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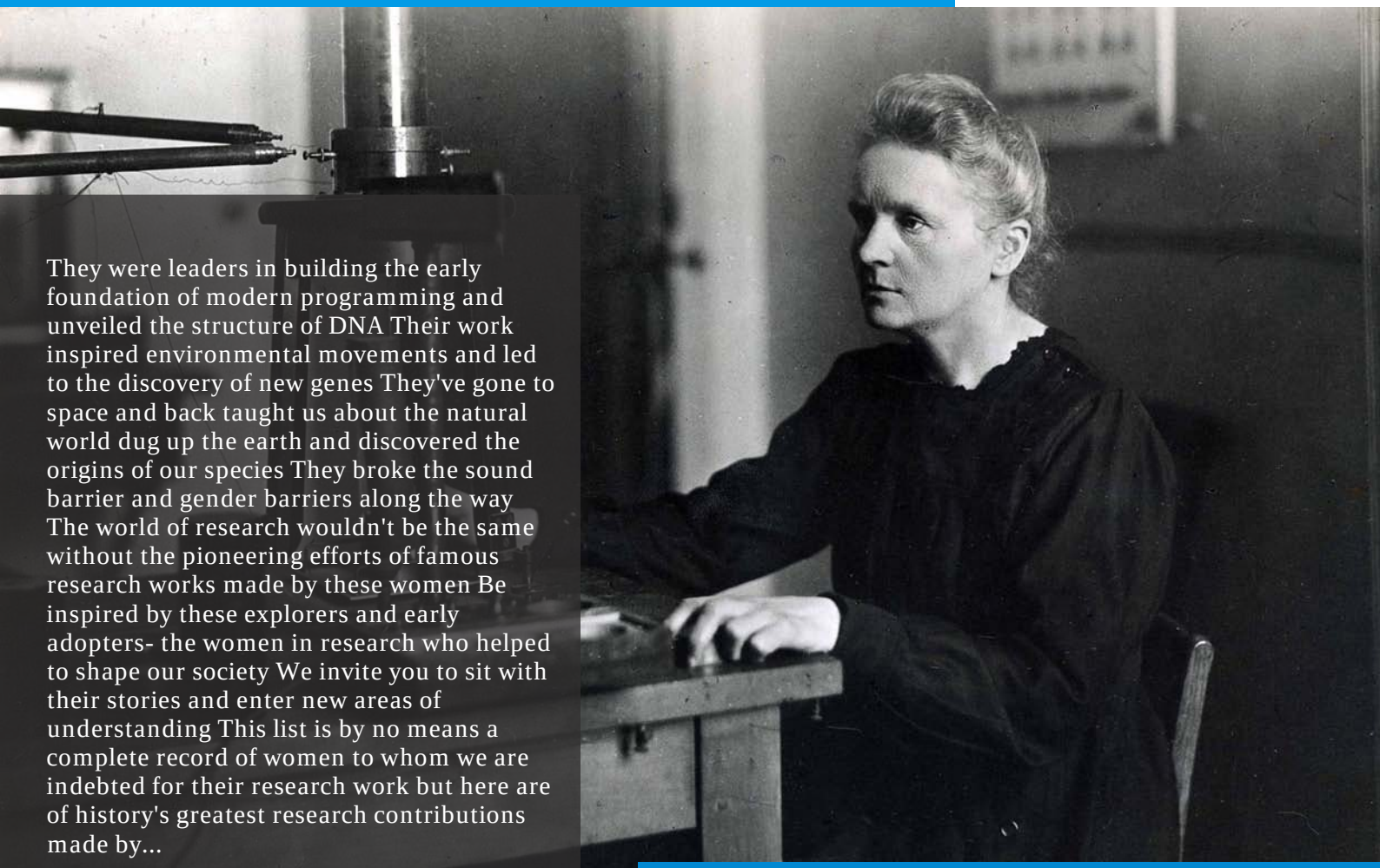

They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

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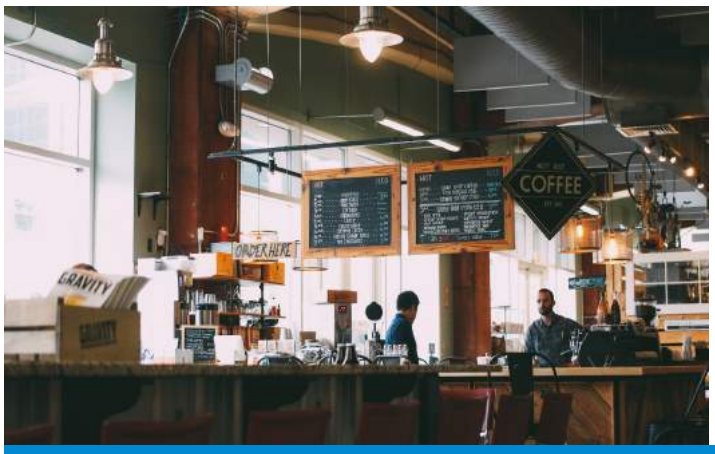

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CSR and Its Alignment with uses in 21st Century with Technology Advancement and Betterment

Anish Devale & Dr. Shabnam Mane Mahat

Deemed to be University

ABSTRACT

Thanks to new technologies and rising consumer interest in environmentally responsible company operations, the concept of corporate social responsibility (CSR) has changed dramatically in the modern era. Incorporating digital innovation to improve social and environmental conditions, CSR has evolved from an emphasis on charity and compliance into a strategic undertaking. In order to make their CSR programs more open, efficient, and effective, companies are using new technologies like blockchain, cloud computing, renewable energy, and artificial intelligence (AI). By looking at four market leaders—Microsoft, Google, IBM, and Tesla—this study investigates how CSR relates to technical progress. Google is committed to carbon neutrality via the use of data centres powered by renewable energy, while Microsoft employs AI to promote social and environmental sustainability on a global scale. To improve openness and accountability in the supply chain and guarantee ethical conduct, IBM employs blockchain technology. With its groundbreaking electric cars and battery breakthroughs, sustainable energy pioneer Tesla has transformed clean transportation and energy storage solutions. The results show that CSR powered by technology improves company image, encourages entrepreneurship, and creates new market opportunities. In addition to helping with global issues like climate change, digital inclusion, and ethical sourcing, businesses who use technology with an emphasis on corporate social responsibility (CSR) have an advantage in the marketplace. Nevertheless, in order to guarantee good CSR operations, issues including cybersecurity dangers, ethical problems with AI automation, and legal impediments need to be addressed.

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Keywords: CSR, 21st century, sustainability, social, technology, innovation.

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I. INTRODUCTION

Analysing the impact of various sustainable technologies on the CSR of contemporary organisations, the research sought to understand the role of technology in humanity's responsible growth. Reports in the media on "questionable technological development" and the "neglect of societal influences of technology" have a negative impact on public perception of how technological progress and new technologies contribute to society's sustainable development. Technological advancement has played a crucial role in driving human growth throughout history. And yet, historically, technical progress has been focused on achieving breakthroughs in technology and has been seen as an independent phenomenon from the ever-increasing social demands on society. [1]

The modern technical ideas of "Industry 4.0," "Industrial Internet scheme," and "Made in China 2025" have expanded our knowledge of the connections between technology and social difficulties in human progress. Recent decades have seen an uptick in studies highlighting technology's role in environmental preservation and societal economic output, but the field of technological development continues to operate independently of social science studies of development, with its primary emphasis on the attainment of technological goals. There has to be a shift and rebalancing of society's basic goals, which includes rethinking technological

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advancements for the needs of future society, because there is a mismatch between the direction of technological development and society's demands to solve pressing social issues.

Responsible development, sustainable development, and social responsibility are a few solutions that have emerged since the 1960s in response to the increasing impact that humans are having on the planet. [2]

These ideas are based on the "interest for the society stakeholders" responsibilities that scholars and professionals have in protecting the environment and improving collective welfare. The need for more responsible behaviour at all levels of human existence has influenced these development concepts, which centre on development as a whole: "intended for shaping humans' actions and policies orientated towards achieving responsible natural, social and economic goals of society" and "balancing social and technological development in achieving responsible advancement of modern society."

After the 1970s, when the concept of a responsible society gained traction, businesses began to focus more on their social responsibilities beyond maximising profits for shareholders. In response to these concerns, the idea of corporate social responsibility (CSR) emerged. CSR coordinates business objectives with societal development objectives and ensures that organisations properly care for their social, economic, and environmental impacts. Also, academics have up "directions for conceptual frameworks and methodologies for handling the management, organisational, and social issues in CSR practices." [3]

Because social scientists mostly spearheaded the CSR concept's development, other domains and facets of tackling sustainable development were under-discussed and included into the CSR model only inadvertently as exogenous variables or a model for thinking about CSR. Given this context, we must ask how nonsocial problems, such as the function and significance of technology in attaining CSR, may be adequately considered and integrated into efforts to solve society's long-term sustainability. Because researchers from many scientific fields still tend to tackle sustainable concerns in a monodisciplinary fashion, there has been little study on the connections between technology growth and sustainable development. [4].

Although there are a number of methodological and contextual suggestions from social scientists about the possible application of technical solutions to sustainable development, there has been very little research on the ways in which technology supports sustainability development in contemporary society or the societal impacts of new technologies. So, the literature detailed people's efforts to delve deeper into their previous ties, using frameworks like sociotechnical theory and other systems theories. New technological visions have increased the frequency with which the connections between technology and sustainability are discussed. Nevertheless, there has been little progress in comprehending this matter due to a lack of multidisciplinary research methods and distinct research interests between technological and social scholars. [5]

II. LITERATURE REVIEW

Freeman, (2024) [6] Looking back, we can see how CSR has progressed from altruistic efforts to a core component of business strategy. More proactive and purposeful corporate social responsibility (CSR) initiatives are becoming the norm, according to the literature.

Carroll, (2023) [7] Research into corporate social responsibility (CSR) has uncovered several facets, such as ethical company practices, community development, corporate governance, social responsibility, and environmental sustainability. A comprehensive comprehension of CSR procedures is enhanced by each of these dimensions.

Margolis and Walsh (2023) [8] Organisations participate in CSR for a variety of reasons, as shown in the literature. These include, but are not limited to, ethical concerns, legal compliance, stakeholder pressure, reputation management, and the quest of competitive advantage. these reasons differ depending on the industry and the location.

Bhattacharya, Sen, & Korschun, (2021) [9] The effect of corporate social responsibility (CSR) on consumers, workers, shareholders, and neighbourhoods has been the subject of empirical research. Although the exact form of the effect might differ, it is typical to hear that CSR initiatives have a positive correlation with stakeholder views, trust, and loyalty.

Objectives

- Investigate the ways in which renewable energy, artificial intelligence, blockchain, and the cloud are changing CSR strategies.
- Analyse how CSR-driven technology affects the long-term viability of a company, taking into account factors including profitability, regulatory compliance, and public perception.
- Consider digital inclusiveness, ethical supply chains, and ecological preservation when assessing the function of technology in advancing social development.

III. METHODOLOGY

In order to understand how top companies integrate CSR with technology developments, this study uses a case study methodology. Case studies of four large companies—Tesla, Google, IBM, and Microsoft—will be used to evaluate their CSR-driven technology projects.To get insight into CSR trends and technology applications, peruse industry papers, academic research, and company sustainability disclosures. Compare and contrast the ways in which technology is shaping CSR in various sectors, drawing attention to successful strategies and promising directions for the future. Using this framework, we can assess how CSR has changed in the digital era and how it has contributed to a more ethical and environmentally friendly corporate world.

IV. RESULTS

- *The Role of Technology in 21st-Century CSR (1200–1500 words)*

The whole course of societal evolution in the past was determined by technological progress and related technologies. So, technology has allowed and supported the development of various societies, beginning with the hunting society, when humans first emerged and lived in harmony with the natural world. Then came the agrarian society, beginning around 13,000 BC, marked by the invention of irrigation techniques and the spread of human settlements. Then came the industrial society, which began mass production with the steam locomotive, and the information society, which began with computers and the distribution of information, and finally arrived at today's super smart society.

In the past, people have put a premium on technology progress as a proxy for human growth. According to the literature, there are many fundamental causes for this growth. These include the population's unhappiness with their basic living necessities, the market's excess demand over offerings, limited capacity for knowledge advancement, and the endless supply of natural resources.

The literature highlights the significance of many current technical ideas, including Industry 4.0, the "Industrial Internet" program, "Made in China 2025," and Industry 5.0. They include the aims of society development into their broader perspective on technology, which is based on a number of technical alternatives, modifications, and solutions, both immediate and distant.

Technological progress in the twenty-first century has laid the groundwork for a super-smart society within the context of the fifth industrial revolution. This development allows for the storage of massive amounts of data in traditional databases and the provision of sophisticated instructions for processing this data. On the other hand, contemporary society has yet to find technological solutions that would enable a high level of convergence between cyberspace and physical space, complete connections between cyberspace and people, things, and systems, and the application of AI for thorough data treatment and suitable solutions for integrating AI with humans.

According to our findings, the main benefits of technological concepts of the 21st century lie in their multidisciplinary approach to studying technology and their emphasis on creating

technologies to address social problems, thus bridging the gap between the social studies of social development and the technological studies of technology. In today's world, there are numerous methodological, substantive, and adaptive limitations on the processes and mechanisms that could lead to more responsible technological development and advanced technologies. This is despite the fact that organisations and society as a whole are capable of achieving more socially orientated technological development.

The environmental component of corporate social responsibility (CSR) is heavily influenced by how organisations rank the ecological environment and how they evaluate the long-term viability of their operations and actions in relation to their ecological objectives. The growth of an understanding of the need of environmental protection among the organization's constituents is also crucial, as is their ethical resolve to behave responsibly both internally and externally and to conform to societal norms. This progress and the synchronisation of interests and goals—both immediate and distant, social and economic, partial and shared—are mostly the work of shareholders and management.

Furthermore, organisations' interests in environmental care may be significantly heightened by market circumstances in the 21st century. Due to the prevailing societal focus on protecting nature, there has been a growth in the market for products and services that aim to protect the environment. These include technologies that are clean or natural friendly, which reduce greenhouse gas emissions, promote responsible production, and help reduce food loss. Additionally, there is a need for goods that do not harm users, such as healthy and natural products. According to the research, organisations' sustainable economic approach might have a positive, negative, or neutral effect on their financial outcomes. Research on the impact of various economic policies on the organization's performance has, however, produced contradictory findings. The accomplishment of responsible economics in supporting the social and environmental objectives of organisations is further complicated by the fact that the literature does not detail the consequences of varying degrees of economic appropriateness on organisational outcomes. Questions of technical progress and organisational technology are indirectly and directly connected to analyses of the three pillars of CSR. As a result, research on the social side of corporate social responsibility focusses on topics like consumer choice and the application of technological orientations and technologies to the development of goods and services that lessen human impact on the environment, put a stop to harmful pollution, and safeguard future generations from the same.

Concerns about the potential of both older and more contemporary forms of technology to address pressing societal problems and mitigate their effects have recently dominated conversations about the social aspects of corporate social responsibility (CSR). On top of that, in the last few decades, economic treatment has centred on tech that can help responsibly balance the short-term gain for the most powerful people in society with the long-term social good for the majority of organisations and society as a whole.

- Case Studies on CSR and Technology

We look at four companies—Microsoft, Google, IBM, and Tesla—to see how CSR fits with technology in the modern day. We choose these firms because they are at the forefront of sustainability and innovation, and because they leverage technology in their corporate social responsibility initiatives. Different companies are making strides in different areas: Google is leading the way in renewable energy infrastructure, IBM is using blockchain to create more ethical supply chains, and Tesla is changing the game when it comes to clean mobility and energy storage. Sustainability, openness, and ethical corporate practices are guaranteed by these case studies that show how CSR activities are driven by technical breakthroughs.

Case Study 1: Microsoft – AI for Good & Sustainability Cloud

AI and cloud computing are at the heart of Microsoft's corporate social responsibility (CSR) agenda, which aims to improve the world. Climate change, healthcare, accessibility, and disaster response are some of the areas that Microsoft's AI for Good initiative is working to address. Deforestation and water scarcity are only two of the environmental problems that AI for Earth aims to address via funding research and technological solutions. In addition, with the support of real-time data analytics, Microsoft's Sustainability Cloud enables companies to monitor and lower their carbon emissions. Microsoft fosters innovation in ethical AI applications while enhancing sustainability efforts via the integration of AI with CSR.

Case Study 2: Google – Renewable Energy & Carbon Neutrality

Google has been at the forefront of environmentally conscious technology since 2017 when it pledged to use only renewable energy. Solar and wind power its data centres, which in turn power cloud services, YouTube, and search engines, greatly cutting down on carbon emissions. In order to make its data centres more efficient, Google's Carbon Intelligence Program uses AI to optimise energy use. In addition, in order to keep its carbon impact to zero, the corporation invests in carbon offset programs. By implementing these programs, Google demonstrates how major tech companies can combine corporate social responsibility (CSR) with their commercial strategies to support environmental sustainability.

Case Study 3: IBM – Blockchain for Supply Chain Transparency

Global supply networks are made more transparent and ethical by IBM's usage of blockchain technology. To minimise food waste and guarantee product authenticity, businesses may use IBM's Food Trust platform to trace food production from farm to table. Just as IBM's blockchain solutions in mining aid businesses in ensuring minerals are supplied responsibly, they also aid in the prevention of human rights breaches. By bringing together CSR and state-of-the-art tech, these projects will increase industry-wide accountability and traceability. In order to improve their corporate social responsibility, IBM is using blockchain technology to guarantee ethical business practices and fair trade.

Case Study 4: Tesla – Battery Innovations & Clean Energy Solutions

Electric vehicles (EVs) and battery storage systems are the centre of Tesla's corporate social responsibility (CSR) initiatives, which aim to transform sustainable energy. Reducing dependency on fossil fuels, the company's Gigafactories generate lithium-ion batteries that power EVs. Residential and commercial buildings alike may benefit from the effective storage of renewable energy thanks to Tesla's Powerwall and Megapack systems. Clean energy is being promoted globally by Tesla via the integration of sustainability and technology innovation. Tesla exemplifies CSR-driven entrepreneurship with its dedication to ethical sourcing and carbon footprint reduction.

Improved openness, effectiveness, and responsibility in CSR projects are all outcomes of technological advancements. Blockchain technology guarantees ethical supply chains by offering verifiable transaction records, and analytics driven by artificial intelligence enable businesses track their environmental effect. Industrial energy consumption may be optimised with the use of cloud computing and the Internet of Things (IoT), leading to less waste and more sustainability. Climate change, digital inclusion, and ethical sourcing are just a few global concerns that CSR-driven technology is working to address. Google has renewable energy programs, Microsoft has artificial intelligence for accessibility, and IBM has blockchain solutions. These innovations show how technology improves the efficacy of CSR, leading to lasting advantages for society and the environment.

Several obstacles stand in the way of tech-driven CSR, notwithstanding its advantages. Because of the need of safely storing and protecting sensitive information on social and environmental impacts, cybersecurity risks present challenges to CSR data management. Concerns around algorithmic

prejudice, privacy invasion, and job loss are just a few of the ethical issues brought up by AI and automation. To tackle these concerns, companies should establish data protection frameworks, responsible AI policies, and clear digital ethical rules. In the future, developments in green artificial intelligence, quantum computing, and the circular economy will bring CSR and innovation even closer together, guaranteeing that corporations will operate ethically and sustainably.

- Impact of CSR-Technology

Findings from earlier studies on how technology and technical progress have affected corporate social responsibility (CSR) in Indian businesses have been mixed. Although CSR is not explicitly addressed, the majority of empirical research do support the idea that contemporary technologies are crucial to the growth of organisations that meet societal demands. So far, only isolated studies have sought to deduce causal linkages between CSR and technology and to propose ways forward that would bring both into CSR development and employ technology in a more comprehensive manner.

Consequently, highlight the significance of CSR in this context and report on the most utilised management solutions for developing manufacturing organisations' preparedness for the implementation of Industry 4.0 as part of the study of 323 Indian industrial enterprises. The study compares and contrasts the ways in which companies in North America, Western Europe, Arab countries, and India achieve their corporate social responsibility (CSR) goals, and it explains the significance and function of various management solutions for responsible operation in sustainable supply chains.

Furthermore, using the results of the Society 5.0 development concept as a basis, provide ideas for bettering the methodological and contextual frameworks that address CSR in organisations more thoroughly. Research on CSR in Slovenia, as well as international studies on the topic, provide the theoretical and methodological foundations upon which we build our suggestions for CSR enhancement in line with guidelines for the creation of conceptual papers.

In order to better understand the connection between technology and the fundamental aspects of CSR, researchers in the last 10 years have often brought up the need for a more thorough investigation of technical concerns within CSR. Consequently, a great deal of research in the fields of management and the environment has raised the prospect of incorporating technical considerations into CSR treatments and, by extension, of expanding CSR models to include this aspect of CSR. Researchers disagree, however, on the areas that must be thoroughly examined in order to comprehend the technological component of CSR, the nature of the relationships between this component and the fundamental dimensions of CSR, and the breadth of substantive treatment that is necessary.

So far, studies have shown that in order to objectively evaluate sustainable technologies, we need to find ways to distinguish between two types of technology: (1) new technologies and (2) old technologies. This will include coming up with contextual and methodological answers. Hence, instead of including this problem into the CSR model itself, researchers describe it inside the CSR technology framework. The organisation isn't competent to define technical features at such a fundamental level, but it does so in its surroundings using well chosen social criteria. Therefore, any chosen technology that stands in for an appropriately sustainable technology for the organisation may be the topic of the technical component of CSR, independent of its real sustainability features.

V. DISCUSSION

When compared to other aspects of CSR in the modern day, the technology factor is clearly more important, according to the study findings. Accordingly, the majority of scholars believe that, in terms of CSR development, the technical component is just as important as other aspects grounded in an interdisciplinary and multifunctional comprehension of technological progress and technologies.

This study's results highlight the importance of technology in making CSR more data-driven, responsible, and effectively implemented. Corporate social responsibility (CSR) is now seen as both a moral imperative and a competitive advantage by IT giants like Google, Microsoft, IBM, and Tesla. [10] Transparency, efficiency, and sustainability have been greatly improved across sectors via the integration of renewable energy solutions, cloud computing, artificial intelligence, blockchain, and CSR activities. To illustrate the point, AI-driven sustainability monitoring aids businesses in gauging and lowering their carbon footprint, while blockchain technology enhances supply chain transparency, guaranteeing that raw materials are sourced ethically.[11]

Despite the fact that technology has bolstered CSR initiatives, it has also introduced new obstacles. When it comes to collecting and storing sensitive data on social and environmental impacts, cybersecurity is still an issue. Ethical concerns about inclusion and justice may also arise if AI-driven CSR projects unintentionally propagate prejudices.[12] When businesses make grand sustainability promises without really doing anything to back them up, this practice is known as "greenwashing," and it deceives both stakeholders and customers. Ethical artificial intelligence (AI), data governance (GD), and sustainable business models (SBMs) must undergo constant innovation to meet these problems. SBMs must also be held accountable by corporations. [13]

Going forward, smart technologies, monitoring systems powered by the Internet of Things (IoT), and decentralised data networks will be crucial in guaranteeing ethical corporate practices, according to the nexus of Industry 4.0 and CSR.[14] Corporate social responsibility (CSR) strategies that include circular economy models—i.e., product designs that prioritise reuse, recycling, and minimum waste—have the potential to significantly enhance the sustainability of company operations. Keeping CSR from becoming just a marketing tactic and instead seeing it as an essential component of business strategy is crucial for organisations in this age of rapidly changing technologies. [15]

VI. CONCLUSION

The groundbreaking impact of technology on 21st-century Corporate Social Responsibility (CSR) is emphasised by this study. Businesses may now achieve more transparency, efficiency, and sustainability via the combination of renewable energy, blockchain, cloud computing, and artificial intelligence, going beyond conventional CSR methods. Tech giants like Google, IBM, Tesla, and Microsoft are leading the way in tech-driven corporate social responsibility (CSR) initiatives that tackle pressing global issues like digital inclusion, climate change, and ethical supply chain management. Despite these advantages, technology-driven CSR is not without its problems. Some of these problems include cybersecurity threats, ethical quandaries with AI automation, and worries about corporate greenwashing. Staying true to CSR's original intent—rather than seeing it as a branding tactic—in the face of fast technological change calls for robust regulatory frameworks, corporate responsibility, and ethical innovation. Green artificial intelligence, circular economy models, and decentralised transparency solutions are some of the rising themes that will impact CSR in the future. To guarantee that corporate social responsibility (CSR) aids in the long-term viability of businesses and the improvement of society on a global scale, companies must ensure that technical progress is in line with social and environmental duties. Businesses may have a positive impact on society and the economy simultaneously by adopting responsible innovation practices and ethical leadership. This will help shape the contemporary world in a way that is both prosperous and sustainable.

