumber the inactive population.

In Brazil, we are currently observing a phenomenon known as demographic transition, which is characterized by declining birth rates and an aging population. According to Hovarth Júnior (2024), this trend directly impacts Social Security, as it results in fewer contributors to support the pay-as-you-go system.

According to Vaz (2022), demographic transition is a big structural change that has put the welfare state at risk since the second half of the 20th century. This is because the age pyramid imbalance changes the relationship between public revenue and social expenditure, making the working generation pay for the social insurance of the older generation.

Data from the IBGE[5] indicates that in 1980, Brazil's population aged 65 and over constituted 4.0%, but in 2022, the Census recorded this demographic at 10.9% of the total population. According

[5] Available at: https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/38186-censo-2022-numero-de-pessoas-com-65-anos-ou-mais-de-idade-cresceu-57-4-em-12-anos Accessed on: August 17, 2024

to these statistics, the proportion of children under 14 years of age increased to 19.8% in 2022, a significant decline from 38.2% in 1980.

The data from the top of the pyramid, advanced age, should ideally always be lower than its base, without any balance or even inversion, in order for the population of taxpayers to stay greater than the older, inactive population. Nonetheless, the escalating imbalance of the age pyramid is increasingly concerning, as data from Amado (2020) indicates that, under current legislation, it is projected that by 2050 there will be only one active taxpayer for every inactive individual, a ratio that currently is three to one.

In addition to the concerning demographic background, another factor directly affecting the viability of the social security system is the present labor market situation and formal employment ties. The unemployment rate and the shift towards informality, previously identified in this study as underlying issues in the Brazilian economic scenario, are closely correlated with the decline of Social Security contributors

Vaz (2022) also claims that this issue is central to the social security dilemma and is more concerning than demographic transition. Even with a younger population surpassing the elderly, a stagnant increase in formal employment will lead to a decline in contributors and, consequently, a reduction in social security revenue.

As per Agostinho (2020), social security revenues consist of 1) employer payments based on payroll; 2) employee contributions, determined by wage rates; and 3) contributions from the Union, derived from social contributions and tax revenues.

Two-thirds of the resources supporting Social Security depend on non-formal paid activities and formal labor relations, which violates the current structure of formal labor relations.

The increasing informality in the labor sector is a major element undermining the sustainability of social security. Despite having income, a sizable portion of workers are subject to informal agreements and do not contribute to the system (Moraes, 2013)

Hovarth Júnior (2024), previously referenced for his caution regarding the escalating substitution of labor by emerging technologies—thereby exacerbating unemployment—also emphasizes that Social Security is primarily funded by economic growth and the labor market. Consequently, the reduction of employment significantly impacts the diminishing availability of the system's financial resources.

Vaz (2022) posits a reciprocal link between employment and social security, asserting that job and income are essential for the sustenance of any social security system. Consequently, the most pressing issues currently are the rise in unemployment and informality, which, if unresolved, will persist in jeopardizing the viability of Social Security and impose burdens on subsequent generations who will suffer the expenditures incurred by their predecessors.

As a result, a big part of the population is left out of the social security system because of how the job market is changing. This is because they are either self-employed, working informally without formal contracts, or unemployed, which threatens the system's ability to work well and keep its balance.

This is additionally what Cereza articulates:

> In this order, the new social security conception, in which the primacy of work has taken on new directions, does not find full social protection, where, amidst the growing informality of unemployment, thousands of citizens find themselves on the margins of society without any kind of benefit, be it social security or welfare. (Cereza, 2022, p. 80)

It is important to note that, in addition to the decline in formal employment, the precarious nature of the remaining jobs directly affects the social security system. Workers with lower salaries, despite being formally employed, contribute less, thereby diminishing Social Security revenue.

Ajouz (2018) identifies the primary risk factors affecting the operation of social security as diminished revenue collection, evasion of payments, and the erosion of protection for insured individuals.

Cherulli (2018) asserts that it is a reasonable deduction that individuals with lower contributions always result in an actuarial imbalance, particularly as this phenomenon amplifies the risk that the system must safeguard against.

The instability of employment is intricately connected to both the difficulties posed by technology advancements and the prevailing labor norms. Cherulli (2018) claims that the labor reform, which is a big reason for job insecurity and working without a permit, only looks at economic needs and ignores legal and social issues. This is a step backwards, especially when it comes to outsourcing and temporary work, which puts the social security system at risk.

Intermittent employment exemplifies insecure labor, directly affecting Social Security, as it often leads to informality or, at most, little contributions. Let us examine a tangible illustration of this scenario:

> So let's imagine an intermittent worker who is paid per hour of work, the minimum value of which in 2018 is R$4.34 (four reais and thirty-four cents). If he works 40 (forty) hours in a given month, which corresponds to 5 (five) days of work, he will only receive R$ 177.20 (one hundred and seventy-seven reais and twenty cents).
>
> The employer will pay a social security contribution of 20% of the remuneration paid and the intermittent employee, in this case, will also have 8% deducted from the payroll, resulting in an amount of R$ 163.04 (one hundred and sixty-three reais and four cents), i.e. less than the proportionality of the minimum hourly wage.
>
> As if that weren't enough, the tiny salary that the intermittent employee will receive means that they will also have to pay R$62.14 (sixty-two reais and fourteen cents), corresponding to 8% (eight percent) of the difference between the salary they receive and the monthly minimum wage, which is the requirement for them to have computed their contribution time, including to maintain their status as an insured member of the General Social Security System and satisfy the waiting period for social security benefits.
>
> In the example in question, therefore, only R$100.09 (one hundred reais and nine cents) would be left for the intermittent employee to pay for the maintenance of his subsistence and that of his family with basic expenses such as housing, food, education, health, leisure, clothing, hygiene and transportation.