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The Chinese Corporate Tax System: A Factor in Attracting and Maintaining Foreign Investments

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ABSTRACT

Aiming to reduce tax costs and social security contributions in the manufacture of products destined for other countries, China reorganised its legislation and improved its entire executive/ administrative foreign trade policy by accelerating the renovation and construction plan for approximately one thousand new ports/terminals along its extensive coastline. China has also modified its tax system by offering specific benefits to foreign enterprises (FEs) and foreign-invested enterprises (FIEs) operating in one of the five special economic zones (SEZs) or establishing themselves in areas of technological economic development (ETDZs). Even after its acceptance as the 143rd member country of the WTO, with numerous concessions, the Chinese corporate tax system remains a factor in attracting and retaining foreign investment.

Keywords: chinese corporate tax system. foreign investment. export of chinese products.

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Cláudio Tessari[α] & Camila Bandel N. Pinheiro[σ]

ABSTRACT

Aiming to reduce tax costs and social security contributions in the manufacture of products destined for other countries, China reorganised its legislation and improved its entire executive/ administrative foreign trade policy by accelerating the renovation and construction plan for approximately one thousand new ports/terminals along its extensive coastline. China has also modified its tax system by offering specific benefits to foreign enterprises (FEs) and foreign-invested enterprises (FIEs) operating in one of the five special economic zones (SEZs) or establishing themselves in areas of technological economic development (ETDZs). Even after its acceptance as the 143rd member country of the WTO, with numerous concessions, the Chinese corporate tax system remains a factor in attracting and retaining foreign investment.

Keywords: chinese corporate tax system. foreign investment. export of chinese products.

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I. INTRODUCTION

The intensification of trade between countries is a significant phenomenon in contemporary international relations, leading to conflicting patterns of state behaviour and the emergence of complex, often ambiguous institutions designed to regulate and promote the growth of global trade.[1]

This dynamic arises because, in many cases, trade succumbs to overwhelming global demands, which can deplete natural resources and contribute to an unequal distribution of wealth among nations.

Aiming to overcome the so-called “Asian crisis” by reducing social security contributions and tax costs in the manufacture of products for export, China reorganised its legislation, improved its entire executive/administrative foreign trade policy and changed its tax system, granting major benefits to foreign enterprises (FEs) and foreign-invested enterprises (FIEs), provided they are located in one of the five special economic zones (SEZs) or established in a financial and technological development zone (ETDZs) existing in that country. This article aims to analyse and demonstrate that measures such as the reform of China's corporate tax system remain key factors in attracting and retaining foreign investment, even

[1] TESSARI, Cláudio. A defesa nas medidas antidumping por meio do interesse público no Brasil, Canadá e na União Europeia. Porto Alegre: Livraria do Advogado Editora, 2016, p. 26.

after the country acceded to the World Trade Organisation as its 143rd member, which involved numerous concessions.

II. ANALYSIS OF THE CHINESE MARKET

Law is deeply influenced by economics, particularly due to its limitation to territorial jurisdiction. Wherever a group of people coexists, economic activity inevitably emerges, accompanied by the necessity for rules to regulate interactions. These norms are essential to ensure the social and economic harmony sought by all participants engaged in the market.

In a context marked by scarce resources and the continuous human drive for consumption, the boundary between Law and Economics becomes increasingly fluid. This interdisciplinary convergence is particularly evident in the pursuit of economic survival.[2]

In this sense, it is essential to note that any company or person that produces, sells, works, or buys is subject to the China Factor, which represents China's significant presence in the global economy.

This Factor is defined by China's increasingly profound influence on the prices and supply of products, services and wages, on the cost of raw materials, on the international division of labour, on the direction of investments, on competitiveness standards, on the global distribution of economic, political (geopolitical) and military forces, on the environment and so many other spheres of life, so that no one is free from its influence.[3]

Failing to take the China Factor into account because it does not represent an immediate threat is a strategic error, as companies and even entire production sectors emerge very quickly in that country, causing other companies that are not as well prepared and structured in the world to watch the Chinese take over their markets, with perplexity and a certain indignation. Therefore, the aforementioned China Factor must be considered at all times in the planning of companies and must be identified with precision as well as monitored.[4]

China systematises the administration of the executive branch as follows:

State Council, with a maximum of two consecutive terms of five years each;

a. President (Head of State): elected at each Congress of the Communist Party, every five years. Their role is to enact laws created by the National People's Congress (Legislative Branch), in addition to choosing all members of the legislative branch, creating decrees, declaring war, and declaring a state of emergency. Since the 1990s, the president has also been elected as the head of the Chinese Communist Party, and in this role, their main activity is to create general policies to be adopted by the government, in addition to overseeing foreign policy
b. Premier (Head of Government): elected by the president, they are responsible for implementing, in practice, the general policies established.
c. Popular (Central) Bank of China: controlled by the State Council, and responsible for monetary policy and the prevention and resolution of financial risk problems, safeguarding monetary stability in the country.

Regional Governments: appointed by the president, they are divided into:

- Twenty-two Provincial Governments (subdivided into municipalities).
- Four municipalities under the direct administration of the central government:

. Beijing;
. Shanghai;

[2] LONGO, André Koller Di Francesco. O planejamento tributário como alternativa para defesa concorrencial em operações de importação com o mercado Chinês. *In.*: Revista Tributária e de Finanças Públicas n. 110. Ano 21. São Paulo: Revista dos Tribunais, 2013, p. 369.

[3] QUARESMA, Henry Uliano. O Fator China. São Paulo: Aduaneiras, 2012, p. 10.

[4] QUARESMA, Henry Uliano. O Fator China. São Paulo: Aduaneiras, 2012, p. 10.

. Tianjin;
. Chongqing.

- Five Autonomous Regions

. Xinjiang (Uyghur ethnic group);
. Tibet;
. Inner Mongolia;
. Guangxi (Zhuang ethnic group);
Ningxia (Hui ethnic group).[5]

Intending to structure its economy, stimulate growth, and attract foreign investment, China established Special Economic Zones (SEZs) within its territory. These zones operate under distinct legal, customs, and tax regimes, offering advanced infrastructure, flexible regulations for foreign capital, and reduced import and export barriers. Since their inception in 1980, SEZs have embodied a more open market-oriented policy, strategically designed to attract investment and promote China's economic development on the global stage.

China has long challenged conventional political and economic logic, as it has been the dominant empire in Asia with a thousand-year history. Although it stagnated and was excluded from world trade for centuries, it decided to shift its approach in 1990, changing its internal and external policies and ending large-scale hunger. Since the 1982 Chinese Constitution:

The People's Republic of China is a socialist state under the people's democratic dictatorship led by the working class and based on the alliance of workers and peasants. China will remain in the initial stage of socialism for a long time. The fundamental task of the state is to concentrate efforts on modernising socialism toward building socialism with Chinese characteristics. Under the leadership of the Communist Party of China and guided by Marxism-Leninism, Maoism, and the theories of Deng Xiaoping, the Chinese of all ethnic groups will continue to adhere to the people's democratic dictatorship and the socialist path, support reform and opening up to the world, constantly improve socialist institutions, develop a socialist market economy, promote socialist democracy, improve the socialist legal system, and work hard and self-confidently to modernise industry, agriculture, science and technology, and national defence step by step, which will result in a strong, prosperous, and culturally advanced socialist democratic nation.[6]

Several Asian countries, such as Korea, Indonesia, and Malaysia, have deliberately depreciated their currencies since 1997 to maintain their export competitiveness. Thus, exporters start to receive more local money for the products they ship, consequently making imports more expensive. Such depreciation acts result in serious consequences for the country's entire economy, causing inflation, an increase in domestic debt tied to the dollar, lower wages, and a reduction in the value of the foreign currency of privatisable state-owned companies.[7]

Since 1998, some of the leading experts in international trade, including Brazilians, did not believe that China would be able to withstand the Asian crisis without devaluing its currency to sustain exports and maintain high economic growth. Despite significant internal and external challenges, the country overcame the situation and reinforced its role as a leader in global trade.

> The PBC eased the monetary policy, that is, expanded the money supply and loans and reduced the interest rate and other measures, such as labour policies, to stimulate domestic demand.
>
> [...] the government implemented and stimulated investment, both public and private, in innovation, economic restructuring, high-tech sectors, such as robotics and artificial intelligence, and environmental protection, and the monetary policy continued to be flexible.

The aim of replacing the Chinese economic model focused on the external sector for one domestic market was, first, to prevent the Chinese economy from slowing down too much and, second, to

[5] QUARESMA, Henry Uliano. O Fator China. São Paulo: Aduaneiras, 2012, p. 10.

[6] QUARESMA, Henry Uliano. O Fator China. São Paulo: Aduaneiras, 2012, p. 10.

[7] OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, p. 147.

ensure an annual average growth rate of 8.0% over the coming years.[8]

In other words, China, already on the right path to a market economy, instead of depreciating the Yuan (or renminbi, also known as the people's currency), preferred to adopt the classic means to stimulate its sales abroad, adopting the models already applied by the most significant exporting powers: the United States, Germany, Japan and the Netherlands.[9]

Aiming to compete with products from its Asian neighbours, now with lower prices, China improved its entire export system, starting with investments to promote production and, later, structuring sales in the foreign market, increasing profitability throughout production/sales, allowing exporting companies to maintain or adjust the prices of their products in the international market.[10]

These foreign investments began to benefit from broad tax exemptions, allowing the remittance of profits/dividends abroad in the first year of operation. Additionally, production financing volumes were increased, and interest rates were reduced to some of the lowest international levels (from Eximbank of the USA and Japan), Foreign companies were also authorised to participate in the insurance and exchange sectors, but under the close supervision of the Popular Bank of China (the country's Central Bank).[11]

To be able to send and receive great volumes of goods, China relies on a modern and efficient infrastructure with special emphasis on ports, as it has seven of the ten largest ports/maritime terminals in the world.[12]

Furthermore, China has also authorised the participation of foreign business groups in the construction and management of ports, using the Yangpu ports in the Hainan Island Economic Zone as a model, which received foreign investment of over US$2.5 billion. China currently has two of the ten largest ports on the planet, Shanghai (3rd) and the ultra-privatised Hong Kong, the latter being the world leader in container movement with 14 million units/year, which represents three times the total exports of the Port of Rotterdam and ten times that of all of Brazil.[13]

These advances demonstrate China's strategy of modernising its port infrastructure, adopting innovative technologies and sustainable solutions to strengthen its leadership position in global maritime trade.

As a result of these measures and provisions, after the first half of 1999, exports began to react, resuming and even surpassing the record levels from before the Asian crisis, with growth in July of that year of 7.5%; in August 17.8%; in September 20%; and in October 23.8%.[14]

In addition to receiving investments for the development of ports, China also invests in other countries when it is in its interest - for example, the port of Chancay in Peru ("investment of US$ 3.6 billion [R$ 18.4 billion]"[15]). The Chinese state-owned shipping company, Cosco Shipping

[8] TESSARI, Cláudio. FERRARI-FILHO, Fernando. Considerations about the Economic Growth of the Chinese Economy Since the 1990s. Available at: https://www.scirp.org/pdf/chnstd2025142_52550533.pdf. Accessed on 27th May 2025.

[9] *OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, p. 148.*

[10] OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, p. 148.

[11] TESSARI, Cláudio. FERRARI-FILHO, Fernando. Considerations about the Economic Growth of the Chinese Economy Since the 1990s. Available at: https://www.scirp.org/pdf/chnstd2025142_52550533.pdf. Accessed on 27th May 2025.

[12] China destaca-se com 7 dos 10 principais portos do mundo. *In.*: Camex do Brasil. Available at: https://comexdobrasil.com/china-tem-7-dos-10-principais-portos-do-mundo/. Accessed on 17th March 2025.

[13] OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, p. 148.

[14] OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, p. 148.

[15] BRAZIL. Ministry of Development, Industry, Commerce and Services.Notícia: Suframa e embaixada do Peru promovem evento sobre porto de Chancay para debater integração sul-americana. Available at: https://www.gov.br/suframa/pt-br/assuntos/noticias/suframa-e-embaixada-do-peru-promovem-evento-sobre-porto-de-chancay-para-debater-integracao-sul-americana. Accessed on 17th March 2025.

Company, which is leading the project, treats this mega port as a "world-class operator".[16]

The pillars for China's significant and continued economic expansion are (a) foreign investments, (b) the qualification of the workforce (quality, not cost, is crucial), (c) increasing productivity, and (d) improving competitiveness.

"After 15 years of extensive negotiations, on 11th December 2001, at the Doha Ministerial Conference, the members of the World Trade Organisation - WTO formally decided that China would become the 143rd member country of that Organisation."[17] Probably no other member agreed to make as many concessions as China to become part of this select group of countries that together form the WTO through an Accession Protocol.[18] In addition to not having been able to negotiate the rules to which it is now bound, it was subject to tremendous pressure for broad concessions during its accession process.[19] The highlights of the protocol mentioned above are:

Not to condition government advantage to attract investment, for example, technology transfer (which the other members can do);

In terms of *anti-dumping*, price comparisons to apply the measure when China is the subject of an investigation will not be made based on the Chinese market (as occurs, mutatis mutandis, with other members when they are investigated). It will be based on a third market, and this will be the case for a significant period of 15 years, starting in 2001. Special rules for price comparisons to apply a countervailing measure are also provided, and likewise, they will apply only to China for 15 years, starting in 2001;

- Allowing Argentina, the countries that form the European Community, Hungary, Mexico, and Slovakia to maintain prohibitions, quantitative restrictions, and other measures against Chinese imports that, strictly speaking, would be incompatible with WTO rules;
- Submit annually to a review mechanism for the implementation of the Accession Protocol, which has not been required of any other WTO member, through verifications carried out by the following subsidiary bodies of the WTO: *Council for Trade in Goods; Council for Trade-Related Aspects of Intellectual Property Rights; Council for Trade in Services; Committees on Balance-of-Payments Restrictions; Market Access (also covering ITA); Agriculture, Sanitary and Phytosanitary Measures; Technical Barriers to Trade; Subsidies and Countervailing Measures; Anti-Dumping Measures; Customs Valuation, Rules of Origin; Import Licensing; Trade-Related Investment Measures, Safeguards; Trade in Financial Services*, and this annual review process should last for eight years, starting in 2001.[20]

With "headquarters in Geneva, Switzerland, the WTO is an organisation composed of" 166 members (as of 30th August 2024), the "so-called Member Countries", and 23 "observer governments, keeping its doors open to all countries as long as the conditions of the accession process are respected".[21]

[16] PORTO DE CHANCAY: A ponte entre a América do Sul e a Ásia e a Oceania. Available at: https://www.gov.br/suframa/pt-br/publicacoes/2.SUFRAMAPortodoChancayCopiarCopiar.pdf. Accessed on 17th March 2025.

[17] TESSARI, Cláudio. A China na OMC, as medidas antidumping e o impacto do Brexit. Revista Portuária Economia e Negócios. Ano 15. edição 198. agosto 2016. p. 34. Available at: https://issuu.com/bteditora/docs/2016-08-15-revistaportuaria. Accessed on 16th December 2025.

[18] Full documentation on the outcome of the Chinese accession process (including schedules for goods and services) can be found in the World Trade Organization. Protocol on the Accession of China. Cambridge: Cambridge University Press, 2003 (vol. I, 1,061 pages).

[19] TESSARI, Cláudio. FERRARI-FILHO, Fernando. Considerations about the Economic Growth of the Chinese Economy Since the 1990s. Available at: https://www.scirp.org/pdf/chnstd2025142_52550533.pdf. Accessed on 27th May 2025.

[20] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 38-40.

[21] TESSARI, Cláudio. A defesa nas medidas antidimping por meio do interesse público no Brasil, Canadá e na União Europeia. Porto Alegre: Livraria do Advogado Editora, 2016, p. 31.

The annual review and analysis of Chinese trade policies and standards aims to identify possible violations of WTO rules by other members. Concerns about China's accession to the WTO are so significant that the United States, in addition to acting within the organisation itself to assess compliance with the obligations assumed, established a complementary unilateral mechanism. To this end, they set up, within the Trade Policy Staff Committee, the *Subcommittee* on China's WTO Compliance, dedicated to monitoring China's compliance with WTO standards. This Subcommittee was established in December 2001, coordinated by the *United States Trade Representative (USTR)*[22], which promotes meetings and publishes annual reports[23] to assess China's compliance with WTO rules.

In addition to this initiative, the US State Department created a task force to assess China's compliance with WTO rules through the UN *Implementation Coordination Committee*, based at the US Embassy in Beijing, the capital of China, whose duties are to investigate and analyse changes in Chinese rules that affect its commitments to the WTO.[24]

Nineteen years after joining the WTO, on 15th January 2020, the United States and China signed an economic and trade agreement known as the "Phase One Trade Deal".

This Agreement included commitments by China in the areas of intellectual property and technology transfer. It also guaranteed better market access for the agriculture and financial services sectors, along with China's commitment to increase its purchases of goods and services from the US.[25]

The growth of the Chinese economy is currently a matter that calls the entire international community's attention, as China's continued expansion over the past 30 years, at an average annual rate of 10%, has elevated the country to the status of the world's second-largest economy and global power.

A 2020 study by the Centre for Economics and Business Research (CEBR) projected that China would surpass the United States in economic size by 2027. However, the latest edition of the World Economic League Table (WELT 2025), published by international economic analysts at the CEBR, suggests that China's economic growth is expected to slow, and it will remain the world's second-largest economy over the next 15 years.[26]

The consequences of this position (felt worldwide) are enormous for the Brazilian economy since China has been Brazil's leading trading partner since 2009. It represents the most significant potential market for exports; the second-largest supplier and the primary source of new investment in the country.[27]

Regarding the 15-year trading partnership between China and Brazil, it is worth highlighting that "Bilateral trade reached US$157 billion in 2023, a historic record. Brazil is the country that receives the most Chinese investment in Latin America, with 48% of the total in the region."[28]

[22] "The Office of China, Mongolia and Taiwan Affairs is responsible for managing the formulation and implementation of U.S. trade policy for the People's Republic of China, Hong Kong, Macao, Mongolia and Taiwan, to increase access to US products and services in these markets and ensuring that the World Trade Organization (WTO) and bilateral commitments are enforced." (US, China, Mongolia and Taiwan. Available at: https://ustr.gov/countries-regions/china-mongolia-taiwan. Accessed on 17th March 2025.)

[23] USTR Releases Annual Report on China's WTO Compliance. Available at: https://ustr.gov/about- us/policy-offices/press-office/press-releases/2025/january/ustr-releases-annual-report-chinas-wto-compliance. Accessed on 17th March 2025.

[24] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 41.

[25] EUA. China, Mongolia and Taiwan. Available at: https://ustr.gov/countries-regions/china-mongolia-taiwan. Accessed on 17th March 2025

[26] World Economic League Table. Available at: https://cebr.com/world-economic-league-table/. Accessed on 17th March 2025.

[27] OLIVEIRA, Carlos Tavares de. China o Retorno à Liderança Mundial. São Paulo: Aduaneiras, 2012, prefácio.

[28] BRASIL. Ministry of Foreign Affairs. Nota à imprensa nº 237: VII Sessão Plenária da Comissão Sino-Brasileira de Alto Nível de Concertação e Cooperação (COSBAN). Available at: https://www.gov.br/mre/pt-br/canais_atendimento/imprensa/notas-a-imprensa/vii-sessao-plenaria-da-comissao-sino-brasileira-de-alto-nivel-de-concertacao-e-cooperacao-cosban. Accessed on 17 March 2025.

To this end, it is pertinent to prove this entire attraction factor by presenting China's socio-economic indicators for the year 2023:

In terms of GDP, China is the second-largest country in the world, having surpassed economic powers such as Spain, Canada, and Brazil (the 10th largest). To achieve this, "China used investment from foreign companies to develop its investment capacity".[29]

The primary bilateral mechanism governing relations between Brazil and China is the Sino-Brazilian High-Level Concentration and Cooperation Commission (COSBAN), which had its last meeting between June 4 and 7, 2024 ("the year that celebrates the 50th anniversary of the establishment of diplomatic relations between Brazil and China, as well as the 20th anniversary of the creation of COSBAN"[30]). It permitted the adoption of several initiatives handled by 11 thematic Subcommittees: "Politics; Economic-Trade and Cooperation; Economic-Financial; Industry, Information and Communication Technology; Agriculture; Sanitary and Phytosanitary Issues; Energy and Mining; Science, Technology and Innovation; Space Cooperation; Culture and Tourism; and Environment and Climate Change."[31]

China has become one of the actors with significant influence on the architecture of the international economic system, above all, through the consolidation of a robust institutional and financial structure, through which the country seeks to promote an alternative model of globalisation focused on cooperation and economic development without the imposition of political conditions and counterparts.[32]

China's reintegration into the global order was of critical significance, as a country with such extensive international economic interests could not remain excluded from the main multilateral economic organisation. Such exclusion prevented, on the one hand, the country from having its opinion considered in the formation of the international economic order and, on the other hand, left it in a vulnerable position in the field of global trade since it was constantly the victim of arbitrary and discriminatory treatment, without being able to use any means of defence.[33]

III. ANALYSIS OF THE CHINESE CORPORATE TAX SYSTEM AS A FACTOR IN ATTRACTING AND MAINTAINING FOREIGN INVESTMENTS

China's tax policy has played a key role in attracting foreign investment, leading to the creation of specific tax laws applicable exclusively to foreign invested (FIEs) and foreign enterprises (FEs). These companies benefit from reduced income tax rates and broader tax incentives compared to other Chinese companies.

[29] TESSARI, Cláudio. Interesse público é variável para se medir conveniência da medida antidumping [interview given to] jornalista Jomar Martins. Revista Eletrônica Consultor Jurídico – Conjur. 09 de out. 2016. Available at: https://www.conjur.com.br/2016-out-9/entrevista-claudio-tessari-professor-tributarista. ISSN 1809.2829. Accessed on 16th March 2025.

[30] BRASIL. Ministry of Foreign Affairs. Nota à imprensa nº 237: VII Sessão Plenária da Comissão Sino-Brasileira de Alto Nível de Concertação e Cooperação (COSBAN). Available at: https://www.gov.br/mre/pt-br/canais_atendimento/imprensa/notas-a-imprensa/vii-sessao-plenaria-da-comissao-sino-brasileira-de-alto-nivel-de-concertacao-e-cooperacao-cosban. Accessed on 17th March 2025.

[31] BRASIL. Ministry of Foreign Affairs. Nota à imprensa nº 237: VII Sessão Plenária da Comissão Sino-Brasileira de Alto Nível de Concertação e Cooperação (COSBAN). Available at: https://www.gov.br/mre/pt-br/canais_atendimento/imprensa/notas-a-imprensa/vii-sessao-plenaria-da-comissao-sino-brasileira-de-alto-nivel-de-concertacao-e-cooperacao-cosban. Accessed on 17th March 2025.

[32] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td_2778.pdf. Accessed on 26th May 2025.

[33] SHEN, Noronha Luo Pang. A China Pós-OMC. 2. ed. São Paulo: Observador Legal, 2004, p. 21.

China Socioeconomic Indicators	2023
Population (millions of inhabitants)	1.40967[34]
Growth rate in real terms (%)	80,5%[35]
Nominal GDP (US$)	1.294271,7[36]
Growth rate in nominal terms	92,3%[37]
Share of general government budget deficit (-) / surplus (+) in GDP (%)	-4,6[38]
Net exports of goods and services (100 million yuan)	27346,7[39]
Value of exports of commercial goods and services (millions of US$)	3.511.248[40]
Total exports	33790.4[41]
Value of imports of commercial goods and services (millions of US$)	3.125.185[42]
Total imports	25569,4[43]
Value of imports and exports of commercial goods and services (millions of US$)	6.636.433[44]
External debts (billions of US$)	3346,3[45]
Share of external debt in GDP	13,7%[46]
Exchange (R$/Rmb)	1,3219[47]

Regarding the specific legislation (income tax and tax incentives) applicable to FIEs and FEs, it is crucial to list the main Chinese corporate formats that allow the presence of a foreign partner or investor:

Foreign-investment enterprises (FIEs) refer to: Chinese-foreign equity joint ventures (EJV)[48]; Chinese-foreign contractual joint ventures (CJV)[49]; and wholly foreign-owned enterprises (WFOEs) of limited liability.

Foreign Enterprises (FEs) refer to those that: have an establishment or production site in China and carry out their business activities in China; or

b) Without having an establishment or production site in China, have income originating within the territory of China.[50]

[34] CHINA. National Bureau of Statistics of China. Available at:https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[35] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/english/tablequery. htm?code=AC03. Accessed on 17th March 2025.

[36] CHINA. National Bureau of Statistics of China. Available at:https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[37] CHINA. National Bureau of Statistics of China. Available at:https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[38] Snapshot BRICS Joint Statistical Publication 2024. Available at: https://brics.ibge.gov.br/downloads/Snapshot_BRICS_Joint_Statistical_Publication_2024.pdf. Accessed on 17th March 2025.

[39] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[40] Snapshot BRICS Joint Statistical Publication 2024. Available at: https://brics.ibge.gov.br/downloads/Snapshot_BRICS_Joint_Statistical_Publication_2024.pdf. Accessed on 17th March 2025.

[41] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[42] Snapshot BRICS Joint Statistical Publication 2024. Available at: https://brics.ibge.gov.br/downloads/Snapshot_BRICS_Joint_Statistical_Publication_2024.pdf. Accessed on 17th March 2025.

[43] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17 March 2025.

[44] Snapshot BRICS Joint Statistical Publication 2024. Available at: https://brics.ibge.gov.br/downloads/Snapshot_BRICS_Joint_Statistical_Publication_2024.pdf. Accessed on 17th March 2025.

[45] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[46] CHINA. National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/ english/tablequery.htm?code=AC03. Accessed on 17th March 2025.

[47] Conversor de moeda. Available at: https://www.bcb.gov.br/ conversao. Accessed on 17th March 2025.

[48] Sino-foreign equity consortia are limited liability companies owned by Chinese and foreign investors, in which the foreign partner's shareholding must be above 25% of the total share capital. This corporate form has a legal personality, as defined by Chinese law, and is the most widely used by foreign investors in China. (FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex, 2011, p. 168)

[49] Sino-foreign contractual consortia are companies governed by a contract between a foreign company and a Chinese company. In principle, this corporate form does not have a legal personality. The Sino-foreign contractual consortium differs from the Sino-foreign equity consortium in that it offers greater flexibility in both its constitution and in the distribution of profits to the contracting parties. (FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex, 2011, p. 168).

[50] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 167.

According to the Chinese Company Law[51], three types of companies are permitted in the country:

a) State-Owned Companies (SOEs); b) Limited Liability Companies; and c) Companies Limited by Shares.

The administration of revenues from taxes collected by these companies is divided between the local government (Local Tax Bureau) and the central government (Central Tax Bureau), with the latter being responsible for collecting corporate income tax, including both foreign-investment enterprises (FIEs) and foreign enterprises (FEs).[52]

> It is important to note that, unlike public spending, tax policy and administration in China are highly centralised - particularly since 2018, when local tax departments were placed under the authority of the State Tax Administration (STA). Local governments cannot create taxes, nor can they set the tax rates for the taxes under their jurisdiction. The maximum autonomy allowed is to choose the tax rate within a range established by national legislation.[53]

The taxes levied on activities carried out by FIEs and FEs in China are: a) corporate income tax; b) withholding tax; c) property tax; d) Value Added Tax (VAT); e) customs tax (import/export); f) plus customs fees. Each one is analysed below:

a) *Corporate income tax*: "This is one of the primary sources of tax revenue in China and is levied on profits earned by resident and non-resident companies operating in the country. Corporate income tax rates are currently set at 25% for resident companies and can range from 10% to 20% for non-resident companies[54]. The rate is 15% for high-tech companies or special development zones.

> The standard rate is 25%, but the rate can be reduced to 15% for qualified companies operating in sectors encouraged by the Chinese government (e.g., new/high-tech companies and certain integrated circuit manufacturing companies). Tax exemptions are also offered to companies operating in encouraged sectors. Other corporate income tax incentives are also available to companies that are tax residents in China.[55]

All companies operating in China, regardless of whether they provide products or services, are subject to income tax: a) a company considered a tax resident will be taxed at 25% on its global income; b) a non-tax resident company is also subject to the 25% rate, but only on income obtained in the country. In the case of income generated in China that does not require its physical presence in the country, a reduced rate of 20% applies.[56]

The Enterprise Income Tax has two regulatory frameworks: a) the Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign Enterprises[57], of 9th April 1991; and b) and the Rules for the Implementation of the Income Tax Law of the People's Republic of China for Enterprises with

[51] CHINA. Direito das Sociedades da República Popular da China. Available at: http://www.npc.gov.cn/npc/ c2/c30834 /202312/t20231229_433999.html. Accessed on 17th March 2025.

[52] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 165.

[53] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td _2778.pdf. Accessed on 26th May 2025.

[54] CAMERLYNCK, Ruben. Tributação na China: Navegando pelo Intricado Sistema Fiscal. Available at: https://brasiltax.com/blog/tributacao-na-china/. Accessed on 24th May 2025.

[55] Overview of PRC Taxation System. Available at: https://www.pwccn.com/en/services/tax/accounting-and-payroll/overview-of-prc-taxation-system.html. Accessed 24th May 2025.

[56] BRASIL. Ministry of Foreign Affairs. Como exportar China (February 2018). Available at: https://www.gov.br/empresas-e-negocios/pt-br/invest-export-brasil/exportar/conheca-os-mercados/como_exportar_privado/como-exportar.pdf/BaseguiaCOMOEXPORTARCHINA.pdf. Accessed on 19th March 2025.

[57] Available at: https://www.wto.org/english/thewto_e/acc_e/chn_e/wtaccchn46_leg_5.pdf. Accessed on 19th March 2025.

Foreign Investment and Foreign Enterprises,[58] dated 1st July 1991.

The Chinese income tax calculation system can be implemented in two ways, namely: a) Actual Basis, similar to the Brazilian real profit system, according to the following formula: Taxable Income = [(Total Revenue) – (Costs + Expenses + Losses)]; b) Deemed Profit Basis, similar to the Brazilian presumed profit system, which is allowed in minimal cases, depending on the legal entity's line of business.[59]

b) *Withholding tax*: foreign companies not operating in China are "subject to a 10% withholding tax on income from capital gains, dividends, interest, property rental, royalties and other income".[60]

c) *Property tax*: consists of six taxes: *i)* real estate transfer tax; *ii)* real estate property tax; *iii)* stamp duty on deeds; *iv)* land appreciation tax; *v)* urban land use tax; and *vi)* rural land use tax.[61]

d) *Value Added Tax (VAT):* It is the leading indirect tax in China, with the highest revenue. VAT is an indirect tax levied on goods sold, services provided, or products and services imported into China (exports are not considered because the rate is zero).[62] "VAT is charged at different rates, depending on the nature of the product or service, with rates ranging from 3% to 17%".[63]

e) *Customs tax*: tax levied on imported and exported goods from China, with three variable rates: ad valorem, fixed per unit, or a combination of both. The rates on exported Brazilian products can vary from zero (for example: cellulose) to 32.5% (for example: sugar cane).[64]

f) *Customs fees*: "a type of tax charged by the customs authorities of a country on the import and export of goods that pass through its customs, following the respective laws in force".[65]

In addition, the Enterprise Income Tax Law of the People's Republic of China divides enterprises into resident enterprises and non-resident enterprises: a) resident enterprises are enterprises that are established in China following the law, or are established under the law of a foreign country (region) but are effectively managed by institutions in China; b) non-resident enterprises are enterprises that are established following the law of a foreign country (region) and whose actual administrative institution is not in China but have institutions or companies in China, or do not have such institutions or companies but have income generated within China.[66]

A resident enterprise shall pay enterprise tax on its income generated both inside and outside China, and a non-resident enterprise that has established institutions or companies in China shall pay tax on the income earned by its institutions or companies within China and on the

[58] Available at: https://www.wto.org/english/thewto_e/acc_e/chn_e/wtaccchn46_leg_4.pdf. Accessed on 19th March 2025.

[59] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 171.

[60] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td_2778.pdf. Accessed on 26th May 2025.

[61] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td_2778.pdf. Accessed on 26th May 2025.

[62] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td_2778.pdf. Accessed on 26th May 2025.

[63] CAMERLYNCK, Ruben. Tributação na China: Navegando pelo Intricado Sistema Fiscal. Available at: https://brasiltax.com/blog/tributacao-na-china/. Accessed on 24th May 2025.

[64] CARVALHO JUNIOR, Pedro Humberto Bruno de; NUNES, Ticiana Gabrielle Amaral. O sistema tributário da china: um olhar a partir do Brasil. Available at: https://repositorio.ipea.gov.br/bitstream/11058/11235/1/td_2778.pdf. Accessed on 26th May 2025.

[65] Tipos de imposto em vigor no Interior da China. Available at:https://investhere.ipim.gov.mo/pt-pt/gba/investment/taxation/mainlandcurrenttaxes/. Accessed on 24th May 2025.

[66] CHINA. Law of the People's Republic of China on Enterprise Income Tax. Available at: http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471133.htm. Accessed on 19th March 2025.

revenue generated outside China which is relevant to such institutions or companies established in China.[67]

A non-resident enterprise that has not established a company or a branch in China, or has established one but the income obtained is irrelevant to it, is subject to taxation on revenue sourced within China.[68]

It is essential to note that the Chinese government allows foreign companies to remit profits, dividends, and bonuses to other countries. However, they must comply with tax, regulatory, and exchange control rules to make these transfers, i.e., international transfers are subject to regulations by the Popular Bank of China (PBC) and the State Administration of Foreign Exchange (SAFE).

These amounts to be transferred must be converted from yuan (RMB) to foreign currency before being remitted, which must be done by authorised banks and regulated by the SAFE. Furthermore, the remittances of these amounts cannot exceed the company's audited net profit, as there are restrictions in place to prevent tax evasion and excessive capital outflows. The Chinese government uses tax incentives to promote the reinvestment of profits. On the other hand, the government can also impose temporary controls to prevent capital flight, especially in periods of economic volatility.

The following income of an FIE or FE is subject to taxation in China: a) income derived from the activities of FIEs and FEs with a company or branch in China; b) interest; c) rent; d) royalties; e) other income originating inside and outside China related to FIEs and companies or branches of FEs, being that the income of an FIE that has its head office in China is taxed on a worldwide basis, that is, income originating inside and outside China, as determined by Article 3 of the Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign-Owned Enterprises of April 9, 1991:

> Article 3. Any enterprise with foreign investment that establishes its head office in China shall pay income tax on both its domestic and overseas income. In contrast, a foreign enterprise must pay income tax only on its income sourced within China.[69]

On the other hand, the following income obtained through FEs that do not have an establishment or branch in the country are subject to taxation in China: a) profits/dividends from companies in China (excluding FIEs); b) interest on deposits or bank loans originating in China; c) income from renting property to tenants located in China; d) royalties from trademarks, copyrights, patents used in China; e) gains obtained from the sale of real estate located in China; and other income originated in China and specified by the Ministry of Finance.

Accumulated tax losses may be offset in subsequent fiscal years (precluded from past ones) for a maximum period of five years, and linear depreciation of goods, equipment, and fixed assets is permitted, for which authorisation from the Tax Administration must be obtained.

It is worth noting that in China, there is the possibility of granting an exemption from the income tax rate (Tax Holiday). The period and rate vary according to the type of company, sector, location, and the incentive granted. In summary: a) high-tech companies: reduction to 15% for 3 years, renewable; b) companies in SEZs and strategic sectors: exemptions and reductions for 3 to 5 years; c) small companies and startups: reduced rates for an indefinite period; d) foreign companies that reinvest in China: exemption from tax on dividends.

[67] CHINA. Law of the People's Republic of China on Enterprise Income Tax. Available at: http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471133.htm. Accessed on 19th March 2025.

[68] CHINA. Law of the People's Republic of China on Enterprise Income Tax. Available at: http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471133.htm. Accessed on 19th March 2025.

[69] CHINA. Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign Enterprises. Available at: https://www.wto.org/english/thewto_e/acc_e/chn_e/wtaccchn46_leg_5.pdf. Accessed 17th March 2025.

FIEs can also set up their headquarters in Economic and Technical Development Zones (ETDZs), "usually located on the outskirts of urban areas" and which "were created in many cities open to foreign investment and, in 2010, reached a total of 69. ETDZs are hotspots for foreign investment because they provide access to China's local markets".[70]

Furthermore, among many other zones, there are private zones, where some foreign companies negotiate the use of a stretch of land for development, which have multiplied in recent years. They are usually subject to local authorities and are often created as sub-zones of ETDZs.[71]

China has a vast network of Double Taxation Agreements with several countries, including Brazil. By 31st December 2024, China had closed tax treaties/agreements with 114 countries/ regions. China signed tax information exchange agreements with Argentina, the Bahamas, Bermuda, the British Virgin Islands, the Cayman Islands, Guernsey, the Isle of Man, Jersey, Liechtenstein, and San Marino on 31st December 2024. On the same date, China had totalisation agreements in force with 11 countries, including Canada, Denmark, Finland, Germany, Japan, the Republic of Korea, Luxembourg, the Netherlands, Serbia, Spain, and Switzerland. China has also signed a totalisation agreement with France, which has not come into effect.[72]

Despite the double taxation agreements, China's national general government budget revenue in 2024 reached 21,970.2 billion yuan, representing a 1.3% increase compared to the previous year. Of this total, national tax revenue amounted to 1,749.72 billion yuan, a 3.4% year-on-year decline. Breaking down these figures, the following can be mentioned as examples: a) domestic value-added tax was 666.72 billion yuan, a decrease of 3.8% year-on-year; b) corporate income tax was 4,088.7 billion yuan, a decrease of 0.5% year-on-year; c) personal income tax was 1,452.2 billion yuan, a decrease of 1.7% year-on-year; d) value-added tax and consumption tax on imported goods amounted to 1.917.7 billion yuan, down 1.6% year-on-year. Tariffs totalled 244.3 billion yuan, down 5.7% year-on-year; e) export tax rebates totalled 1.928.1 billion yuan, up 12.6% year-on-year.[73]

Regarding the percentages applicable to the calculation base:

a) Corporate income tax (CIT) varies from 10 to 25% depending on the activity carried out;[74]

b) Withholding tax on dividend remittances is generally 10%[75], and may be reduced by double taxation agreements between China and other countries;

c) Corporate capital gains tax is subject to the normal corporate tax rate, and the individual capital gains tax rate is 20%;

d) Value Added Tax – VAT has rates ranging from zero to 13%: *i)* taxpayers of limited liability companies are subject to three rate levels: 5%, 3% and 1% (due to the impact of the pandemic, temporary reduction measures are in effect); *ii)* ordinary taxpayers are subject to four rate levels:

[70] BRASIL. Ministry of Foreign Affairs. Como exportar China (February 2018). Available at: https://www.gov.br/empresas-e-negocios/pt-br/invest-export-brasil/exportar/conheca-os-mercados/como_exportar_privado/como-exportar.pdf/BaseguiaCOMOEXPORTARCHINA.pdf. Accessed on 19th March 2025.

[71] BRASIL. Ministry of Foreign Affairs. Como exportar China (February 2018). Available at: https://www.gov.br/empresas-e-negocios/pt-br/invest-export-brasil/exportar/conheca-os-mercados/como_exportar_privado/como-exportar.pdf/BaseguiaCOMOEXPORTARCHINA.pdf. Accessed on 19th March 2025

[72] Foreign tax relief and tax treaties. Available at: https://taxsummaries.pwc.com/peoples-republic-of-china/individual/foreign-tax-relief-and-tax-treaties. Accessed on 18th March 2025.

[73] CHINA. Ministry of Finance of The People's Republic of China. Receita e despesa fiscal em 2024. Available at: https://gks.mof.gov.cn/tongjishuju/202501/t20250124_3955083.htm. Accessed on 19th March 2025.

[74] CHINA. Commerce and Investment Promotion Institute. Available at: https://investhere.ipim.gov.mo/pt-pt/gba/investment/taxation/mainlandcurrenttaxes/.

[75] Tax Summaries. Available at: https://taxsummaries.pwc.com/peoples-republic-of-china. Accessed on 18th March 2025.

13%, 9%, 6% and 0%[76]. The zero rate applies to "exports of goods; exports of repair, replacement and processing services; international transpo- rtation services and spacecraft transpor- tation services; exported services that are entirely consumed outside China," and may vary up to 13%.[77] "Foreign companies investing in the country are exempt from paying VAT when they transfer equipment goods from their headquarters in other countries to their headquarters in China. For companies exporting to the country, VAT will be collected by customs within a period that may vary between one day and three months, depending on the local tax authority at the point of entry";[78]

e) Business Activities Tax, which is levied on transactions involving the provision of services and the sale of intangible goods, the rate of which varies from 1% to 56% and may also be set per yuan (RMB)[79];

f) Consumption Tax, which is levied at a rate of 1% to 56% on the value of the luxury or superfluous merchandise or goods;

g) Land Value Appreciation Tax (LVAT) also has a progressive rate, ranging from 30% to 60%, applied to the appreciation of real estate at the time of transfer or sale (profit over original cost);

h) Customs Duty is a type of tax charged by a country's customs authorities on the import and export of goods that pass through its customs, according to the respective laws in force.[80]

It is also crucial to address the issue of Transfer Pricing, which refers to the identification of discrepancies between the price established in a commercial transaction between companies in the same group and the fair, normal, or market price that would be applied between independent companies. This concept is especially relevant for transactions between multinationals covering the transfer of tangible and intangible assets, intellectual property, services, loans, leasing, and other internal transactions.

Regarding Transfer Pricing, China accepts the Advance Pricing Agreements (APA) established between the parties and allows these agreements to be: a) unilateral, agreement between the company and the Chinese tax authority; b) bilateral, involving the tax authority of China and another country with a double taxation treaty; and c) multilateral, involving China and multiple tax jurisdictions.

In the context of corporate reorganisations, Chinese law provides for two forms of incorporations: a) Absorption Mergers: occurs when a company acquires another or a group of companies, maintaining its existence while the incorporated company(ies) is/are dissolved after the completion of the process; b) New Establishment Mergers: refers to the merger of two or more companies to form a new entity, resulting in the extinction of the original companies after the completion of the incorporation.

Regarding the division of companies with foreign investment, Chinese legislation establishes that the split may occur through: a) Continuation Division, characterized by the operation in which a company is divided into two or more companies, through the continuation of the original company, and with the creation of one or more companies; b) Dissolution Division: occurs when a company is divided into two or more companies.

It is also worth mentioning that tax incentives originally granted to a company may be inherited by incorporation or division successors. According to the Chinese Incorporation and Division Tax Rules, asset, liability, and equity accounts must be

[76] CHINA. Commerce and Investment Promotion Institute. Available at: https://investhere.ipim.gov.mo/pt-pt/gba/investment/taxation/mainlandcurrenttaxes/.
[77] Tax Summaries. Available at: https://taxsummaries.pwc.com/peoples-republic-of-china. Accessed on 18th March 2025.
[78] BRASIL. Ministry of Foreign Affairs. Como exportar China (February 2018). Available at: https://www.gov.br/empresas-e-negocios/pt-br/invest-export-brasil/exportar/conheca-os-mercados/como_exportar_privado/como-exportar.pdf/BaseguiaCOMOEXPORTARCHINA.pdf. Accessed on 19th March 2025.
[79] CHINA. Commerce and Investment Promotion Institute. Available at: https://investhere.ipim.gov.mo/pt-pt/gba/investment/taxation/mainlandcurrenttaxes/.
[80] CHINA. Commerce and Investment Promotion Institute. Available at: https://investhere.ipim.gov.mo/pt-pt/gba/investment/taxation/mainlandcurrenttaxes/.

maintained at historical cost in both financial and tax accounting before the restructuring.[81]

Tax losses accumulated by a company in the years following incorporation or division may be transferred to the new companies to reduce the tax burden. However, this transfer is not automatic and must comply with requirements such as a) the reorganisation must have a legitimate economic purpose and cannot be done solely to avoid taxes; b) the new resulting company must maintain the continuity of the business and operational structure; c) the transferred losses must be within the permitted offset period (generally 5 years in China).

With the enforcement of the Unified Corporate Income Tax Law in 2008, Chinese and foreign companies began to be taxed equally, with the standard Corporate Income Tax (CIT) rate of 25%. It happened after its acceptance by the WTO, to dispel the hypothesis that Chinese domestic companies occupy "an unequal competitive position and will affect the establishment of a unified, standardised and fair market competition environment".[82]

IV. CONCLUSIONS

Trade exchanges between nations represent a phenomenon of modern international relations that decisively influences the behaviour of countries. Any company or individual that produces, sells, works or buys is subject to the China Factor, which refers to China's growing influence on global prices and product supply, driven by the country's rapid ability to develop companies and entire industrial sectors.

In full expansion, China remains the global second-largest economy, and, after becoming the 143rd member country of the WTO, it began to be recognised worldwide as a market economy.

Nevertheless, despite the annual review of Chinese trade policies and regulations, which aimed at identifying possible violations of WTO rules, the Chinese corporate tax system continues to be a factor in attracting and maintaining foreign investment.

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2. BRAZIL. Ministry of Foreign Affairs. Nota à imprensa nº 237: VII Sessão Plenária da Comissão Sino-Brasileira de Alto Nível de Concertação e Cooperação (COSBAN). Availableathttps://www.gov.br/mre/pt-br/canais_atendimento/imprensa/notas-a-imprensa/vii-sessao-plenaria-da-comissao-sino-brasileira-de-alto-nivel-de-concertacao-e-cooperacao-cosban. Accessed on 17th March 2025.
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[81] FURLAN, Fernando de Magalhães; FELSBERG, Thomas Benes. Brasil China Comércio, Direito e Economia. São Paulo: Lex Editora, 2005, p. 186.

[82] CHINA. Explicação sobre o Projeto de Lei do Imposto de Renda Empresarial da República Popular da China. Available at: https://www.gov.cn/2007lh/content_545816.htm. Accessed on 19th March 2025.

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Supply Chain Integration and Employee Productivity in Maritime Firms in Nigeria

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ABSTRACT

This study investigated the effect of Supply Chain Integration (SCI) on Employee Productivity (EP) in maritime firms in Delta State, Nigeria. The study focused on three dimensions of SCI: Supply Chain Integration Index (SCII), Internal Integration (II), and External Integration (EI), examining how each relates to employee productivity outcomes in a developing regional context. The study was anchored on the Productivity Theory. A descriptive survey research design was adopted. The population of the study comprised 9,540 employees from selected maritime firms, with a sample size of 370 determined using Morgan's table. Out of the 370 questionnaires distributed, 293 were validly returned, representing a response rate of 79.19%. The research instrument was a structured questionnaire validated by experts and tested for reliability, yielding a Cronbach's alpha coefficient of 0.79. Data collected were analyzed using descriptive statistics, Pearson correlation, and multiple regression techniques. Findings revealed that SCII and II have significant positive effects on employee productivity, while EI showed a negative but significant effect. Specifically, the regression analysis showed that II had the strongest positive influence on EP ($\beta = 0.749$, $p < 0.01$), followed by SCII ($\beta = 0.227$, $p < 0.01$), while EI had a negative coefficient ($\beta = -0.183$, $p < 0.05$), suggesting possible inefficiencies or trust deficits in external collaboration. It recommends targeted investment in internal systems, enhanced collaboration across departments, and more strategic external partnerships. The findings provide practical insights for policymakers and organizational leaders seeking to optimize employee output through integrated supply chain strategies in similar developing economies.

Keywords: supply chain integration, employee productivity, internal integration, external integration, maritime firms.

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I. INTRODUCTION

In the globalized business environment, supply chain integration (SCI) has emerged as a vital strategic tool for enhancing organizational performance and competitiveness. Supply chain integration involves the alignment and seamless coordination of internal processes and external partnerships to achieve greater efficiency, responsiveness, and customer satisfaction. The concept is particularly crucial in dynamic industries such as maritime logistics, where timely and synchronized operations directly impact productivity (Chowdhury et al., 2023). The maritime industry, being the backbone of international trade, requires efficient integration of processes, systems, and actors within and beyond the organization to ensure timely delivery, cost-effectiveness, and adaptability to market demands.

Internal integration refers to the coordination of processes, departments, and information within an organization to improve workflow and reduce redundancies. In maritime firms, internal integration includes aligning departments such as procurement, operations, warehousing, and human resources to streamline decision-making and resource utilization (Wong et al., 2022). By enhancing communication and collaboration across departments, maritime firms can respond more efficiently to operational challenges, reduce delays, and enhance employee productivity. When internal integration is poor, it often leads to

miscommunication, bottlenecks, and inefficiencies that negatively affect employees' ability to meet performance targets.