> It is therefore unavoidable to conclude that employees who earn less than the minimum wage each month will be indirectly obliged to opt out of paying the supplementary social security contribution otherwise, they will be jeopardizing the existential minimum advocated by the Constitution. (Leite e Leite, 2018, p. 176-177)

Consequently, it is an issue that must be collaboratively addressed by the state and society to identify methods that ensure the sustainability of Social Security, while mitigating unemployment and informality, particularly within the framework of Revolution 4.0.

5. RESULTS AND DISCUSSIONS

This scenario illustrates that technological advancements and the evolving nature of work are generating new social risks and socio-economic challenges in Brazilian society, including a decrease in both formal and informal labor relations, which directly affects the sustainability of the social security system.

The data regarding unemployment indicates that its reduction alone does not facilitate an optimistic outlook for the Brazilian socio-economic scenario or a decrease in Social Security expenditures. In reality, a significant portion of the previously unemployed population is not transitioning into formal employment that would enable them to contribute to the system and secure labor or social security rights; instead, they are shifting to informal activities devoid of any social protection.

Neri and Fontes provide strategies for addressing informality.

> Given its complexity, tackling informality must be done through a set of measures of different kinds. An isolated action is unlikely to have an effective impact on reducing informality. Proof of this is the fact that the generation of formal jobs in recent years has required a series of favorable conditions, both in terms of macro and micro aspects, such as economic growth, greater schooling of the population, more efficient inspection actions, innovations in labor legislation and incentives for the formalization of micro and small companies.
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> [...]
>
> Measures to combat unregistered employment are related to retraining workers to become formally employable and to inspection and monitoring actions. Policies aimed at micro-entrepreneurs, including the self-employed, should prioritize an integrated set of policies aimed not only at regularizing these activities, through incentives for formalization, but also access to markets and increased productivity. In general, it is necessary to recreate the relationship patterns between the state and society, offer the right incentives and reduce information asymmetries (Neri; Fontes, 2010, p. 29).

Balera and Silva (2020) assert that a struggling economy adversely affects the social realm; hence, a balance between economic and social growth is essential for social security to fulfill its objectives of well-being and social justice.

In this context, concerning the impact of technology—and consequently the fourth Industrial Revolution—on the Brazilian socio-economic scenario, it is imperative to identify mechanisms that

prioritize human value over the excessive emphasis on technology, aiming for a humanization of this Revolution (Hovarth Júnior, 2024).

According to Hovarth Júnior (2024), sustaining social protection systems necessitates the implementation of fair globalization, which entails harmonizing global economic and social integration with the preservation of social protection. This will be accomplished through several measures, including enhancing laws to fortify social protection, particularly for social security, education, and employment generation, as well as modifying labor regulations to adhere to principles such as decent work and equitable salaries.

Ibrahim and Almeida (2020) assert that the fourth Industrial Revolution is necessitating transformations across all domains of social protection, including labor regulation, social security adaptation, enhancement of social security, educational adjustments, and advocating for the universalization of social security independent of formal employment.

Schwab (2016) asserts that it is imperative to overhaul social, economic, and political systems, as the existing frameworks are inadequate to address the needs of both the present and future generations, necessitating innovation and systemic transformations rather than mere modifications or reforms.

The state must take on a number of components and actions in order to resolve the issue, with the social criterion taking precedence over the economic one.

6. CONCLUSION

The analysis conducted concludes that 1) the ongoing 4.0 revolution significantly influences the Brazilian socio-economic scenario, particularly the labor market; 2) technological advancements have transformed the work environment, prioritizing technology over human labor, resulting in job reductions and increased precariousness, which further exacerbates informality; 3) current labor legislation exacerbates job insecurity and promotes the informal sector by diminishing and relaxing workers' rights; and 4) unemployment and informality are indicators of a socio-economic crisis that adversely affects social security, jeopardizing the sustainability of the system, as the decline in formal employment leads to fewer contributors to the predominantly contributory social security framework.

Consequently, the hypothesis posited at the outset of this study is validated; there exists a direct correlation between labor market conditions and the sustainability of social security, as well as the fulfillment of its intended objectives, particularly concerning unemployment and informality. This is especially pertinent in the realm of social security, which predominantly relies on the ongoing integration of new contributors into its framework.

Given the social security system's strong connection to the formal labor market, it is imperative to manage the social risks associated with Revolution 4.0, particularly with the mitigation of unemployment and the inclination towards informality, to extricate people from social security uncertainty.

State action must implement effective governance and recognize the necessity of restructuring its processes to accommodate the new reality. In the domains of labor and social security, it is essential to cultivate the formal labor market and invest in the training of Brazilian workers, while also amending pertinent legislation to address not only economic requirements but primarily social

imperatives, thereby enhancing the protection and valuation of workers and ensuring the sustainability of Social Security.

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