External integration, on the other hand, emphasizes collaboration and real-time information sharing with external stakeholders such as port authorities, logistics providers, shipping companies, and customers. In maritime operations, where delays and miscommunication with external partners can cause costly disruptions, external integration becomes crucial (Srinivasan & Simatupang, 2023). It fosters mutual understanding, shared objectives, and coordinated activities that can ease the burden on employees and improve task execution. As maritime firms in Nigeria continue to face infrastructural, regulatory, and operational challenges, improving external integration can mitigate many of these issues and create a more productive work environment for employees.

The Nigerian maritime sector has the potential to significantly contribute to economic development, given its strategic coastal location and access to international markets. However, productivity challenges—often linked to poor supply chain coordination—have limited its impact. Maritime firms in Nigeria struggle with issues such as inefficient port operations, lack of real-time data exchange, poor infrastructure, and fragmented logistics networks (Nwachukwu et al., 2021). These challenges can reduce employee morale and performance, especially when they are not supported by integrated systems that enable effective job execution. Hence, aligning internal and external processes through effective supply chain integration is essential to unlocking employee potential and overall organizational productivity.

Employee productivity in maritime firms is influenced not only by individual capacity or training but also by the structural and operational environment. Employees are more productive when they work in systems that support seamless workflow, reduce redundancies, and eliminate unnecessary delays (Agbo et al., 2022). Supply chain integration, by improving internal coordination and building strategic external relationships, creates such an environment. Consequently, understanding the specific role of SCI dimensions in shaping employee productivity within Nigeria's maritime sector is timely and necessary.

Despite the growing interest in supply chain practices globally, there is a paucity of research that focuses on how SCI affects employee productivity, especially within the context of maritime firms in developing countries like Nigeria. Existing studies often emphasize cost reduction and customer satisfaction, while overlooking internal performance metrics such as employee output, job satisfaction, and task efficiency (Okonkwo & Adebayo, 2023). This study seeks to fill this gap by examining how internal and external integration under the umbrella of the supply chain integration index influence employee productivity in Nigeria's maritime sector. The findings will be vital for managers, policymakers, and stakeholders aiming to optimize operations and enhance workforce performance through strategic supply chain practices.

Statement of the Problem

Despite the growing recognition of supply chain integration (SCI) as a strategic tool for enhancing organizational efficiency, many maritime firms in Nigeria continue to experience low employee productivity due to fragmented internal operations and weak external collaborations. Ineffective communication between departments, poor coordination with key external stakeholders such as port authorities and logistics service providers, and the absence of real-time data exchange systems have created operational bottlenecks that hinder employees' ability to perform optimally. While previous studies have focused on the impact of supply chain practices on cost reduction and customer satisfaction, limited attention has been given to how SCI—particularly its internal and external dimensions—affects employee productivity in the unique operational context of Nigeria's maritime industry (Okonkwo & Adebayo, 2023; Nwachukwu, Ogbonna & Ugochukwu, 2021). This gap underscores the need for empirical investigation into how supply chain integration practices influence employee output,

job satisfaction, and overall performance, thereby providing actionable insights for improving workforce productivity in the sector.

II. RESEARCH QUESTIONS

The following research questions were raised for the study:

1. How does the Supply Chain Integration Index affect employee productivity in maritime firms in Nigeria?
2. What is the influence of internal integration on employee productivity in maritime firms in Nigeria?
3. How does external integration impact employee productivity in maritime firms in Nigeria?

Objective of the Study

The primary objective of this study is to examine the relationship between supply chain integration and employee productivity in maritime firms in Nigeria. while the **s**pecific objectives are to:

i. Examine the effect of the Supply Chain Integration Index on employee productivity in maritime firms in Nigeria.
ii. assess the influence of internal integration on Employee productivity in maritime firms in Nigeria.
iii. Evaluate the impact of external integration on employee productivity in maritime firms in Nigeria.

Research Hypotheses

Based on the objectives of this study, the following null hypotheses are formulated to guide the investigation:

H_{01}*:* There is no significant relationship between the Supply Chain Integration Index and employee productivity in maritime firms in Nigeria.

H_{02}*:* Internal integration has no significant effect on employee productivity in maritime firms in Nigeria.

H_{03}*:* External integration does not significantly influence employee productivity in maritime firms in Nigeria.

Justification of the study

The justification for this study lies in the strategic importance of the maritime sector to Nigeria's economic development and the critical role employee productivity plays in driving operational efficiency within this industry. As global trade intensifies and competitive pressures mount, maritime firms must optimize both their internal processes and external partnerships to remain efficient and productive. However, in Nigeria, many maritime organizations continue to face challenges related to fragmented supply chain systems, poor integration of information and logistics, and limited collaboration across operational units—all of which hinder employee performance. Existing literature has largely focused on broader supply chain outcomes such as cost reduction and customer satisfaction, with limited attention to how supply chain integration, specifically internal and external integration, directly affects employee productivity in the Nigerian maritime context. By examining this relationship, the study aims to fill a significant empirical gap, offering actionable insights for managers, policymakers, and stakeholders in the maritime industry. The findings will support evidence-based decision-making and foster the development of integrated strategies that align operational frameworks with workforce capabilities, ultimately contributing to enhanced organizational performance and national economic growth.

Scope of the Study

i. *Geographical Scope:* This study is limited to maritime firms operating within Nigeria, with a focus on key port cities such as Lagos, Port Harcourt, and Calabar where maritime activities are most concentrated.
ii. *Subject Scope:* The research concentrates specifically on the relationship between supply chain integration (using Supply Chain Integration Index, Internal Integration, and External Integration) and employee productivity within the selected maritime firms.
iii. *Respondent Scope:* The study targets employees and supply chain management personnel in maritime firms, including

operational managers, logistics officers, and administrative staff who are directly involved in or affected by supply chain processes.

iv. *Content Scope:* The content of the study covers how the integration of supply chain functions internally (within the firm) and externally (with suppliers and partners) influences employee output, work efficiency, and overall productivity levels in the maritime sector.

III. REVIEW OF RELATED LITERATURE

3.1 Conceptual Review

It is imminent to explores key concepts that form the foundation of the study, beginning with the Supply Chain Integration Index as a critical measure of supply chain cohesion and its influence on employee productivity.

3.2 Supply Chain Integration Index

The Supply Chain Integration Index is a comprehensive metric that evaluates the extent to which an organization's supply chain processes—spanning procurement, production, logistics, and information sharing—are aligned and harmonized both internally and externally. It reflects the organization's capability to coordinate operations across departments and with external stakeholders to improve responsiveness, reduce delays, and enhance overall efficiency. Effective supply chain integration enables firms to respond proactively to market dynamics, which is essential for maintaining employee productivity and service quality in high-demand sectors like maritime logistics. Scholars have emphasized that a high level of supply chain integration not only streamlines workflows but also improves transparency, information flow, and resource allocation—all of which significantly affect employee output and satisfaction (Chen et al., 2020; Manfreda et al., 2021). The index serves as a benchmark to assess integration maturity levels across firms and can highlight gaps in collaboration and communication that may hinder employee performance (Wong et al., 2022). Research by Zhou and Benton (2023) further suggests that firms with higher SCI index scores experience better alignment between strategic goals and employee tasks. In the maritime context, where timing, coordination, and precision are vital, the SCI Index becomes an essential tool for evaluating operational excellence and labor efficiency (Adeoye & Omotayo, 2021; Alomari et al., 2022). Therefore, integrating the SCI Index into organizational performance analysis helps maritime firms in Nigeria identify bottlenecks and adopt data-driven approaches to workforce optimization.

3.3 Internal Integration

Internal integration refers to the alignment and coordination of various functional areas within an organization—such as procurement, production, inventory management, human resources, and information systems—to ensure seamless operations and unified decision-making. It focuses on breaking down departmental silos to encourage collaboration, real-time information sharing, and unified goals across different units. In the maritime industry, internal integration is crucial for aligning logistics, port operations, and administrative functions, thereby enhancing responsiveness and workforce productivity. Studies have shown that firms with high internal integration enjoy better workflow efficiency, faster decision-making, and improved employee morale, as tasks and responsibilities are more clearly defined and supported by real-time data (Flynn, Huo & Zhao, 2020). Internally integrated systems foster knowledge-sharing cultures and reduce duplication of efforts, which helps workers focus on value-adding activities (Danese, Romano & Formentini, 2021). In high-velocity sectors like maritime logistics, internal alignment has been linked to reductions in operational delays and errors, which in turn boosts employee output and satisfaction (Kamalahmadi & Parast, 2021). According to Govindan et al. (2022), a strong internal integration mechanism supports technological adoption and digitalization, which improves not only process efficiency but also the adaptability of employees in dynamic environments. Recent empirical evidence by Olabode and Yusuf (2023) further confirms that the synergy between internal departments significantly contributes to workforce

performance and organizational competitiveness in Nigerian maritime firms.

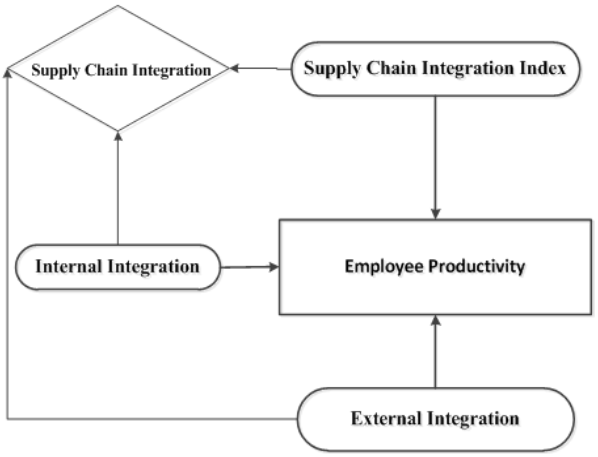
3.4 External Integration

External integration refers to the strategic coordination and collaboration between a firm and its external partners—such as suppliers, customers, logistics providers, regulatory bodies, and service agents—to achieve seamless supply chain performance. In the maritime industry, this includes synchronizing operations with port authorities, freight handlers, customs agencies, and shipping partners. Effective external integration allows for real-time data exchange, better forecasting, streamlined delivery schedules, and proactive issue resolution, which collectively improve service efficiency and employee productivity. Research indicates that firms that foster close partnerships with external entities tend to achieve better operational agility, reduce delays, and enhance employee engagement due to reduced disruptions and clearer work structures (Jajja et al., 2020). According to Dubey et al. (2021), external integration plays a pivotal role in enhancing supply chain visibility and responsiveness, which positively impacts workforce coordination and motivation. Maritime firms with strong external networks are better equipped to handle regulatory requirements and customer demands, thereby reducing employee stress and improving task performance (Wieland & Handfield, 2021). Additionally, Daryanto, Salleh, and Zainal (2022) emphasize that trust and technological connectivity between organizations and their supply chain partners contribute to mutual goals and shared accountability, which fosters a culture of performance across organizational boundaries. In the Nigerian context, Awolusi and Omodero (2023) found that maritime firms that invest in digital collaboration tools and partner integration systems experience substantial gains in operational consistency and employee productivity, especially in congested and complex port environments.

3.5 Employee Productivity

Employee productivity refers to the efficiency and effectiveness with which workers perform their tasks to contribute to the achievement of organizational goals. In the context of maritime firms, productivity encompasses output related to logistics coordination, cargo handling, compliance processing, customer service, and administrative efficiency. It is often measured by indicators such as output per employee, service delivery time, error rates, and goal attainment levels. High employee productivity is typically a result of clear job roles, availability of tools and information, motivation, training, and a supportive organizational environment. As firms strive to optimize operations in highly competitive and regulated sectors like maritime logistics, enhancing employee productivity becomes essential for sustaining profitability and service quality. According to Muogbo and Ogbonna (2020), effective internal processes and external collaboration significantly improve employee work pace and accuracy in Nigerian maritime settings. Additionally, Amah and Ahiauzu (2021) emphasize that employees are more productive when they operate within integrated systems that reduce redundancy and increase task clarity. The integration of digital tools, efficient communication, and seamless coordination—hallmarks of well-integrated supply chains—have been shown to positively influence employee engagement and output (Uzonwanne, 2022). Moreover, Omonona et al. (2023) found that performance-based culture, managerial support, and operational transparency are key factors enhancing productivity in Nigerian transport and logistics firms. Lastly, Ezeani and Akinyemi (2023) affirm that employee productivity in maritime environments is directly tied to how well operational systems and human capital are aligned through collaborative and integrated approaches.

3.6 Conceptual Framework



(Source: Researcher's Construct, 2025)

Fig. 1: Conceptual framework on supply Chain integration and employee production in Maritime firms.

3.7 Theoretical Review

3.7.1 Goal-Setting Theory of Productivity

This study is anchored on the Goal-Setting Theory of Productivity, originally developed by Locke and Latham (1990), which posits that specific and challenging goals, when accepted and supported by appropriate feedback mechanisms, lead to higher levels of employee performance and productivity. The theory emphasizes the motivational role of clearly defined objectives, adequate task information, and effective communication—factors that are central to an integrated supply chain system. In maritime firms, internal supply chain integration ensures that employees have access to clear operational goals, coordinated activities, and standardized procedures, which reduces ambiguity and enhances focus. Similarly, external integration with suppliers, port authorities, and customers provides real-time feedback and expectations that further align employees' efforts with organizational goals. This interconnectedness reinforces a goal-oriented work environment that enhances individual and team productivity. Recent studies such as those by Tabiu and Nura (2021) confirm that when employees in complex sectors like maritime logistics understand their roles within an integrated system and receive consistent performance feedback, their productivity significantly improves. Moreover, Omisore and Adeleke (2022) found that goal clarity and supply chain support structures correlate positively with output levels among workers in Nigerian port-based enterprises. Therefore, Goal-Setting Theory provides a robust lens for examining how supply chain integration mechanisms contribute to enhanced productivity by shaping goal-directed behavior, improving role clarity, and fostering a culture of continuous performance improvement within maritime firms.

3.8 Empirical Review

Adewuyi and Oke (2020) conducted a study titled "Supply Chain Integration and Organizational Performance in Nigerian Shipping Companies" with a focus on how supply chain integration affects operational outcomes. The researchers employed a survey research design using structured questionnaires administered to 200 employees from five shipping firms in Lagos. The study applied multiple regression analysis to test the relationship between internal and external supply chain integration and organizational performance indicators, including employee efficiency. Their findings revealed that internal integration had a statistically significant positive effect on operational efficiency, while external integration was more influential in improving customer satisfaction. However, their study measured firm-level performance without explicitly isolating employee productivity. This current study aims to fill that gap by focusing specifically on employee-level productivity and not just general organizational outcomes.

Ogunleye and Salami (2021) examined the impact of internal communication and inter-departmental collaboration on employee productivity in Nigeria's transport logistics sector. Their study used a cross-sectional survey approach and collected data from 150 logistics personnel working in inland dry ports and maritime support facilities. Using Pearson correlation and structural equation modeling, the authors found that effective internal integration, such as shared databases and real-time information flow, significantly boosted employee task accuracy and reduced redundancy. While their findings are relevant, the study was

restricted to dry port logistics and did not consider external supply chain partnerships such as those with customs, freight agents, or shipping lines. The current study extends this by incorporating both internal and external integration elements within maritime firms, offering a more holistic view of supply chain integration's influence on productivity.

In a study by Udo and Etim (2022), on "external partnerships and workforce efficiency in the Nigerian Maritime Subsector", the focus was on assessing how supplier and customer relationship management affect employee efficiency. The study used a purposive sampling technique to select 120 employees across four marine freight companies in Port Harcourt. Using regression analysis, the authors discovered that well-managed external supply chain partnerships enhance job delivery timelines and reduce work-related errors among employees. Although insightful, the study lacked a comprehensive index to measure supply chain integration holistically, particularly the interplay between internal and external elements. Your current study addresses this methodological limitation by using a Supply Chain Integration Index that incorporates both dimensions while specifically targeting their direct effect on employee productivity.

Ezenwa and Oghene (2023) explored the link between technological integration and employee performance in seaport operations in Delta and Rivers States. With a sample size of 180 port administrative and logistics staff, the authors utilized a mixed-methods approach involving both questionnaires and in-depth interviews. Their findings indicated that digital platforms facilitating integration (such as port community systems) led to higher employee output and reduced task delays. However, their analysis focused primarily on technological platforms rather than integration as a strategic operational concept involving collaboration, planning, and information sharing. The current study builds on this by emphasizing strategic supply chain integration (internal and external) as a multidimensional construct rather than a purely technological one, thus expanding the theoretical and practical implications.

Chukwu and Bassey (2024) recently studied employee productivity and operational practices in marine cargo handling firms in Nigeria. Using a descriptive survey design and stratified sampling, the authors collected data from 250 dockworkers and administrative staff across Apapa and Warri ports. Their results, analyzed through ANOVA, showed that clear role definition and interdepartmental communication were key drivers of employee productivity. While these elements overlap with internal integration, the study did not investigate how external actors in the supply chain (e.g., customs brokers, shipping agents) influence productivity. This omission presents a significant gap that your study addresses by analyzing both internal and external supply chain integration dimensions and their joint influence on productivity, specifically in the maritime sector.

3.9 Appraisal of Reviewed Literature

The conceptual, theoretical, and empirical reviews collectively underscore the critical role of supply chain integration—particularly internal and external integration—in shaping employee productivity within maritime firms. Conceptually, supply chain integration enhances information flow, inter-departmental collaboration, and strategic alignment with external partners, all of which are vital for improved workforce efficiency. Theoretically, this study is anchored on the Goal-Setting Theory of Productivity, which emphasizes that clearly defined goals, feedback, and coordination—elements reinforced by supply chain integration—motivate employees toward higher productivity. Empirically, prior studies (e.g., Adewuyi & Oke, 2020; Udo & Etim, 2022) have confirmed positive relationships between supply chain practices and organizational performance but often focused on firm-level outcomes, technological integration alone, or limited dimensions of integration. Notably, few studies have systematically measured supply chain integration using a comprehensive index while linking it directly to employee productivity in the maritime sector of Nigeria. This study, therefore, fills this vital gap by holistically examining the influence of internal and external integration—as captured by a Supply Chain

Integration Index—on employee productivity, thereby contributing a focused and sector-specific analysis to the body of knowledge.

IV. METHODOLOGY

The study adopted a descriptive survey research design, which was considered appropriate for collecting quantitative data to examine the relationship between supply chain integration and employee productivity in maritime firms in Nigeria. The population of the study comprised 9,540 employees working across various departments in selected maritime firms operating within Nigeria's coastal regions. To determine the sample size, the Krejcie and Morgan (1970) sample size determination table was utilized, yielding a representative sample size of approximately 370 respondents. A stratified random sampling technique was employed to ensure that different job roles, departments, and firm categories were proportionally represented in the sample. Data were collected through the administration of structured questionnaires, which were personally distributed to enhance response rate and authenticity. The research instrument was a researcher-developed questionnaire structured into sections addressing the study variables: supply chain integration (internal and external) and employee productivity. To ensure content validity, the instrument was reviewed and validated by three experts in supply chain management, human resource development, and educational measurement. The reliability of the instrument was determined through a pilot study involving 30 non-sampled employees in a similar maritime setting, and the Cronbach's Alpha coefficient yielded a reliability index of 0.79, indicating acceptable internal consistency. For data analysis, descriptive statistics such as frequency, percentage, mean, and standard deviation were used for demographic profiling and item analysis, while inferential statistics such as Pearson Product-Moment Correlation and multiple regression analysis were used to test the formulated hypotheses and determine the predictive strength of the independent variables on employee productivity at a 0.05 significance level using EViews version 9.

Model Specification

To investigate the effect of supply chain integration on employee productivity in maritime firms in Nigeria, the following multiple linear regression model was specified:

$$EP=\beta_o+\beta_1 SCII+\beta_2 II+\beta_3 EI+\varepsilon$$

Where:
EP = Employee Productivity (Dependent Variable)
SCII = Supply Chain Integration Index
II = Internal Integration
EI= External Integration
β_o= Intercept (constant)
β_1,β_2,β_3 = Coefficients representing the effect of each independent variable
ε = Error term capturing unobserved influences

V. RESULT AND DISCUSSION

The presentation of results in this section reflects the analysis of data collected from respondents to examine the relationship between supply chain integration and employee productivity in maritime firms in Nigeria.

Table 1: Analysis of Questionnaire

Questionnaire	Frequency	Percentage
Returned	293	79.19%
Not used	77	20.81%
Total Distributed	370	100%

Source: Researcher's compilation, 2025

Table 1 presents the analysis of the questionnaire distribution and response rate. Out of the 370 questionnaires distributed to respondents in maritime firms, 293 were successfully returned and found usable for analysis, representing a high response rate of 293 (79.19%). On the other hand, 77 (20.81%) of the questionnaires were either not returned or deemed invalid and thus not included in the final analysis. This overall return rate indicates a good level of participation and provides a reliable dataset for drawing meaningful conclusions in the study.

Table 2: Respondents rate of Responses to question statement

S/N	Question Statement	SA	A	U	D	SD	Total
SCII1	Our firm maintains a centralized platform for sharing supply chain data across departments.	52 (17.75%)	38 (12.97%)	97 (33.11%)	32 (10.92%)	74 (25.26%)	293 (100%)
SCII2	There is seamless coordination among procurement, logistics, and operations units in our supply chain.	24 (8.19%)	63 (21.5%)	102 (34.81%)	46 (15.7%)	58 (19.8%)	293 (100%)
SCII3	Our firm regularly updates its supply chain strategy to align with industry trends.	118 (40.27%)	84 (28.67%)	28 (9.56%)	9 (3.07%)	54 (18.43%)	293 (100%)
SCII4	Performance metrics are shared across departments to monitor supply chain goals.	40 (13.65%)	81 (27.65%)	58 (19.8%)	84 (28.67%)	30 (10.24%)	293 (100%)
SCII5	Decision-making in supply chain processes is based on integrated information systems.	27 (9.22%)	2 (0.68%)	151 (51.54%)	60 (20.48%)	53 (18.09%)	293 (100%)
SCII6	Supply chain partners are involved in strategic planning sessions.	66 (22.53%)	26 (8.87%)	24 (8.19%)	117 (39.93%)	60 (20.48%)	293 (100%)
II1	Different departments work collaboratively on supply chain decisions.	41 (13.99%)	136 (46.42%)	5 (1.71%)	59 (20.14%)	52 (17.75%)	293 (100%)
II2	Inventory and production departments share real-time data.	80 (27.3%)	65 (22.18%)	96 (32.76%)	32 (10.92%)	20 (6.83%)	293 (100%)
II3	Employees communicate across units to improve workflows.	30 (10.24%)	69 (23.55%)	51 (17.41%)	52 (17.75%)	91 (31.06%)	293 (100%)
II4	Internal supply chain activities are closely monitored.	52 (17.75%)	6 (2.05%)	163 (55.63%)	39 (13.31%)	33 (11.26%)	293 (100%)
II5	There is consistency in supply chain goals across functional units.	65 (22.18%)	41 (13.99%)	20 (6.83%)	53 (18.09%)	114 (38.91%)	293 (100%)
EI1	We regularly exchange demand and inventory information with suppliers.	1 (0.34%)	86 (29.35%)	89 (30.38%)	45 (15.36%)	72 (24.57%)	293 (100%)
EI2	We share delivery schedules and forecasts with external partners.	41 (13.99%)	20 (6.83%)	37 (12.63%)	60 (20.48%)	135 (46.08%)	293 (100%)
EI3	There is mutual trust between our organization and key partners.	9 (3.07%)	68 (23.21%)	41 (13.99%)	40 (13.65%)	135 (46.08%)	293 (100%)
EI4	We involve suppliers and customers in planning.	175 (59.73%)	49 (16.72%)	22 (7.51%)	33 (11.26%)	14 (4.78%)	293 (100%)
EI5	Strategic partnerships with stakeholders are prioritized.	26 (8.87%)	69 (23.55%)	109 (37.2%)	31 (10.58%)	58 (19.8%)	293 (100%)
EP1	Employees meet their performance targets regularly.	22 (7.51%)	50 (17.06%)	33 (11.26%)	165 (56.31%)	23 (7.85%)	293 (100%)
EP2	Staff complete supply chain tasks efficiently and on time.	25 (8.53%)	27 (9.22%)	88 (30.03%)	116 (39.59%)	37 (12.63%)	293 (100%)
EP3	Employees are innovative and solve problems effectively.	46 (15.7%)	151 (51.54%)	64 (21.84%)	26 (8.87%)	6 (2.05%)	293 (100%)
EP4	Employees are committed to achieving operational goals.	52 (17.75%)	6 (2.05%)	104 (35.49%)	58 (19.8%)	73 (24.91%)	293 (100%)
EP5	Staff productivity improved due to better supply chain coordination.	8 (2.73%)	109 (37.2%)	86 (29.35%)	53 (18.09%)	37 (12.63%)	293 (100%)

Source: Researcher's compilation, 2025

Table 2 provides insights into how respondents evaluated statements related to Supply Chain Integration Index (SCII), Internal Integration (II), External Integration (EI), and Employee Productivity (EP). For SCII1, a total of 90 respondents agreed (SA + A = 52 + 38 = 90 or

30.72%), 97 were neutral (33.11%), while 106 disagreed (D + SD = 32 + 74 = 106 or 36.18%). Similarly, SCII3 showed the strongest agreement, with 202 (68.94%) agreeing, only 28 (9.56%) remaining neutral, and 63 (21.5%) disagreeing. In contrast, SCII6 revealed weak agreement with only 92 (31.4%) in favor, 24 (8.19%) neutral, and a large proportion (177 or 60.4%) disagreeing.

For Internal Integration, II1 showed strong agreement (177 or 60.41%), 5 (1.71%) neutral, and 111 (37.9%) disagreed. II3 reflected moderate support with 99 (33.79%) agreement, 51 (17.41%) neutral, and 143 (48.8%) disagreement. II5 showed only 106 (36.17%) agreeing, 20 (6.83%) neutral, and 167 (57%) disagreeing, indicating a lack of consistency in internal goals across units.

On External Integration, a concerning trend emerged: for EI2 and EI3, only 61 (20.82%) and 77 (26.28%) agreed respectively, while a significant majority, 195 (66.56%) and 175 (59.73%) disagreed, showing low trust and collaboration with external partners. Even EI5, which measures strategic partnerships, had just 95 (32.42%) agreement against 89 (30.38%) neutral and 89 (30.38%) disagreement.

Regarding Employee Productivity, EP3 stood out positively with 197 (67.24%) agreement and only 32 (10.92%) disagreement. However, EP1 and EP2 raised concerns: EP1 had only 72 (24.57%) agreement, 33 (11.26%) neutral, and 188 (64.17%) disagreement; EP2 also saw high disagreement at 153 (52.22%). In nutshell, while internal coordination showed fair strength, the findings reveal substantial gaps in external integration and employee performance consistency, highlighting critical areas for managerial attention in the maritime sector.

Table 3: Correlation Matrix of the Variables

Variables	SCII	II	EI	EP
SCII	1.000			
II	0.387	1.000		
EI	0.790	0.153	1.000	
EP	0.348	0.642	0.854	1.000

Source: Researcher's compilation, 2025

Table 3 presents the correlation matrix showing the strength and direction of relationships among the variables: Supply Chain Integration Index (SCII), Internal Integration (II), External Integration (EI), and Employee Productivity (EP). The results indicate that External Integration (EI) has the strongest positive correlation with Employee Productivity (EP) (r = 0.854), suggesting that increased collaboration and communication with external partners significantly enhance employee performance in maritime firms. Internal Integration (II) also shows a strong positive correlation with EP (r = 0.642), implying that coordination among departments contributes positively to productivity. The relationship between SCII and EP is positive but weaker (r = 0.348), indicating that while supply chain integration overall influences productivity, its effect is more indirect or possibly mediated by internal and external integration. Notably, SCII has a strong correlation with EI (r = 0.790), highlighting that external integration may be a key driver of overall supply chain integration. These results suggest that while all dimensions of supply chain integration contribute to employee productivity, external and internal integrations play more direct roles in performance outcomes within the studied maritime firms.

Table 4: Summary of Multiple Regression Analysis for Hypotheses 1, 2 & 3.

Dependent Variable: EP				
Method: Least Squares				
Date: 06/12/25 Time: 20:43				
Sample: 293				
Included observations: 293				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.517881	0.030717	16.86003	0.0000
SCII	0.227425	0.067277	3.380445	0.0008
II	0.748607	0.077192	9.697997	0.0000
EI	-0.183406	0.088440	-2.073777	0.0390
R-squared	0.963155	Mean dependent var		2.917406
Adjusted R-squared	0.862772	S.D. dependent var		1.038507
S.E. of regression	0.200375	Akaike info criterion		-0.363697
Sum squared resid	11.60336	Schwarz criterion		-0.313456
Log likelihood	57.28166	Hannan-Quinn criter.		-0.343575
F-statistic	2518.204	Durbin-Watson stat		1.712984
Prob(F-statistic)	0.000000			

Source: EViews 9.0 Output, 2025

The summary of the multiple regression analysis in Table 4 evaluates the influence of Supply Chain Integration Index (SCII), Internal Integration (II), and External Integration (EI) on Employee Productivity (EP) in maritime firms. Among the predictors, Internal Integration (II) has the strongest and most statistically significant positive effect on EP ($\beta = 0.7486$, $p < 0.0001$), meaning improved internal coordination greatly boosts productivity. SCII also shows a significant positive impact ($\beta = 0.2274$, $p = 0.0008$), indicating that overall supply chain integration contributes positively to productivity. Interestingly, External Integration (EI) has a statistically significant but negative effect on EP ($\beta = -0.1834$, $p = 0.0390$), suggesting that, in the current context, external partnerships may be facing implementation challenges or inefficiencies that reduce productivity. This finding highlights a critical area for managerial attention. The Durbin-Watson statistic (1.71) is close to 2, suggesting minimal autocorrelation in the residuals.

The R-squared value of 0.963 implies that approximately 96.3% of the variation in employee productivity is accounted for by SCII, II, and EI, showing a highly explanatory model. The model is statistically significant overall, as indicated by the F-statistic (2518.204) and its p-value (0.000000), confirming that the independent variables jointly explain variations in employee productivity. The regression model is robust and reveals that while internal integration and SCII enhance employee productivity, external integration may be due to external varying factor which is not at the disposal of current study require reevaluation.

IV. DISCUSSION OF FINDINGS

H_1: Supply Chain Integration Index (SCII) has no significant effect on Employee Productivity (EP).

The result from the regression analysis reveals that SCII has a significant positive effect on employee productivity ($\beta = 0.227$, $p < 0.01$), leading to the rejection of the null hypothesis. This indicates that greater supply chain integration across departments—such as data sharing, aligned strategy, and coordinated decision-making—enhances employee performance. This finding is consistent with the work of Wiengarten et al. (2020), who concluded that integrated supply chain systems improve resource access and employee output. Kusi-Sarpong et al. (2022) also support this outcome, asserting that supply chain synchrony fosters a productive work environment by

reducing redundancies. Similarly, Zhou, Shou, and Zhu (2023) emphasized the role of digital SCII tools in boosting responsiveness and efficiency at the employee level. However, Al-Mashari et al. (2021) cautioned that in regions with poor infrastructure or change resistance, SCII alone may not translate directly to performance gains unless supported by organizational readiness. This study confirms that in the context of maritime firms in Delta State, Nigeria, SCII is a critical enabler of employee productivity, although infrastructure readiness remains a potential contextual factor.

H_2: Internal Integration (II) has no significant effect on Employee Productivity (EP).

The findings indicate that internal integration has a strong and significant positive effect on employee productivity ($\beta = 0.749$, $p < 0.001$), leading to the rejection of the null hypothesis. This suggests that synchronized efforts between internal departments, such as shared goals, real-time data access, and collaboration in decision-making, significantly enhance workers' efficiency and task completion. This aligns with Flynn, Huo, and Zhao (2019), who posited that internal integration streamlines workflows, thus increasing employee performance. Similarly, Kim and Lee (2021) observed that firms with highly integrated internal systems reported greater innovation and lower process delays. Jajja et al. (2020) supported this by showing that internal alignment fosters employee commitment and goal orientation. However, Singh and Modgil (2022) argued that while internal integration improves efficiency, its benefits depend heavily on organizational culture and communication quality, which may not be uniformly present in developing regions. Thus, this study extends the literature by demonstrating that internal integration remains a dominant driver of employee productivity even in less-developed operational contexts like Delta State.

H_3: External Integration (EI) has no significant effect on Employee Productivity (EP).

Interestingly, the regression result shows that external integration has a significant but negative effect on employee productivity ($\beta = -0.183$, $p < 0.05$), thus rejecting the null hypothesis but suggesting an inverse relationship. This implies that efforts to integrate suppliers, customers, and external partners may be experiencing friction that inadvertently hampers employee efficiency. This contrasts with findings by Zhou and Benton (2020), who argued that trust and joint planning with external stakeholders enhance workflow predictability and thus productivity. Similarly, Fynes et al. (2021) found positive outcomes when strategic partners were involved in collaborative forecasting and delivery planning. However, Ogunyemi and Oloruntoba (2023) observed that in many African firms, external integration is often hindered by poor communication infrastructure, misaligned objectives, and lack of transparency, which may demotivate staff or increase complexity in task execution. This study aligns with the latter viewpoint, suggesting that in the Delta State context, external integration may currently be suboptimal and needs structured interventions to turn into a productivity enhancer rather than a detractor.

Summary

This study examined the impact of Supply Chain Integration—operationalized as Supply Chain Integration Index (SCII), Internal Integration (II), and External Integration (EI)—on Employee Productivity (EP) among selected maritime firms in Delta State, Nigeria. Anchored on the Productivity Theory, the study adopted a quantitative survey research design. The population comprised 9,540 employees, from which a sample size of 370 was determined using the Krejcie and Morgan sampling table, with 293 valid responses retrieved. Data were collected using a structured questionnaire, validated by experts and confirmed reliable with a Cronbach's Alpha coefficient of 0.79. The study employed descriptive statistics, correlation analysis, and multiple regression (OLS) techniques for data analysis. The findings show that:

i. Supply Chain Integration Index (SCII) has a significant positive effect on employee productivity ($\beta = 0.227$, $p = 0.0008$), indicating that broader supply chain

coordination enhances individual performance.

ii. Internal Integration (II) has a strong and significant positive effect on employee productivity ($\beta = 0.749$, $p < 0.0001$), suggesting that collaboration and alignment within organizational units substantially boost productivity levels.

iii. External Integration (EI) has a significant but negative effect on employee productivity ($\beta = -0.183$, $p = 0.0390$), implying that poorly managed relationships with external partners (e.g., suppliers and customers) may hinder employee efficiency.

IV. CONCLUSION

The study concluded that effective supply chain integration significantly influences employee productivity in maritime firms within Delta State, Nigeria. Specifically, the findings affirm that both the Supply Chain Integration Index (SCII) and Internal Integration (II) contribute positively and significantly to improving employee output, collaboration, and task efficiency. Conversely, while External Integration (EI) was statistically significant, its negative coefficient suggests that poor coordination or trust issues with external partners may hamper employee performance. These results underscore the importance of strong internal structures and harmonized operations across departments, while also highlighting the need to improve the quality of external relationships for holistic supply chain performance. Thus, firms aiming to boost productivity should invest more in internal data sharing, cross-functional collaboration, and strategic alignment, while simultaneously fostering trustworthy and well-coordinated relationships with external stakeholders.

RECOMMENDATIONS

Based on the findings of this study, which examined the relationship between supply chain integration and employee productivity in maritime firms in Nigeria, the following recommendations are offered to enhance both supply chain effectiveness and workforce performance:

i. Maritime firms should enhance internal integration by investing in real-time data sharing systems and fostering interdepartmental collaboration to streamline supply chain operations and boost employee productivity.

ii. Companies should establish structured partnerships with key external stakeholders by improving communication, trust, and shared planning to positively impact workforce efficiency and output.

iii. Managers should regularly assess and align their supply chain integration strategies with evolving industry standards and employee performance goals to ensure continuous operational improvement.

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The Anamorphosisverse: A Meta-Space Framework for Understanding Perspective Transformations in Digital Visual Realms

Vitor Lima

ABSTRACT

This article introduces the concept of "anamorphosisverse" as a meta-space framework that encompasses the system of transformations, relations, and perspective shifts connecting all possible viewpoints and visual configurations.

Building upon previous research on Pixelverse (the totality of digital visual content) and Visualverse (the domain of visual meaning beyond technical materiality), this paper positions the anamorphosisverse as an integrative conceptual framework with significant implications for understanding how meaning emerges through perspective-dependent transformations rather than perspective-independent properties.

Through interdisciplinary analysis drawing from semiotics, media theory, epistemology, and aesthetics, the article demonstrates how the anamorphosis-verse framework offers valuable approaches to navigating increasingly complex visual environments characterized by perspective transformation rather than perspective stability.

Keywords: anamorphis verse, pixelverse, visualverse, perspective transformation, visual epistemology, digital aesthetics, anamorphosis, visual semiotics.

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I. INTRODUCTION

Contemporary visual culture increasingly features dynamic, interactive, and perspective-dependent experiences.

From immersive virtual environments and augmented reality overlays to algorithmically curated media feeds and complex data visualizations, our engagement with the visual world is less about observing static representations from fixed viewpoints and more about navigating complex landscapes of shifting perspectives.

This change requires new ways of thinking that can effectively address how the creation of visual meaning is being transformed in digital environments.

Building upon prior research on the concepts of Pixelverse, the totality of digital visual content constituted by pixels, and Visualverse, the broader domain of visual meaning that emerges from cultural, cognitive, and social interactions with visual forms, transcending mere technical materiality, this article introduces the concept of the anamorphosisverse.

We propose the anamorphosisverse as a meta-space framework that encompasses the system of transformations, relations, and perspective shifts connecting all possible viewpoints and visual configurations within and between the Pixelverse and Visualverse.

This concept derives from the historical technique and epistemological metaphor of anamorphosis, which is traditionally understood as a distorted projection that necessitates a specific vantage point for accurate perception.

However, we extend this notion beyond fixed points to encompass the dynamic, relational, and often participatory nature of perspective in contemporary digital environments.

The anamorphosisverse is conceived not simply as a collection of perspectives, but as the underlying structure that enables potential transformations among them - the very fabric of perspectival possibility.

The primary research question guiding this inquiry is:

How can the concept of the anamorphosis versa serve as an integrative framework for understanding the relationship between the material substrate of the Pixelverse, the emergent meaning structures of the Visualverse, and the dynamic processes of perspective transformation that characterize contemporary visual experience?

Our objective is to define the anamorphosisverse, articulate its relationship to Pixelverse and Visualverse, explore its theoretical foundations, and demonstrate its utility for analyzing visual phenomena and addressing contemporary challenges.

This article proceeds as follows:

Section 2 traces the conceptual lineage from historical anamorphosis to the proposed anamorphosisverse.

Section 3 provides a detailed exposition of the triadic framework that interconnects the Pixelverse, Visualverse, and Anamorphosisverse.

Section 4 explores in depth the mathematical and philosophical foundations of the framework.

Section 5 analyzes perspective transformation as a core mechanism of meaning-making within the anamorphosisverse.

Section 6 discusses applications and implications across various domains, including visual literacy and ethics.

Finally, Section 7 concludes by summarizing the key contributions and outlining future research directions.

II. CONCEPTUAL FOUNDATIONS: FROM ANAMORPHOSIS TO ANAMORPHOSISVERSE

The concept of the anamorphosisverse finds its roots in the historical practice and theory of anamorphosis.

Traditionally, anamorphosis refers to a distorted image that appears coherent only when viewed from a specific vantage point or with a correcting device (Baltrusaitis, 1977); (Lacan, 1978); (Manovich, 2001).

Hans Holbein the Younger's painting "The Ambassadors" (1533), with its famously distorted skull, serves as a canonical example, compelling the viewer to shift position to resolve the visual puzzle.

Beyond a mere visual trick, anamorphosis functions as a powerful epistemological metaphor, highlighting the dependence of perception and knowledge on the observer's position (Lacan, 1978).

It suggests that reality is not absolute but perspectival and that understanding often requires a deliberate shift in viewpoint.

However, traditional anamorphosis, tied to specific physical views and static images, proves insufficient for capturing the complexities of contemporary digital visual environments.

Digital technologies enable dynamic, interactive, and algorithmically mediated perspective shifts that transcend the fixed-point logic of classical anamorphosis.

The observer is often no longer merely repositioning themselves physically but actively interacting with and modifying the visual field itself through interfaces, avatars, and generative processes (Manovich, 2001).

Therefore, we propose an evolution from the concept of anamorphosis to the anamorphosisverse.

While anamorphosis emphasizes the result of distortion from a non-privileged viewpoint, the

anamorphosisverse emphasizes the potential space of transformations between all possible viewpoints.

It is not about a single perspective shift but about the meta-space that encompasses all possible perspective configurations and the transformational relationships between them.

We define the anamorphosisverse as the meta-space that encompasses the system of transformations, relations, and perspective shifts connecting all possible viewpoints and visual configurations.

This definition positions the anamorphosis-verse not as a collection of static perspectives but as a dynamic system of transformational relationships.

It is the space within which perspective navigation occurs, where meaning emerges not through fixed properties but through specific transformations between different perspective positions.

This conceptualization is related to, yet extends beyond, several established theoretical frameworks in visual studies and philosophy.

It resonates with Merleau-Ponty's (1968) phenomenology of perception, which emphasizes the embodied and situated nature of visual experience, but extends this to include technologically mediated and algorithmically shaped perspectives.

It engages with Deleuze's (1986) concept of the movement-image, which highlights the dynamic rather than static character of visual meaning, while placing particular emphasis on perspective transformation as the central mechanism.

It also engages with Flusser's (2000) philosophy of technical images, which analyzes how technical apparatuses shape visual meaning but emphasizes the transformational relationships between different technically mediated perspectives rather than the technical photos and pictures themselves.

The anamorphosis verse thus represents a conceptual evolution that responds to the increasingly dynamic, interactive, and perspective-dependent nature of contemporary visual experience.

By concentrating on the meta-space of perspective transformations, rather than on individual perspectives or static visual properties, this framework is better equipped to elucidate how meaning emerges within environments defined by perspectival fluidity rather than stability.

III. THE TRIADIC FRAMEWORK: PIXELVERSE, VISUALVERSE, AND ANAMORPHOSISVERSE

The anamorphosis verse does not stand alone but functions as part of a triadic framework that includes the previously established concepts of Pixelverse and Visualverse.

Grasping the interrelationships among these three domains is essential for understanding the emergence of visual meaning in contemporary contexts.

The Pixelverse constitutes the material substrate and technical infrastructure that make possible specific visual configurations.

It includes all digital images, videos, interfaces, virtual environments, and other pixel-based visual forms.

The Pixelverse is characterized by its technical materiality, its computational foundations, and its existence as encoded information.

It represents the technical infrastructure that enables digital visual experience but does not fully account for the meaning that emerges through engagement with this infrastructure.

The Visualverse, in contrast, refers to the domain of visual meaning that transcends mere technical materiality.

It encompasses the cultural, cognitive, social, and aesthetic dimensions of visual experience that emerge through engagement with visual forms.

The Visualverse is characterized by its semantic richness, its cultural embeddedness, and its

existence as experienced meaning rather than encoded information.

It represents the domain where visual significance emerges but does not fully account for the transformational processes through which this emergence occurs.

The Anamorphosisverse, as introduced in this article, encompasses the system of transformations, relations, and perspective shifts that connect different viewpoints and visual configurations within and between the Pixelverse and Visualverse.

It is characterized by its transformational nature, its focus on perspective relationships rather than static properties, and its existence as a meta-space of potential perspective movements.

It represents the domain where visual meaning emerges through specific transformations between different perspective positions.

These three concepts form an integrated framework for understanding contemporary visual experience:

The Pixelverse provides the material substrate, the technical infrastructure that enables specific visual configurations.

Without the Pixelverse, there would be no digital visual content to perceive or engage with.

However, the Pixelverse alone cannot account for the meaning that emerges through engagement with this content.

The Visualverse encompasses the semantic dimension of visual content, comprising the cultural frameworks and cognitive processes through which visual phenomena are interpreted and endowed with meaning.

Without the Visualverse, digital visual content would remain mere technical information without significance.

However, the Visualverse alone cannot account for the transformational processes through which meaning emerges.

The Anamorphosisverse provides the transformational dimension, the system of perspective shifts and relationships through which meaning emerges.

Without the Anamorphosisverse, we would lack a framework for understanding how meaning emerges through specific movements between different perspective positions rather than through static properties.

The relationships among these three domains are characterized not by hierarchy, but by mutual interdependence, with each domain influencing and being influenced by the others.

The Pixelverse creates specific material conditions for perspective configurations, influencing what perspective positions become technically possible.

The Visualverse creates specific semantic conditions for perspective interpretation, influencing how perspective positions become culturally meaningful.

The Anamorphosisverse creates specific transformational conditions for perspective navigation, influencing how movement between perspective positions generates new understanding.

This triadic framework offers a more comprehensive approach to understanding contemporary visual experience than any of the concepts in isolation.

By integrating the material substrate of the Pixelverse, the semantic dimension of the Visualverse, and the transformational system of the Anamorphosisverse, we develop a framework that addresses the increasingly complex, dynamic, and perspective-dependent nature of visual meaning-making in digital environments.

IV. MATHEMATICAL AND PHILOSOPHICAL FOUNDATIONS OF THE ANAMORPHOSIS VERSE

The anamorphosisverse, as a meta-space of perspective transformations, can be understood through both mathematical and philosophical

frameworks that illuminate its structural and experiential dimensions.

4.1 Mathematical Foundations

From a mathematical perspective, the anamorphosisverse can be conceptualized using several frameworks from topology, group theory, and differential geometry.

Topologically, the anamorphosisverse can be understood as a manifold of perspective positions, where each point represents a specific perspective configuration, and paths between points represent perspective transformations.

This topological approach enables us to examine several key properties of the system.

First, we can assess connectedness, which tells us whether it is possible to reach any perspective position starting from any other position.

Second, we can evaluate continuity, determining whether transitions between different perspectives occur smoothly or in discrete steps.

Finally, we can analyze dimensionality, identifying how many independent parameters are required to fully specify a particular perspective position.

The work of Thom (1975) on catastrophe theory provides a mathematical framework for understanding how continuous changes in perspective parameters can lead to discontinuous changes in visual meaning, a phenomenon frequently observed in digital environments where minor interface adjustments can dramatically transform visual experience.

Group theory offers another mathematical approach to the Anamorphosisverse, focusing on the transformations between perspective positions rather than the positions themselves.

Different types of perspective transformations - such as rotations, translations, and scalings - can be studied using the mathematical framework of group theory.

In this context, these transformations are treated as group operations, meaning they can be combined in ways that satisfy certain properties: closure (combining any two transformations results in another transformation of the same type), identity (there exists a transformation that leaves the object unchanged), invertibility (every transformation has an inverse that undoes its effect), and associativity (the order in which transformations are grouped does not affect the final result).

This approach, building on Klein's (1872) Erlangen Program, which characterized geometries by their transformation groups, allows us to classify different types of perspective transformations and analyze their compositional properties.

This approach, inspired by Felix Klein's 1872 Erlangen Program, uses transformation groups to characterize and organize different geometries.

By examining which properties remain unchanged (invariant) under specific groups of transformations, we can systematically classify various types of perspective transformations.

This framework also enables us to analyze how these transformations combine and interact, revealing their compositional properties and the relationships between different geometries

For instance, some perspective transformations in digital environments are reversible (allowing a return to previous viewpoints), while others are irreversible (creating one-way perspective shifts).

Differential geometry provides powerful tools for examining the local structure of the Anamorphosisverse.

By focusing on how each perspective position relates to its immediate neighbours, this approach allows us to analyze the fine-grained, continuous variations within the space.

Through concepts such as differentiable manifolds and local coordinates, differential geometry enables a precise understanding of how

perspective changes occur smoothly at a local level.

Concepts such as curvature can describe how perspective space warps around specific configurations, creating regions where perspective navigation follows non-intuitive patterns.

This approach connects to Riemann's (1868) work on manifolds with variable curvature, offering a framework for understanding how the "geometry" of perspective space itself may vary across different regions of the Anamorphosisverse.

These mathematical approaches provide formal tools for analyzing the structural properties of the Anamorphosisverse, offering precise language for describing perspective relationships and transformations.

However, they must be complemented by philosophical frameworks that address the experiential and meaning-making dimensions of perspective navigation.

4.2 Philosophical Foundations

Phenomenologically, the anamorphosisverse connects to traditions that emphasize the embodied and situated nature of perception.

Merleau-Ponty's (1968) concept of the "flesh of the world" describes how perception emerges through the intertwining of perceiver and perceived, with neither entirely separable from the other.

This phenomenological approach allows us to understand that perspective positions are not simply external vantage points, but rather embodied experiences that actively shape both the observer and the observed.

In this view, the act of perceiving from a particular perspective is an interactive process that constitutes the identities and realities of both subject and object.

In digital environments, this embodiment extends to virtual bodies, avatars, and interface positions, creating new forms of "digital flesh" through which perception occurs.

Ontologically, the anamorphosisverse raises questions about the nature of reality itself.

If visual meaning appears through perspective transformations rather than perspective-independent properties, what does this imply about the ontological status of the visual world?

Whitehead's (1929) process philosophy, which prioritizes becoming over being and relations over substances, offers a framework for understanding reality as fundamentally transformational rather than static.

This process-oriented ontology aligns with the anamorphosis'emphasis on transformation as the primary locus of meaning-making.

Epistemologically, the anamorphosisverse challenges traditional notions of objective knowledge.

If understanding emerges through specific perspective transformations, then knowledge cannot be separated from the particular pathways of perspective navigation through which it emerges.

This idea is closely related to Haraway's (1988) concept of "situated knowledges," which asserts that all knowledge claims are inherently partial and shaped by specific perspectives.

According to Haraway, objectivity does not arise from a detached, universal "view from nowhere," but rather from the careful integration and acknowledgment of multiple, contextually situated viewpoints.

The anamorphosisverse extends this by focusing not just on multiple perspectives but on the transformational relationships between them.

Ethically, the anamorphosisverse raises questions about responsibility in perspective navigation.

If meaning arises through particular transformational pathways, it becomes crucial to ask: who exercises control over these pathways, and what ethical responsibilities are inherent in such control?

This is closely related to Jonas's (1984) ethics of responsibility, which underscores that technological power gives rise to new and profound ethical obligations.

Jonas argues that as our capacity to shape the world increases, so too does our responsibility to consider the far-reaching consequences of our actions.

In the context of the anamorphosisverse, those who design systems that shape perspective navigation bear responsibility for the kinds of meaning-making they enable or constrain.

These philosophical frameworks provide conceptual tools for understanding the experiential, ontological, epistemological, and ethical dimensions of the anamorphosisverse.

Combined with the mathematical approaches outlined earlier, they offer a comprehensive foundation for analyzing how meaning emerges through perspective transformation in contemporary visual environments.

V. NAVIGATING THE ANAMORPHOSISVERSE: PERSPECTIVE TRANSFORMATION AS MEANING-MAKING

Within the anamorphosis-verse framework, meaning emerges not through static properties of visual content but through specific transformations between different perspective positions.

This section analyzes how these transformational processes function as mechanisms of meaning-making, developing a typology of perspective transformations and examining empirical evidence for perspective-dependent meaning construction.

5.1 Typology of Perspective Transformations

Based on analysis of various digital visual environments, we identify four primary types of perspective transformations that generate distinctive forms of meaning:

Revelatory transformations occur when movement between perspective positions reveals previously invisible patterns or relationships.

These transformations create meaning through the experience of discovery, where new understanding emerges through specific perspective shifts.

Examples of this phenomenon include data visualizations that reveal patterns discernible only from specific analytical perspectives; virtual environments that disclose hidden elements when observed from particular vantage points; and interface designs that make certain functionalities accessible only through specific sequences of user interaction.

The meaning generated through revelatory transformations is characterized by its emergent quality, the sense that understanding arises not from either perspective position in isolation but from the movement between them.

Integrative transformations occur when movement between perspective positions enables the synthesis of seemingly contradictory viewpoints.

These transformations create meaning through the experience of reconciliation, where new understanding emerges through connecting previously separate or opposing perspectives.

Examples include cross-platform media experiences that integrate different narrative viewpoints, collaborative virtual environments that combine multiple user perspectives, and augmented reality applications that merge physical and digital visual fields.

The meaning generated through integrative transformations is characterized by its synthetic quality, the sense that understanding arises not from selecting among competing perspectives but from finding pathways that connect them.

Generative transformations occur when movement between perspective positions creates entirely new visual configurations rather than merely revealing or connecting existing ones.

These transformations create meaning through the experience of creation, where new understanding emerges through the production of novel perspective positions.

Examples include generative art systems that produce new visual forms through user interaction, procedural virtual environments that construct spaces in response to navigation, and AI-assisted design tools that generate visual possibilities based on user inputs.

The meaning generated through generative transformations is characterized by its creative quality, the sense that understanding arises not from discovering what already exists but from participating in the creation of new visual possibilities.

Recursive transformations occur when movement between perspective positions enables reflection on the perspective process itself.

These transformations create meaning through the experience of meta-awareness, where new understanding emerges through recognizing the perspective-dependent nature of visual experience.

Examples include critical media art that foregrounds the technological mediation of vision, interface designs that make algorithmic curation visible, and virtual environments that allow users to toggle between different rendering modes.

The meaning generated through recursive transformations is characterized by its reflexive quality, the sense that understanding arises not just from what is seen but from awareness of how seeing itself is structured.

These four types of perspective transformation - revelatory, integrative, generative, and recursive - constitute distinct mechanisms by which meaning emerges within the anamorphosisverse.

They are not mutually exclusive but often function in combination with complex visual experiences involving multiple transformation types.

5.2 Empirical Evidence for Perspective-Dependent Meaning Construction

Empirical research across various fields provides evidence for how meaning emerges through perspective transformation rather than static visual properties.

Studies in human-computer interaction demonstrate how users construct meaning through specific interaction sequences rather than static interface elements.

Eye-tracking research conducted by Holmqvist et al. (2011) demonstrates that visual understanding frequently arises not from fixating on individual elements, but from the specific scanning patterns that occur between elements.

Similarly, interaction design research by Dourish (2004) demonstrates how meaning emerges through embodied engagement with interfaces rather than passive reception of visual information.

Research in virtual reality offers particularly compelling evidence for the perspective-dependent construction of meaning.

Studies by Slater and Wilbur (1997) on presence in virtual environments demonstrate that the sense of "being there" arises not from static visual properties, but from specific patterns of sensorimotor contingency—that is, from the dynamic relationships between user movements and the resulting shifts in perspective.

More recent work by Bailenson (2018) demonstrates how specific perspective transformations in virtual environments can generate empathy, suggesting that emotional meaning emerges through particular pathways of perspective navigation.

Studies in data visualization demonstrate that understanding emerges not from any single visualization, but through specific transformations between different views of the data.

Research by Heer and Shneiderman (2012) on interactive visualization demonstrates that insight

frequently arises during transitions between different data perspectives, rather than from viewing static representations.

This finding supports the anamorphosis-averse framework's emphasis on transformation, rather than static perspective, as the primary locus of meaning-making.

Research in cognitive science offers neurological evidence supporting the perspective-dependent construction of meaning.

Studies on change blindness by Simons and Levin (1997) demonstrate that visual awareness depends not only on the contents of the visual field, but also on specific attentional shifts between different aspects of that field.

Work on predictive processing by Clark (2013) suggests that perception itself involves continuous prediction and error correction through perspective adjustment rather than passive reception of visual information.

Collectively, this empirical research supports the anamorphosisverse framework's central claim that meaning emerges through specific transformations between perspective positions rather than through static visual properties.

It demonstrates how understanding in contemporary visual environments depends not just on what is seen but on the particular pathways of perspective navigation through which seeing occurs.

5.3 Theoretical Model for Anamorphosisverse Navigation

Based on the typology of perspective transformations and empirical evidence discussed above, we propose a theoretical model for understanding navigation through the anamorphosisverse.

This model conceptualizes perspective navigation as occurring across four dimensions:

Spatial navigation involves movement between different spatial viewpoints, whether physical positions, virtual camera positions, or abstract spatial representations.

This dimension encompasses traditional anamorphic techniques but extends to the complex spatial navigation enabled by digital technologies.

Temporal navigation involves movement between different temporal perspectives, including changes in playback speed, historical viewpoints, predictive visualizations, and temporal scaling.

This dimension addresses how meaning emerges through specific patterns of temporal perspective transformation.

Semantic navigation involves movement between different interpretive frameworks, including shifts between cultural contexts, disciplinary perspectives, and conceptual models.

This dimension addresses how meaning emerges through transformations in the interpretive lenses applied to visual content.

Participatory navigation involves movement between different modes of engagement, from passive viewing to active modification of visual content.

This dimension addresses how meaning emerges through transformations in the observer's role and agency within the visual system.

These four dimensions -spatial, temporal, semantic, and participatory - constitute the primary axes along which navigation within the anamorphosisverse takes place.

Specific perspective transformations typically involve movement along multiple dimensions simultaneously, creating complex trajectories through the meta-space of possible perspectives.

This theoretical model provides a framework for analyzing how specific pathways of perspective navigation generate particular forms of meaning.

It suggests that understanding in contemporary visual environments emerges not through occupying ideal viewpoints but through navigating productive trajectories through the Anamorphosisverse, trajectories that enable

revelatory, integrative, generative, or recursive transformations.

VI. APPLICATIONS AND IMPLICATIONS

The anamorphosisverse framework has significant applications and implications across various domains, from visual literacy and interface design to addressing contemporary challenges of information complexity and establishing ethical guidelines for perspective navigation.

6.1 Implications for Visual Literacy

Traditional approaches to visual literacy have often focused on developing fixed interpretive skills rather than capabilities for perspective navigation.

The anamorphosisverse framework suggests an alternative approach focused on developing what might be called "anamorphic literacy" - the capability to navigate effectively between different perspective positions and derive meaning from these transformational processes.

This approach to visual literacy would emphasize developing the following:

Perspective recognition capabilities: Skills for identifying specific perspective positions and their limitations, recognizing how particular viewpoints shape what becomes visible and what remains hidden.

Perspective navigation capabilities: Skills for moving effectively between different perspective positions, including the ability to find productive pathways through the Anamorphosisverse that generate revelatory, integrative, generative, or recursive transformations.

Perspective creation capabilities: Skills for constructing new perspective positions rather than merely selecting among existing ones, including the ability to combine elements from different perspectives to create novel viewpoints.

Meta-perspective awareness: Skills for understanding how different perspective positions relate within larger systems, including awareness of how power relationships shape which perspectives become dominant and which remain marginalized.

Educational approaches based on this framework would focus less on teaching fixed interpretive codes and more on developing capabilities for effective perspective navigation.

This may involve exercises that encourage movement between different disciplinary perspectives, projects that entail the creation of new perspective positions, and analytical frameworks designed to identify how specific configurations of perspective shape understanding.

6.2 Applications to Design

The Anamorphosisverse framework has significant implications for the design of visual interfaces, environments, and systems.

Rather than optimizing for ideal viewpoints, design might instead prioritize the creation of productive pathways for perspective navigation - trajectories through the Anamorphisverse that facilitate meaningful transformations.

This approach to design would emphasize:

Perspective diversity: Creating systems that offer multiple perspective positions rather than privileging single viewpoints, enabling users to navigate between different ways of seeing.

Transformational affordances: Designing interfaces that make perspective transformation intuitive and meaningful, with clear connections between user actions and resulting perspective shifts.

Navigation guidance: Providing cues that help users find productive pathways through the Anamorphosisverse without overly constraining their freedom to explore alternative routes.

Transformation visibility: Emphasizing the visibility of perspective transformations themselves, rather than rendering them transparent, enables users to develop meta-awareness of how their navigation between perspectives shapes their understanding.

Practical applications may include data visualization systems that highlight transitions between different views rather than relying on static representations; virtual environments intentionally designed around perspective transformation rather than fixed viewpoints; and social media interfaces that facilitate movement between diverse cultural or ideological perspectives, rather than reinforcing filter bubbles.

6.3 Addressing Contemporary Challenges

The anamorphosisverse framework offers valuable approaches to addressing contemporary challenges of information complexity, polarization, and technological transformation.

For navigating information complexity, the framework suggests focusing not on accumulating more information but on developing more sophisticated pathways of perspective navigation.

This could involve developing systems that facilitate integrative transformations across diverse information sources, or implementing educational approaches that cultivate the ability to identify revelatory perspective shifts - those that illuminate patterns within complex data landscapes.

For addressing polarization, the framework suggests focusing not on convincing others to adopt particular perspectives but on creating pathways of perspective navigation that enable movement between opposing viewpoints.

This could entail designing media platforms that support integrative transformations between diverse ideological positions, or developing dialogue processes structured around specific protocols for navigating between perspectives.

For navigating technological transformation, the framework suggests focusing not on predicting fixed futures but on developing capabilities for adaptive perspective navigation as technologies evolve.

This could involve developing foresight methodologies that emphasize the exploration of multiple perspective positions, rather than privileging expert predictions, or designing technologies that make their perspective-shaping effects visible rather than transparent.

6.4 Ethical Considerations

The anamorphosisverse framework raises significant ethical questions regarding responsibility in the navigation and creation of perspectives.

If meaning emerges through specific transformations between perspective positions, then those who design systems that shape these transformations bear significant ethical responsibility.

Key ethical considerations include:

Perspective access: Who has access to different perspective positions, and how might this access be made more equitable?

This encompasses not only questions of technological access, but also considerations of the social, educational, and cultural conditions that enable effective perspective navigation.

Perspective manipulation: What constitutes ethical versus manipulative guidance of perspective navigation?

This includes questions concerning the transparency of how systems shape perspective pathways, as well as issues of consent in the process of perspective transformation.

Perspective diversity: What responsibility do designers, educators, and policymakers have for maintaining diverse perspective ecosystems rather than allowing perspective homogenization?

This also raises questions about the preservation of minority perspectives and the prevention of dominance by any single viewpoint.

Perspective harm: How should we address the potential for harm through exposure to certain perspective positions or transformations?

This includes considerations of potentially traumatic perspective experiences, as well as the challenge of balancing protection from harm with the freedom to navigate between perspectives.

These ethical considerations suggest the need for developing frameworks of "perspective ethics" that address the specific challenges of designing for and navigating through the anamorphosisverse.

Such frameworks would focus not just on the content of visual systems but on the transformational pathways they enable or constrain.

VII. CONCLUSION

This article has introduced the concept of the anamorphosisverse as a meta-space framework for understanding perspective transformations in digital visual realms.

Building upon previous research on Pixelverse and Visualverse, we have positioned the anamorphosisverse as an integrative conceptual framework that addresses how meaning emerges through specific transformations between perspective positions rather than through static visual properties.

The key contributions of this work include:

1. Defining the anamorphosisverse as the meta-space that encompasses the system of transformations, relations, and perspective shifts connecting all possible viewpoints and visual configurations.
2. Articulating the triadic relationship between Pixelverse (as material substrate), Visualverse (as semantic dimension), and Anamorphosisverse (as transformational system).
3. Developing mathematical and philosophical foundations for understanding the structural and experiential dimensions of the anamorphosisverse.
4. Analyzing how meaning emerges through specific types of perspective transformation (revelatory, integrative, generative, and recursive) and providing empirical evidence for perspective-dependent meaning construction.
5. Exploring applications and implications across domains, including visual literacy, design, contemporary challenges, and ethics.

These contributions collectively establish the anamorphoseverse as a valuable framework for understanding how visual meaning emerges in increasingly dynamic, interactive, and perspective-dependent environments.

By focusing on transformation rather than static properties as the primary locus of meaning-making, this framework offers approaches better suited to the fluid and participatory nature of contemporary visual experience.

The theoretical significance of the Anamorphosisverse framework lies in its capacity to integrate insights from a wide range of disciplines - including mathematics, computer science, phenomenology, and semiotics - into a coherent approach to understanding visual meaning-making.

By positioning perspective transformation as the central mechanism through which meaning emerges, it offers a framework that works with rather than against the increasingly transformational nature of contemporary visual environments.

The practical implications of this framework are equally significant.

For educators, it suggests approaches to visual literacy focused on developing capabilities for perspective navigation rather than fixed interpretive skills.

For designers, it suggests creating systems optimized for productive perspective transformation rather than ideal viewpoints.

For those confronting contemporary challenges, it provides methodologies that facilitate the movement between diverse perspectives, rather than privileging any particular viewpoint

The limitations of this work include the requirement for more comprehensive empirical validation regarding how specific transformations of perspective contribute to particular forms of meaning, as well as the challenge of devising practical methodologies to effectively apply the framework across diverse contexts.

Future research directions include developing more precise mathematical models of the anamorphosisverse, creating empirical methods for mapping perspective transformations in specific visual environments, designing educational approaches based on anamorphic literacy, and establishing ethical frameworks for responsible perspective navigation.

In conclusion, the anamorphosisverse constitutes more than a purely theoretical construct; it embodies a transformative methodology for comprehending the nature of visual experience itself.

By reconceptualizing how meaning emerges through perspective transformation rather than static properties, it offers a framework aligned with the increasingly dynamic, interactive, and perspective-dependent nature of contemporary visual environments.

As these environments continue to evolve through technological and cultural development, the anamorphosis-verse framework provides valuable conceptual tools for navigating the complex landscape of visual meaning-making in the digital age.

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This work represents an evolution of thinking about visual meaning-making in digital environments and builds upon ongoing research into the nature of perspective and transformation in contemporary visual culture.

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Impact of Minimum Wage on Income Distribution for the Period 2012-2018

Paulo Henrique de Paula Wollny & Prof. Dra. Vivian Vicente de Almeida

ABSTRACT

The goal of this monograph is to measure the impact of minimum wage (MW) on income distribution between 2012 and 2018, whether positive or negative, following the steps adopted by Brito (2015) in chapter III, where the author analyzed the impact of MW on income distribution between 1995 and 2011. For this analysis, we performed the standard Blinder Oaxaca decomposition method (mean) and the method proposed by FFL (2009), where we can use the Blinder-Oaxaca decomposition for other statistics besides mean (such as Gini index, percentiles and interquantile differences), based on the microdata of the Continuous National Sample Survey by Domicile (PNAD Contínua) of the years 2012, 2014, 2016 and 2018 conducted by the Brazilian Institute of Geography and Statistics (IBGE), which allows us to analyze the impact of different minimum wage strips on each statistic of our interest for different periods. The decomposition made by these two methodologies allows us to observe the inequality of income caused by the differences in characteristics of the two groups analyzed, in our case, pairs of years (2012-2018, for example). The results of this work show us that the minimum wage generally contributed to reduce inequality between 2012 and 2014, and especially between 2016 and 2018, but between 2014 and 2016, the minimum wage contributed to increase inequality. This contribution to increasing inequality between 2014 and 2016 can be explained by the reduction of income in the lower tail of the distribution plus the increase of income in the upper tail. As for the whole period between 2012 and 2018, both the direct effect of the minimum wage (captured by the strip from 0.9 to 1.1 MW) and the expanded effect (from 0.5 to 1.5 MW), which considers possible spillovers and cash effects, contributed to increasing inequality of income in Brazil..

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RESUMO

O objetivo desta monografia é mensurar o impacto do salário mínimo (SM) na distribuição de renda entre 2012 e 2018, seja ele positivo ou negativo, seguindo os passos adotados por Brito (2015) no capítulo III, onde a autora analisou o impacto do SM na distribuição de renda entre 1995 e 2011. Para tal análise, realizamos o método de decomposição de Oaxaca-Blinder padrão (média) e o método proposto por FFL (2009), onde podemos utilizar a decomposição de Oaxaca-Blinder para outras estatísticas além da média (como índice de Gini, percentis e diferenças interquantílicas), com base nos microdados da Pesquisa Nacional de Amostra por Domicílios Contínua (PNAD Contínua) dos anos 2012, 2014, 2016 e 2018 realizada pelo Instituto Brasileiro de Geografia e Estatística (IBGE), o que nos permite analisar o impacto das diferentes faixas de salário mínimo em cada estatística de nosso interesse para os diferentes períodos. A decomposição feita por estas duas metodologias nos possibilita observar a desigualdade de renda causada pelas diferenças nas características dos dois grupos analisados, no nosso caso, pares de anos (2012-2018, por exemplo). Os resultados deste trabalho nos mostram que o salário mínimo, em geral, contribuiu para reduzir a desigualdade entre 2012 e 2014 e, principalmente entre 2016 e 2018, porém, entre 2014 e 2016, o salário mínimo contribuiu para aumentar a desigualdade. Esta contribuição para aumentar a desigualdade entre 2014 e 2016 pode ser explicada pela redução da renda na cauda inferior da distribuição somada ao aumento da renda na cauda superior. Já para o período completo, ou seja, entre 2012 e 2018, tanto o efeito direto do salário mínimo (captado pela faixa de 0,9 a 1,1 SM) quanto o efeito expandido (de 0,5 a 1,5 SM), que considera possíveis spillovers e efeitos de numerário, contribuíram para aumentar a desigualdade de renda no Brasil.

Palavras-chave: salário mínimo, distribuição de renda, desigualdade, decomposição, Oaxaca Blinder.

ABSTRACT

The goal of this monograph is to measure the impact of minimum wage (MW) on income distribution between 2012 and 2018, whether positive or negative, following the steps adopted by Brito (2015) in chapter III, where the author analyzed the impact of MW on income distribution between 1995 and 2011. For this analysis, we performed the standard Blinder Oaxaca decomposition method (mean) and the method proposed by FFL (2009), where we can use the Blinder-Oaxaca decomposition for other statistics besides mean (such as Gini index, percentiles and interquantile differences), based on the microdata of the Continuous National Sample Survey by Domicile (PNAD Contínua) of the years 2012, 2014, 2016 and 2018 conducted by the Brazilian Institute of Geography and Statistics (IBGE), which allows us to analyze the impact of different minimum wage strips on each statistic of our interest for different periods. The decomposition made by these two methodologies allows us to observe the inequality of income caused by the differences in characteristics of the two groups analyzed, in our case, pairs of years (2012-2018, for example). The results of this work show us that the minimum wage generally contributed to reduce inequality between 2012 and 2014, and especially between 2016 and 2018, but between 2014 and 2016, the minimum wage contributed to increase inequality. This contribution to increasing inequality between 2014 and 2016 can be explained by the reduction

of income in the lower tail of the distribution plus the increase of income in the upper tail. As for the whole period between 2012 and 2018, both the direct effect of the minimum wage (captured by the strip from 0.9 to 1.1 MW) and the expanded effect (from 0.5 to 1.5 MW), which considers possible spillovers and cash effects, contributed to increasing inequality of income in Brazil.

Keywords: minimum wage, income distribution, inequality, decomposition, Blinder-Oaxaca.

I. INTRODUÇÃO E MOTIVAÇÃO

A teoria econômica postula uma relação entre a política de salário mínimo e o nível de desemprego. A primeira relação foca no aumento do primeiro tendo aumento no segundo. Contudo essa relação não é única pois há indícios de uma relação inversa. Um ponto que merece destaque é a utilização do mínimo como atenuante na redução da desigualdade na distribuição de renda.

A desigualdade no Brasil afeta grande parte da população brasileira, tendo mais impacto nas regiões Norte e Nordeste do país, as quais costumam apresentar os piores IDH's (Índice de Desenvolvimento Humano) do Brasil. O Brasil é um país que costuma ter um PIB relativamente alto, porém, ainda é um dos que tem o maior nível de desigualdade no mundo. Segundo um relatório da ONU divulgado em julho de 2010, algumas das principais causas da desigualdade são: a falta de acesso à educação de qualidade; política fiscal injusta; baixos salários; e dificuldade de acesso aos serviços básicos (como saúde, transporte público e saneamento básico). Algumas das consequências da desigualdade no Brasil podem ser observadas pela quantidade de favelas, pobreza, desemprego e violência.

De acordo com o Portal Brasil, o salário mínimo surgiu no Brasil em meados de 1930, mas foi com Getúlio Vargas, em 1951, que o SM passou a ser mais relevante com um decreto que garantia reajustes dos seus valores com maior frequência, os quais, inclusive, afetavam positivamente o seu poder de compra. Com os anos, o SM foi perdendo sua relevância, como podemos ver com a hiperinflação brasileira. Porém, foi com a estabilização dos preços em 1994 (Plano Real) que o salário mínimo teve seu poder de compra recuperado significativamente desde a década de 50.

Além de servir como piso para pensões, aposentadorias e políticas sociais como o Benefício de Prestação Continuada (BPC), as quais são, muitas vezes, as únicas fontes de renda de algumas famílias, o salário mínimo também funciona como um "farol" (por isso o chamado "efeito farol" na literatura) para outras remunerações, isto é, ajuda a determinar a renda em atividades informais e ajuda em negociações salariais entre empregados e empregadores. A respeito da renda, esta é a soma de todos os ganhos financeiros recebidos, como salário, pensão, aposentadoria, entre outros.

Aumentos no mínimo tendem a beneficiar aqueles com remunerações próximas ao SM, portanto, quanto mais pobres forem os beneficiados por tais aumentos, maior deverá ser o impacto desses aumentos sobre a pobreza. Porém, seus efeitos são limitados no combate à pobreza e já existem estudos (como Afonso et al. (2011), por exemplo) que comprovam uma redução da efetividade de aumentos reais do SM para reduzir a pobreza, mas não seu esgotamento. Atualmente, o salário mínimo continua não sendo suficiente para atender as necessidades básicas (como moradia, alimentação, educação, saúde, lazer, roupas, higiene e transporte) de uma família de quatro pessoas. Segundo uma estimativa do Departamento Intersindical de Estatísticas e Estudos Socioeconômicos (DIEESE), em dezembro de 2018, o valor ideal para sustentar uma família de quatro pessoas era de R$3960,57, sendo que o salário mínimo de 2018 era de R$954, ou seja, 4,15 vezes menor que o necessário para o sustento.

A tabela abaixo (tabela 1) traz os valores do salário mínimo real, índice de Gini, percentis 10, 50 e 90 para cada subperíodo, bem como suas variações.

Tabela 1: Salário mínimo real, Índice de Gini e Percentis 10, 50 e 90 – 2012-2018

	2012	2014	2016	2018
SM real (em R$ de 2018)	898,70	933,12	959,49	954,00
Índice de Gini*	0,4748	0,4709	0,4606	0,4699
Percentil 10*	627,04	723,58	687,89	671,86
Percentil 50*	1279,28	1257,99	1390,01	1423,76
Percentil 90*	3847,45	3751,38	4118,14	4154,03
Variação	*2014-2012*	*2016-2014*	*2018-2016*	*2018-2012*
SM real	3,83%	2,83%	-0,57%	6,15%
Índice de Gini	-0,83%	-2,17%	2,01%	-1,03%
Percentil 10	15,40%	-4,93%	-2,33%	7,15%
Percentil 50	-1,66%	10,49%	2,43%	11,29%
Percentil 90	-2,50%	9,78%	0,87%	7,97%

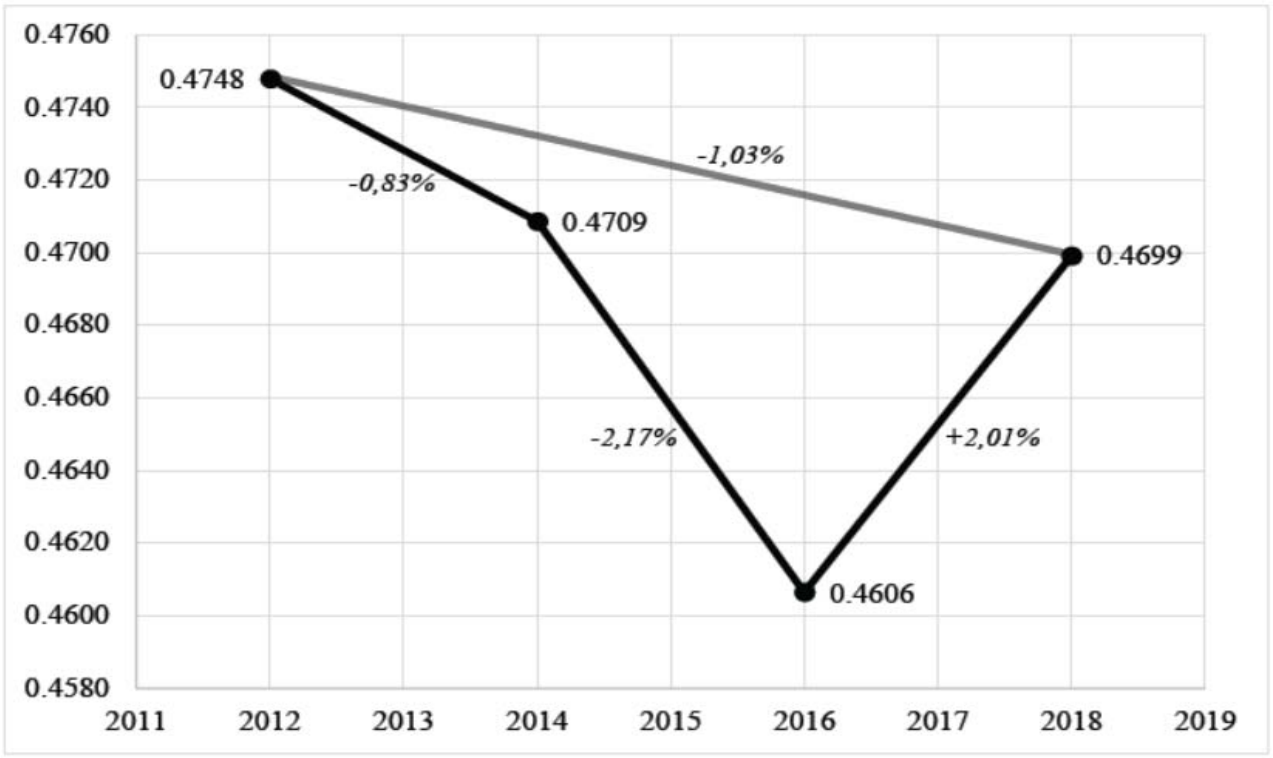
**Para o rendimento do trabalho principal (ocupados com 40 horas por semana) em R$ de 2018.*
Fonte: PNAD Contínua. Elaboração própria.

O salário mínimo real teve um aumento de 6,15% entre 2012 e 2018, passando de R$898,70 para R$954,00.

Analisando apenas a distribuição de rendas no trabalho principal para os ocupados com pelo menos 40 horas semanais de trabalho, vemos que os percentis 10, 50 e 90 aumentaram entre 2012 e 2018 (7,15%, 11,29% e 7,97%, respectivamente). Observamos também, uma redução no índice de Gini entre 2012 e 2018, de 0,4748 para 0,4699, uma diminuição de 1,03% na desigualdade de rendas.

Ao olharmos para os subperíodos, vemos que enquanto o salário mínimo real se valoriza (de 2012 a 2016), o índice de Gini para o rendimento do trabalho principal para os ocupados com pelo menos 40 horas semanais se reduz, e quando o salário mínimo real diminui (2016- 2018), o Gini aumenta. Esta tendência do comportamento entre o SM real e o índice de Gini também foi observada por Brito (2015) entre 1995 e 2011.

O gráfico abaixo (gráfico 1) ilustra o comportamento do índice de Gini para o rendimento do trabalho principal para os ocupados com jornadas de pelo menos 40 horas por semana ao longo do período, trazendo também sua variação em cada subperíodo.



Fonte: PNAD Contínua. Elaboração própria

Gráfico 1: Índice de Gini e sua variação – 2012-2018

Analisando alguns dos resultados mais importantes que encontramos para o período de 2012 a 2018, vemos que o salário mínimo exato teve um efeito concentrador (aumentando a desigualdade) de -86,5% no índice de Gini, onde -134,8% são do efeito composição e 48,3% do estrutura. Entretanto, ao considerarmos um efeito expandido do SM, isto é, considerando também possíveis *spillovers* do salário mínimo e efeitos de numerário, o efeito também seria concentrador em -109,7%, dos quais -139,3% se devem ao efeito composição e 29,6% ao efeito estrutura.

Esta monografia está organizada em 6 seções além desta introdução e motivação. Na primeira seção, apresentamos os nossos objetivos com esta monografia. A segunda seção apresenta uma revisão da literatura, dividida em duas, nacional e internacional, sobre temas relacionados ao nosso (desigualdade e salário mínimo). A terceira seção explica a base de dados e a metodologia utilizada para mensurar o impacto do salário mínimo na distribuição de rendas do trabalho principal. A quarta seção traz as estatísticas descritivas das variáveis que foram utilizadas nas decomposições, para captar as mudanças ocorridas na força de trabalho entre 2012 e 2018. A quinta seção apresenta os resultados das decomposições feitas, evidenciando os efeitos composição (parte explicada pelas características dos grupos observados) e estrutura (parte não explicada, ou seja, diferenças na reação às características entre os grupos) na distribuição de rendas do trabalho. Assim como Brito (2015), analisamos a média, o índice de Gini, os percentis 10, 50 e 90 e as diferenças inter quantílicas 90-10 e 50-10 para o efeito composição, já para o efeito estrutura, analisamos apenas o índice de Gini, visto que os resultados não são tão óbvios e apresentam uma certa dificuldade para interpretações. Por último, trazemos a conclusão.

II. OBJETIVOS

Esta monografia tem dois objetivos, o primeiro é tentar servir de "continuação" para o capítulo III de Brito (2015), no qual a metodologia que a autora utilizou foi a decomposição de Oaxaca-Blinder (a qual capta as diferenças médias no logaritmo dos salários entre grupos, dividindo

o diferencial em duas partes, a explicada (efeito composição) e a não explicada (efeito estrutura) por fatores que costumam definir os salários) com dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) para identificar o impacto do salário mínimo na queda da desigualdade de salários no Brasil para o período de 1995 a 2011, dividindo em quatro subperíodos, cada um representando um governo, os quais foram: 1995 a 1998 (primeiro FHC), 1998 a 2002 (segundo FHC), 2002 a 2006 (primeiro Lula) e 2006 a 2011 (segundo Lula). Este primeiro objetivo, consequentemente nos leva ao segundo: utilizar a mesma metodologia que a autora (decomposição de Oaxaca-Blinder para a média, índice de Gini, percentis 10, 50 e 90 e diferenças inter quantílicas 90-10 e 50-10) com dados da PNAD Contínua para identificar o impacto do salário mínimo na distribuição de renda no Brasil para o período de 2012 a 2018, dividindo em três subperíodos: 2012 a 2014, 2014 a 2016 e 2016 a 2018.

III. REVISÃO DA LITERATURA

É quase um consenso na literatura a relevância do salário mínimo na desigualdade de rendimentos do trabalho, seja aumentando ou reduzindo. Além de também poder ser usado como piso para políticas sociais (como a previdência e o Benefício de Prestação Continuada (BPC) no Brasil) o que, segundo Brito (2015), comprovam o papel do salário mínimo na redução da desigualdade. Porém, existem outros fatores que podem contribuir para a desigualdade, positivamente ou negativamente (como diferenças salariais de acordo com o grau educacional, raça e sexo).

Para analisar os principais estudos relativos à desigualdade de renda e ao efeito do salário mínimo, esta revisão de literatura está dividida em duas seções. Na seção 3.1 há um resumo dos principais estudos relativos à desigualdade de renda e ao efeito do sálario mínimo na literatura internacional. Já a seção 3.2 refere-se aos principais estudos sobre os assuntos em questão na literatura nacional.

3.1. Literatura Internacional

Card e Krueger (1994), para avaliar o impacto da lei de aumento do salário mínimo em Nova Jersey, 1992, na qual o mínimo passou de US$4,25 para US$5,05 por hora, entrevistaram 410 restaurantes de *fast-food* em *New Jersey* e no leste da *Pennsylvania* antes e depois do aumento. Após realizarem comparações no crescimento do emprego nas lojas de *New Jersey* e *Pennsylvania* e compararem as mudanças de emprego nas lojas de *New Jersey* que inicialmente pagavam salários acima de US$5,00 com as mudanças nas lojas de salários mais baixos, não encontraram impressões de que o aumento no salario mínimo reduzisse o emprego.

Neumark, Schweitzer e Wascher (2000), com o objetivo de aprimorar o corpo de pesquisa existente, fornecem evidências de um vasto conjunto de margens ao longo das quais os mercados de trabalho podem se ajustar em reação a aumentos no salário mínimo. As evidências indicam que aqueles trabalhadores que inicialmente ganhavam próximo do mínimo são afetados negativamente pelo aumento do mínimo, enquanto aqueles com salários mais altos são afetados em baixa escala (como já era de se esperar). Além disso, também adentraram a política econômica do salário mínimo, a fim de entender o forte apoio dos sindicatos à aumentos do mínimo. Utilizando a mesma estrutura empírica, descobriram que, quando o mínimo aumentava, os trabalhadores sindicalizados de salários relativamente baixos ganhavam às custas dos não sindicalizados de salários menores.

Fields e Kanbur (2005), a fim de contribuírem com a teoria básica do salário mínimo, de que, em um mercado de trabalho competitivo, a introdução de um mínimo acima do salário de equilíbrio competitivo causará desemprego, fizeram duas análises. Primeiro, analisaram os efeitos de um mínimo alto em termos de pobreza ao invés de desemprego. Segundo, estenderam o modelo básico da literatura para permitir a transferência de renda entre os empregados e desempregados. Com isso, constataram que há situações em que um mínimo mais alto aumenta a pobreza, outras onde reduz a pobreza e outras onde a pobreza

permanece inalterada. Por fim, concluíram que mudar a perspectiva de desemprego para pobreza leva a um grande enriquecimento da teoria do salário mínimo.

Lemieux (2007), para descobrir o porque do crescimento da desigualdade ter sido mais centralizado na cauda superior da distribuição salarial nos últimos 15 anos, analisou os desenvolvimentos recentes na literatura sobre desigualdade salarial. Muitas são as causas discutidas para o crescimento da desigualdade salarial, não só nos Estados Unidos mas em outros países desenvolvidos também. Concluiu que são três as explicações mais promitentes para tal crescimento da desigualdade salarial: a dessindicalização, o constante aumento da remuneração por performance e as mudanças na demanda relativa pelos tipos de atividades realizadas pelos trabalhadores em ocupações com altos salários.

Stewart (2011), procurando investigar possíveis efeitos de *spillover* no salário mínimo do Reino Unido (visto que a desigualdade na metade inferior da distribuição de salários parou de crescer desde meados dos anos 90 e que a desigualdade na metade superior continua crescendo, sugerindo a existência de efeitos do mínimo e efeitos de *spillover* em salários acima do mínimo), analisou as variações salariais individuais usando um estimador de *diff-in-diff* e uma especificação que envolve comparações de *cross-uprating*, concluindo que não houve *spillovers* do mínimo. Como o mínimo no Reino Unido sempre esteve abaixo do 10º percentil, essa falta de *spillovers* indica que as mudanças do mínimo não afetaram a medida de desigualdade na razão 50:10 (valor do 50º percentil sobre o valor do 10º percentil) na metade inferior da distribuição salarial.

Pelek (2013) investigou o efeito do salário mínimo na distribuição salarial, mais especificamente a desigualdade de salário na Turquia, decompondo as diferenças salariais e as mudanças na desigualdade salarial antes e após o forte aumento do salário mínimo em 2004. Utilizou uma abordagem não paramétrica de reponderação para decompor os efeitos do aumento do salário mínimo, assim como outros elementos que podem ter tido efeito na distribuição salarial. Seus principais resultados comprovaram que o salário mínimo teve um papel primordial para a queda da desigualdade salarial entre homens e mulheres entre 2003 e 2005 na Turquia.

Autor, Manning, e Smith (2016), para reavaliarem os efeitos do salário mínimo na desigualdade de renda nos EUA, usaram dados de décadas adicionais e uma estratégia de *IV* (Variáveis Instrumentais) que levanta possíveis vieses em trabalhos anteriores. Descobriram que o salário mínimo reduz a desigualdade na cauda inferior da distribuição de salários, ainda que seja consideravelmente menor que estimativas anteriores, sugerindo que o aumento da desigualdade na cauda inferior após 1980 reflete essencialmente as mudanças subjacentes na estrutura dos salários, ao invés de uma revelação da desigualdade latente. Esses efeitos salariais se estendem a percentis onde o mínimo não é nominalmente vinculativo, resultando em *spillovers*.

Karakitsios e Matsaganis (2018), com o conhecimento de que o salário mínimo é considerado uma ferramenta redistributiva, apesar de existirem duvidas a respeito de sua eficiência devido ao potencial efeito negativo no emprego (desemprego), procuraram estudar a capacidade redistributiva do salário mínimo por meio de técnicas de micro simulação e sob diversos cenários de elasticidade do emprego. Obtiveram resultados que indicam a possibilidade de um efeito do salário mínimo de redução da pobreza mesmo na presença de um efeito de desemprego. Contudo, esse efeito do salário mínimo é limitado, pois a elasticidade do emprego é mais negativa. Do mesmo modo, quando se aumenta o salário mínimo, a desigualdade diminui, mas o efeito redistributivo é mais fraco quando causa desemprego. Tendo conhecimento disso, as políticas de salário mínimo devem ser usadas cautelosamente e sempre levando em consideração qualquer impacto possível no emprego.

3.2. Literatura Nacional

Hoffmann (1998), a fim de estudar a desigualdade e pobreza no Brasil para o período de 1979/97 e a influência da inflação e do salário mínimo (SM), utilizou dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) para analisar a distribuição de renda entre famílias e entre pessoas economicamente ativas no Brasil, evidenciando a evolução de algumas medidas de desigualdade e pobreza para o período estudado. Constatou-se que as variações no grau de pobreza têm relação com as variações na renda média e na desigualdade, além disso, o resultado mostra que a desigualdade da distribuição de renda aumenta com a inflação e tem uma relação negativa com o valor real do SM.

Ramos e Vieira (2001) contribuíram para a concepção de iniciativas de políticas públicas destinadas a diminuir as desigualdades (visto que a demanda por estas era crescente), através de dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) para os anos 80 e 90 e identificaram os principais determinantes da assimetria da estrutura de rendimentos no mercado de trabalho. O resultado principal mostra que a heterogeneidade educacional junto com os diferenciais de remuneração relacionados à escolaridade são os grandes responsáveis tanto para explicar a desigualdade de rendimentos quanto o seu crescimento no período analisado (décadas de 80 e 90).

Soares (2002) estimou o impacto de mudanças no valor do salário mínimo (SM) sobre a distribuição dos rendimentos individuais do trabalho utilizando duas abordagens complementares. A primeira foi o uso de estimadores não-paramétricos (Kernel), com largura de banda de 0,08 e dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) após o Plano Real. Os resultados desta primeira abordagem mostram que aproximadamente 10% dos ocupados ganham valores próximos do SM e, apesar de inferior aos 15% que ganham menos que um SM, os gráficos sugerem que há um efeito significativo sobre a distribuição dos rendimentos. A segunda abordagem foi usar uma série de grupos de comparação para estimar a elasticidade dos rendimentos de cada centésimo de renda com relação a aumentos no SM, usando dados das Pesquisas Mensais de Emprego (PMEs) após o Plano Real. Apesar das metodologias usadas serem imperfeitas, todas chegaram a resultados parecidos: a elasticidade da renda com relação ao SM seria pequena (aprox. 0,2) para os centésimos inferiores da distribuição de renda, maior (aprox. 0,6) para os centésimos onde as pessoas ganham o SM antes do aumento e, por fim, reduz para zero para os dois quintos superiores da distribuição de renda. O resultado final é que apesar de o SM ter efeito redistributivo, este não é grande.

Ulyssea e Foguel (2006) fizeram uma revisão da literatura referente aos impactos do salário mínimo (SM) sobre o mercado de trabalho brasileiro, evidenciando trabalhos produzidos posteriormente e, além disso, ampliaram e atualizaram esses trabalhos. Os autores focaram em dois temas principais: o impacto do SM sobre a distribuição dos salários; e o impacto do SM sobre as variáveis de emprego. Partindo dos resultados dos trabalhados explorados, foi possível reproduzir algumas observações gerais a respeito dos efeitos do SM sobre o mercado de trabalho brasileiro: *a*) há uma conformidade de que o SM tem efeito na redução da desigualdade na distribuição de salários; *b*) o SM aparenta ter efeito negativo, porém em menor escala, sobre o emprego; *c*) os impactos negativos parecem ocorrer mais vigorosamente sobre o setor informal, mesmo sendo de pequena intensidade; e *d*) evidências anteriores indicam que o SM tem efeito expressivo sobre a probabilidade de se mudar do emprego formal para o informal.

Saboia (2007), testou a contribuição do salário mínimo para a melhoria da distribuição de renda utilizando dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) do período 1995-2005. A partir da PNAD, foram usados dados de rendimentos do trabalho, pensões e aposentadorias oficias, além do Benefício de Prestação Continuada (BPC), representando quase todos os rendimentos observados pela PNAD, onde o SM possui grande influência. A partir de um conjunto de simulações para a distribuição de renda, chegou-se a um resultado que confirma a importância do SM na diminuição das

desigualdades de rendimentos no período, atribuindo 64% da melhoria no período ao crescimento do SM.

Menezes-Filho e Rodrigues (2009), para analisarem o efeito do salário mínimo na distribuição salarial do Brasil entre 1981 e 1999, utilizaram uma abordagem semiparamétrica. Verificaram os efeitos de outros três fatores além do salario mínimo, com o objetivo de comparar a importância de cada um na evolução da desigualdade brasileira. Para obter os efeitos de cada um dos fatores, foram utilizados dados da Pesquisa Nacional de Amostra por Domicílios (PNAD) e um estimador não paramétrico (Kernel) da densidade dos salários com pesos apropriados, a fim de conseguir uma representação visual clara do impacto de cada um dos fatores. Os resultados indicam que o salário mínimo tem efeitos importantes sobre a desigualdade brasileira.

Cunha e Vasconcellos (2012), com o objetivo de investigar a evolução da desigualdade na distribuição dos salários no mercado de trabalho brasileiro, realizaram uma decomposição dessa desigualdade, a qual indicou que a heterogeneidade educacional explica boa parte da desigualdade total. A queda da desigualdade na distribuição dos salários pode ser explicada principalmente pela redução dos diferenciais de salários entre os níveis educacionais. Sob outra perspectiva, o aumento da desigualdade salarial no país tem sido contribuído pela ampliação do mercado de trabalho formal. Por último, mesmo verificando-se queda na dispersão dos salários entre os fatores observados, evidências indicam aumento na parcela atribuída aos fatores não observados. Medeiros et al. (2014) estudaram o nível e a evolução da desigualdade de renda entre adultos brasileiros para o período de 2006 a 2012 combinando dados tributários da Declaração Anual de Ajuste do Imposto de Renda da Pessoa Física (DIRPF) e da Pesquisa Nacional por Amostra de Domicílios (PNAD) para construir uma distribuição completa da renda total entre adultos, aplicaram interpolações de Pareto para chegar à distribuição dentro dos estratos, testaram e compararam os resultados à PNAD, à Pesquisa de Orçamentos Familiares (POF) e aos dados do Questionário da Amostra do Censo (Censo). Chegando a um resultado de que a desigualdade de renda no Brasil, além de ser mais alta do que se esperava, permaneceu estável entre 2006 e 2012. Por fim, apesar de ter havido crescimento da renda no período, os mais ricos absorveram a maior parte desse.

Brito (2015) procurou, usando a decomposição de Oaxaca-Blinder, analisar o papel distributivo do salário mínimo como piso de aposentadorias e pensões no papel distributivo da renda. Seus resultados indicam o efeito direto da política de salário mínimo caracterizado pela faixa de 0,9 a 1,1, desconcentrador em 22,1%. Outro resultado relevante foi o efeito expandido do salário mínimo, na faixa de 0,5 a 1,5, de possíveis vazamentos da política de piso salarial e efeitos de numerário. Por último, analisando a desigualdade de rendimento domiciliar *per capita* entre 1995 e 2013, chegou-se a um efeito global do salário mínimo em média de 72,4% com destaque para previdência, mercado de trabalho e o Benefício de Prestação Continuada (BPC).

Saboia e Hallak Neto (2018) procuraram estimar os efeitos da atual política de reajuste do salário mínimo (SM) na melhoria da distribuição de renda por meio do cálculo das elasticidades dos rendimentos em relação ao SM, visto que este vem sofrendo um forte processo de crescimento no Brasil há vários anos. Através das simulações realizadas, Saboia e Neto chegaram a um resultado de que o SM foi um grande contribuinte nos últimos anos, contribuindo tanto pelo mercado de trabalho quanto através das pensões, aposentadorias e outras transferências oficiais.

IV. METODOLOGIA

4.1. Base de dados

Como dito na seção dos objetivos, utilizaremos a decomposição de Oaxaca-Blinder. Para fazermos tais decomposições utilizaremos os microdados da Pesquisa Nacional de Amostra por Domicílios Contínua (PNAD Contínua) para os anos de 2012, 2014, 2016 e 2018.

Decidimos utilizar a PNAD Contínua pois a PNAD foi descontinuada e por ser a pesquisa com a

maior amplitude geográfica disponível no país, visto que leva em conta o Brasil inteiro, além de considerar os setores formal e informal. E ainda, de acordo com o IBGE, a pesquisa é feita anualmente, considerando características gerais da população, como educação, trabalho e rendas.

A escolha dos períodos a serem analisados se baseou não só no "complementar" de Brito (2015), mas também no fato de que a PNAD Contínua começa sua série em 2012, o que a torna uma base relativamente nova. Além disso, a divisão dos subperíodos (2012-2014, 2014-2016, 2016-2018) também advém das mudanças de políticas entre o período completo, isto é, governos Dilma e Temer.

A amostra utilizada é composta por ocupados maiores de 14 anos com jornadas de trabalho de pelo menos 40 horas semanais (média de 8 horas por dia). Para cada ano, a amostra possui, em média, 124 mil observações.

4.2. Método

Utilizaremos a decomposição de Oaxaca-Blinder (Blinder 1973; Oaxaca, 1973), a qual é comumente utilizada para estudar diferenciais de salários entre grupos no mercado de trabalho, onde uma parte refere-se à diferentes características entre grupos (como educação e idade) e a outra parte refere-se às diferenças entre os grupos (não explicadas), como discriminação, por exemplo.

Para exemplificar, suporemos uma análise do diferencial salarial entre homens e mulheres. Neste caso, temos que !" é o logaritmo do salário e s é o sexo. Desta forma, o salário seria determinado por:

$$W_s = X_S\beta_S + \varepsilon_s \, , E(\varepsilon_S | X_s) = 0 \text{ e } s \, \epsilon \, (H, M) \quad (1)$$

Em que X_s é a matriz de características pessoais do indivíduo (fatores observáveis), β_s é a matriz de coeficientes das características e ε_s é o conjunto de fatores aleatórios (não observáveis). H refere-se aos homens e M às mulheres.

Na decomposição de Oaxaca-Blinder, podemos escrever a diferença média dos salários entre homens e mulheres da seguinte forma:

$$E(W_H) - E(W_M) = [E(X_H) - E(X_M)]\hat{\beta}_H + (\hat{\beta}_H + \hat{\beta}_M)E(X_M) \quad (2)$$

Onde) *E(W)* é o valor esperado (média) das variáveis explicativas de cada grupo.

Substituindo) *E(W)* eE (X) por *W e x* respectivamente, podemos simplificar a equação (2) da seguinte forma:

$$\bar{W}_H - \bar{W}_M = (\bar{X}_H - \bar{X}_M)\hat{\beta}_H + (\hat{\beta}_H - \hat{\beta}_M)\bar{X}_M \quad (3)$$

Desta forma, podemos decompor o diferencial médio dos rendimentos entre os dois grupos em duas partes, uma explicada pelas características (efeito composição) e outra referente a diferenças na retribuição às características entre os grupos (efeito estrutura).

Como dito anteriormente, utilizaremos a decomposição de Oaxaca-Blinder para decompor as diferenças médias do logaritmo da renda do trabalho principal em uma parte explicada pela formação dos grupos, que, assim como em Brito (2015), serão os anos, e outra parte (a não explicada) referente ao efeito estrutura. Além disso, como estamos tentando continuar com o trabalho feito pela autora, também realizaremos a decomposição para o índice de Gini, percentis 10, 50 e 90 e diferenças inter quantílicas 90-10 e 50-10.

Para decompor o índice de Gini e os percentis, faremos como Brito (2015) e usaremos o método sugerido por FFL (2009), que serve para outras medidas além da média. Tal método utiliza a função influência recentrada (RIF) da estatística de interesse (no nosso caso, Gini, percentis e diferenças inter quantílicas) como variável dependente.

Seguindo a metodologia adotada por Brito (2015), temos a função influência (IF) que reflete a influência de uma observação individual sobre a estatística de interesse. Usando y como a variável de análise, v como a estatística de interesse de y e F como a função distribuição acumulada de y,

assim como Brito (2015) fez, temos que:

$$<= (>: @, =) = \lim_{D \to F}(@(=_D) - @(=)) \,|0 \text{ ,onde } =_D(>) = (1 - 0) = +\, 0H_I \text{ , } 0 \le 0 \le 1 \text{ e } H_D \qquad (4)^1$$

é a medida de probabilidade que coloca a massa 1 no valor y.

A versão recentrada da função influência RIF *(y;v)* é obtida pela soma entre a estatística de interesse e a influência IF:

$$RIF(y; v) = v(F) + IF(y; v) \qquad (5)^2$$

Assim como Brito (2015), estamos focando nas diferenças entre dois períodos, o ano A e o ano B, por exemplo. Portanto, fazendo como FFL (2011), para um indivíduo *i*, consideremos a renda que seria obtida no ano A (Y_{oi}) e no ano B (Y_{1i}). Para cada indivíduo i constatamos o salário $Y_i = Y_{oi}(1 - T_i) + Y_{1i}T_i$, *onde* $T_i = 1$ se o indivíduo é observado no ano B e $T_i = 0$ se o indivíduo é observado no ano A.

Se $\Delta\frac{v}{0}$ é a diferença total entre A e B da estatística de interesse v (variância como exemplo), ao subtrairmos e somarmos o termo contrafactual *v(FY1 t=0)* (variância ao ter características *X* do ano A e retornos β & do ano B), do mesmo modo que Brito (2015) fez, teremos que:

$$\Delta_0^v = v\left(F_{Y_0|T=0}\right) - v\left(F_{Y_1|T=0}\right) + v\left(F_{Y_1|T=0}\right) - v\left(F_{Y_1|T=1}\right) \qquad (6)$$

Onde $\Delta_S^v = v\left(F_{Y_0|T=0}\right) - v\left(F_{Y_1|T=0}\right)$ efeito estrutura (diferença no retorno)

$\Delta_X^v = v\left(F_{Y_1|T=0}\right) - v\left(F_{Y_1|T=1}\right)$ X é o efeito composição (diferença em características).

Segundo Brito (2015), encontrar $v\left(F_{Y_1|T=0}\right)$ pode ser um problema, ou seja, a estatística de interesse contrafactual dos indivíduos observados no ano A que estariam com retornos do ano B. Ainda segundo a autora, a metodologia proposta por FFL estima este termo não parametricamente, "[...] e permite a separação de diferentes covariadas no efeito total, estrutura e composição para qualquer estatística de interesse ao usar uma regressão quantílica incondicional da função influência recentrada de Y sobre as variáveis explicativas X." (BRITO, 2015, p. 55).

Conforme destacado por Brito (2015), este método é vantajoso pois nos permite decompor para quaisquer que sejam as estatísticas de interesse, diferente da Oaxaca-Blinder padrão, que só nos permite decompor para a média, e também nos permite identificar ambos os efeitos composição e estrutura para cada covariada, independente de como foram ordenadas, isto é, sua ordem não tem impacto no resultado final da decomposição.

4.3. Variáveis do modelo

Neste trabalho, analisaremos o rendimento mensal do trabalho principal. Além disso, o SM ainda tem um efeito numerário na essência de que os trabalhadores podem receber múltiplos de seu valor como remuneração mensal.

Para captar tanto o efeito numerário quanto *spillovers* (vazamentos do efeito de reajuste do piso para remunerações em torno dele), fizemos como Brito (2015) e criamos faixas de SM para o rendimento. Assim, a matriz *SM* na equação 7 agrega as *dummies* de salário mínimo: menos de 0,5 SM, de 0,5 a 0,9 SM, de 0,9 a 1,1 SM (faixa do SM exato), de 1,1 a 1,5 SM, de 1,5 a 2 SM e mais de 2 SM. Serão considerados, além de numerário (0,5 SM e 1,5 SM), *spillovers* os vazamentos para as faixas 0,5 a 0,9 e 1,1 a 1,5 SM. Em vista disso, um efeito expandido do SM seria captado através do intervalo de 0,5 a 1,5 SM.

[1] Equação retirada da página 55 do capítulo III de Brito (2015).
[2] Equações retiradas da página 55 do capítulo III de Brito (2015).

Tabela 2: Valores correspondentes a cada faixa de salário mínimo* – 2012- 2018

Faixa de salário mínimo	2012	2014	2016	2018
0,5 SM	449	467	480	477
0,9 SM	809	840	864	859
1 SM	899	933	959	954
1,1 SM	989	1026	1055	1049
1,5 SM	1348	1400	1439	1431
2 SM	1797	1866	1919	1908

**Em R$ de 2018. Elaboração própria.*

As covariadas restantes incluídas nas regressões expressam o que é geralmente usado para explicar as variações da renda do trabalho: a matriz X abrange as características individuais (idade, idade ao quadrado, educação, região de moradia, condição na família, sexo, cor) e a matriz W, as características da inserção no mercado de trabalho (formalidade do trabalho, setor de atividade).

$$\ln Y_i = \beta_0 + \beta_1 SM_i + \beta_2 X_i + \beta_3 W_i + \varepsilon_i \quad (7)^3$$

onde $ln\ Y_i$ é o logaritmo neperiano do rendimento do trabalho principal do indivíduo i, β_o é a constante do modelo, β_1 é o coeficiente associado à matriz SM, β_2 é o coeficiente relacionado à matriz X, β_3 é o coeficiente da matriz W e ε_i é o termo de erro estocástico.

Para captar o impacto da raça, criamos uma *dummy* de "não branco", que inclui os ocupados negros, pardos ou indígenas. Para obtermos um efeito não homogêneo de cada ano a mais de escolaridade, fizemos como Brito (2015) e formamos faixas de anos de estudo: menos de 1 ano, de 1 a 3 anos, de 4 a 7, de 8 a 10 e 11 e mais.

Consideramos formais os empregados com carteira, inclusive domésticos, os trabalhadores por conta própria e empregadores que contribuíram com a Previdência e os funcionários públicos e militares.

Usamos a variável setor de atividade que engloba os seguintes setores: Agricultura, Indústria Geral, Informação, comunicação e atividades financeiras, Construção, Comercio e reparação, Alojamento e alimentação, Transporte, armazenagem e correio, Administração publica, defesa e seguridade social, Educação, saúde e serviços sociais, Serviços domésticos, Outros serviços e Atividades mal definidas.

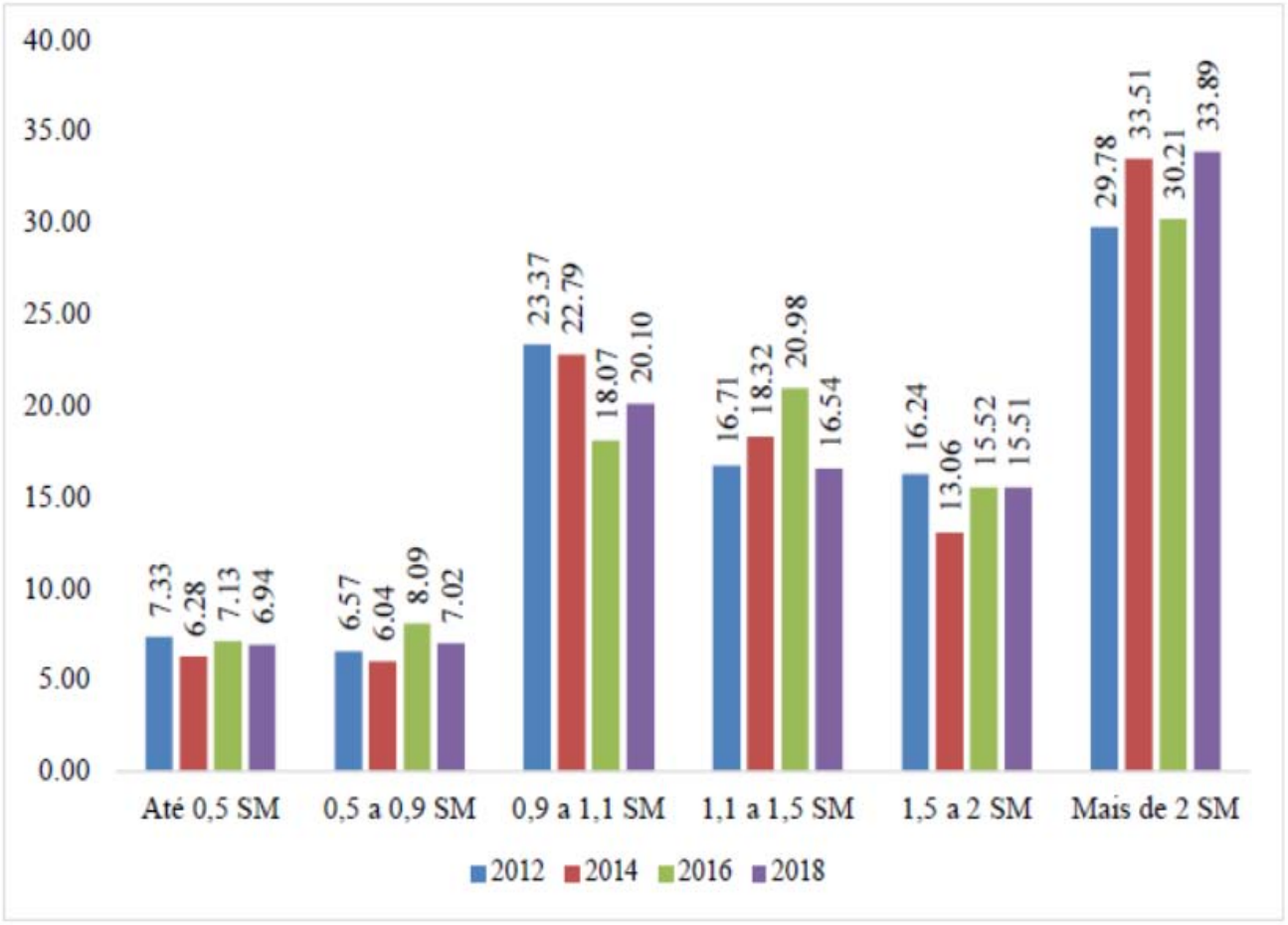
Para observar o efeito de experiência usamos as variáveis idade e idade ao quadrado. Criamos as *dummies* chefe da família e mulher, além de *dummies* para as cinco regiões geográficas do Brasil. As variáveis omitidas nas regressões nos casos de variáveis categóricas foram: não chefe, homem, branco, menos de 1 ano de estudo, informal, setor Agrícola e região Sul, assim como Brito (2015) fez.

V. ESTATÍSTICAS DESCRITIVAS

Nesta seção mostraremos o comportamento das variáveis que serão utilizadas nas decomposições e que representam as mudanças de composição ocorridas entre 2012 e 2018.

O gráfico abaixo ilustra a distribuição dos ocupados maiores de 14 anos e com jornada de 40 horas semanais ou mais por faixa de SM. Podemos observar uma redução do peso de trabalhadores ganhando uma remuneração próxima ao salário mínimo (0,9 a 1,5 SM) e o aumento do peso dos trabalhadores que recebem acima de 2 SM no período. Apesar do piso salarial ter aumentado em termos reais de 2012 para 2018 (aumento real de 6,15%), mais pessoas passaram a ganhar acima do de 2 SM, reduzindo a faixa em torno do SM. Para comparação, trazemos o gráfico feito por Brito (2015) para o período 1995-2011 no anexo (Figura 1A).

[3] Equação retirada da página 57 do capítulo III de Brito (2015).



Fonte: PNAD Contínua. Elaboração própria.

Gráfico 2: Distribuição dos ocupados por faixa de SM (%) – 2012-2018

Entre 2012 e 2018, o número de ocupados passou de 89,7 milhões para 91,8 milhões, aumento de apenas 2,34%. A primeira faixa de remuneração não foi consideravelmente afetada pela valorização do salário mínimo (com exceção de 2014, com redução de 1,05 pontos percentuais), visto que seu peso passou de 7,33% para 6,94% no período todo.

Analisando os subperíodos na tabela 1A do Anexo deste capítulo, podemos ver que a faixa de 1 SM (0,9 a 1,1 SM) diminuiu de peso principalmente entre 2014 e 2016 (4,7 pontos percentuais) e teve um aumento de 2016 para 2018 (2 p.p.), períodos em que o SM teve uma valorização seguido por uma desvalorização (2,8% e 0,6%, respectivamente). A faixa seguinte (1,1 a 1,5 SM) teve um aumento entre 2014 e 2016 (2,7 p.p.), seguido por uma queda entre 2016 e 2018 (4,4 p.p.). Já a faixa com os ocupados que recebem mais de 2 SM teve um aumento entre 2012 e 2014 (3,7 p.p.), seguido por uma queda entre 2014 e 2016 (3,3 p.p.) e um segundo aumento entre 2016 e 2018 (3,7 p.p.), ficando quase no mesmo patamar de 2014. Isto pode indicar que aqueles que ganhavam na faixa do SM tiveram reajustes da mesma intensidade que a valorização real do SM, fazendo com que estes trabalhadores subissem para faixas maiores (mais de 2 SM).

A tabela abaixo apresenta as estatísticas descritivas da amostra em cada ano, conforme remuneração média, idade, escolaridade, região, condição na família, sexo, cor, *status* de formalidade e setor de atividade. O número de ocupados na amostra e o desvio padrão se encontram na tabela 2A do Anexo.

Tabela 3: Estatísticas descritivas dos trabalhadores ocupados – 2012, 2014, 2016 e 2018

Variáveis	Ano			
	2012	2014	2016	2018
Remuneracão média (R$ de 2018)	2019,30	2134,88	2081,12	2185,23
Idade média (anos)	37,4	38,1	39,3	39,7
Escolaridade (%)				
Menos de 1 ano	3,9	3,6	3,5	2,6
De 1 a 3 anos	6,2	5,8	5,3	3,9
De 4 a 7	21,6	20,4	18,9	18,7
De 8 a 10	18,1	17,9	16,3	15,2
11 e mais	50,2	52,3	56,1	59,6
Região (%)				
CO	11,5	11,6	11,4	11,9
NE	25,4	26,1	25,5	24,6
Norte	11,9	12,3	12,3	12,4
SE	30,6	29,8	30,2	30,4
Sul	20,6	20,2	20,6	20,7
Dummies (%)				
Chefe da família	51,1	51,3	52,1	50,1
Mulher	33,6	33,9	35,0	35,6
Não branco	53,8	54,7	55,6	56,8
Formal	82,8	84,1	84,6	83,5
Setor de Atividade (%)				
Agricultura	13,9	13,5	13,8	13,3
Indústria geral	15,4	15,2	13,3	13,0
Informação, comunicação e atividades financeiras	9,1	9,5	9,0	9,8
Construção	10,1	10,0	9,0	7,7
Comércio e reparação	21,0	20,8	20,8	20,8
Alojamento e alimentação	4,1	4,3	4,9	5,4
Transporte, armazenagem e correio	5,0	5,0	5,3	5,4
Administração pública, defesa e seguridade social	6,2	6,3	6,0	6,0
Educação, saúde e serviços sociais	6,6	7,3	9,2	9,6
Serviços domésticos	5,2	4,7	5,2	5,0
Outros serviços	3,3	3,4	3,6	3,9
Atividades mal definidas	0,1	0,0	0,0	0,1

Fonte: PNAD Contínua. Elaboração própria.

Entre 2012 e 2018, a idade média dos ocupados aumentou 2,3 anos, passando de 37,4 para 39,7. O período de maior aumento foi entre 2014 e 2016 (aumento de 1,2 ano).

Podemos observar uma mudança no perfil educacional no mercado de trabalho. O peso da baixa escolaridade diminuiu em todas as faixas, principalmente na faixa de 4 a 7 anos (fundamental incompleto), com uma redução de 21,6% para 18,9% (-2,9 pontos percentuais) entre o período de 2012 a 2018. Já o peso dos que tem pelo menos o ensino médio completo (11 anos e mais) aumentou de 50,2% para 59,6% (9,4 p.p.) entre o período, atingindo mais de metade dos ocupados. O subperíodo de maior aumento do peso desta faixa foi entre 2014 e 2016, com aumento de 3,8 p.p. (Tabela 1A).

A respeito da distribuição regional dos ocupados, não houve mudanças significativas no período.

A maioria dos ocupados continua sendo de chefes de família, com uma pequena mudança entre o período de 2012 e 2018 (redução de 1 p.p.). Houve um aumento na proporção de mulheres entre os ocupados (de 33,6% para 35,6%) no período.

No caso da cor de pele, o peso de não brancos nos ocupados aumentou de 53,8% em 2012 para 56,8% em 2018, aproximadamente 1% a cada subperíodo.

Enquanto o número de ocupados cresceu 2,1 milhões de 2012 para 2018, a proporção de trabalhadores formais passou de 82,8% para 83,5%, aumento de apenas 0,7 pontos percentuais, tendo um aumento de 1,8 p.p. entre 2012 e 2016, mas caindo 1,1 p.p. de 2016 para 2018.

Na distribuição de ocupados por setor de atividade, podemos destacar a redução do peso da indústria geral (2,4 p.p.) e o aumento do peso da educação, saúde e serviços sociais (3 p.p.) e do alojamento e alimentação (1,3 p.p.) no período 2012-2018. Ao mesmo tempo em que a indústria geral perdeu peso em todos os subperíodos, o setor de educação, saúde e serviços sociais aumentou de peso, tendo seu maior aumento no subperíodo de 2014-2016 (1,9 p.p.). Em contra partida, foi no subperíodo de 2016 e 2018 que a agricultura mais perdeu espaço entre os ocupados (0,5 p.p.).

Por último, o rendimento médio evoluiu mantendo um valor duas vezes maior que o salário mínimo no período. Enquanto o salario mínimo aumentou 6,2% em termos reais no período de 2012-2018, o rendimento médio aumentou 8,2% no mesmo período. De 2012 para 2014, o rendimento médio aumentou 5,7%, de R$2.019,30 para R$2.134,88. Até 2014, o rendimento médio cresceu junto com o salário mínimo real, porém, em 2016, o rendimento médio foi menor do que em 2014, mesmo com o salario mínimo sendo maior, chegando ao valor de R$2.081,12 (redução de 2,5%). Em 2018, com uma pequena redução do valor real do salario mínimo, o rendimento médio voltou a crescer, chegando a R$2.185,23 (aumento de 5%). Este impacto no rendimento médio pode indicar reajustes inferiores dos demais rendimentos do mercado de trabalho em relação aos do piso salarial.

Desse modo, paralelo à valorização do salário mínimo, houve diversas mudanças, mesmo algumas sendo pequenas, na composição do mercado de trabalho brasileiro entre 2012 e 2018. Aumentou a ocupação e a formalização do trabalho, melhorou o grau de educação dos ocupados, aumentou a participação da mulher e do não branco no mercado de trabalho, reduziu o peso da indústria geral e aumento do peso da educação, saúde e serviços sociais e houve uma mudança na organização das faixas de salário mínimo, com perda da participação da faixa exata (0,9 a 1,1 SM) e aumento da faixa mais alta (mais de 2 SM).

VI. RESULTADOS

6.1. Análise agregada

Iniciaremos pela decomposição padrão de Oaxaca-Blinder, a qual examina a diferença de rendimentos médios entre dois grupos, no nosso caso, períodos. Após isso, analisaremos outros pontos da distribuição de rendimentos (10º percentil, 50º percentil e 90º percentil) e o índice de Gini. Os dados se encontram na tabela 4.

Tabela 4: Resultados Agregados da decomposição para Média, Gini e Percentis (p10, p50 e p90)

	Média (A)		Gini* (B)		p10* (C)		p50* (D)		p90* (E)	
	Coeficiente	*%*	*Coeficiente*	*%*	*Coeficiente*	*%*	*Coeficiente*	*%*	*Coeficiente*	*%*
2018-2012										
Predição 2018	7,35		0,057		6,696		7,314		8,401	
Predição 2012	7,25		0,058		6,597		7,168		8,347	
Mudança total	0,10		-0,001		0,099		0,146		0,054	
Efeito estrutura	0,02	17,5%	-0,003	365,8%	0,052	52,7%	0,081	55,2%	-0,074	-137,1%
Efeito composição	0,08	82,5%	0,002	-265,8%	0,047	47,3%	0,065	44,8%	0,127	237,1%
2014-2012										
Predição 2014	7,31		0,058		6,687		7,182		8,356	
Predição 2012	7,25		0,058		6,597		7,169		8,347	
Mudança total	0,06		0,000		0,090		0,014		0,009	
Efeito estrutura	0,01	9,1%	-0,001	230,7%	0,020	22,1%	-0,003	-23,0%	-0,064	-723,4%
Efeito composição	0,05	90,9%	0,001	-130,7%	0,070	77,9%	0,017	123,0%	0,073	823,4%
2016-2014										
Predição 2016	7,30		0,057		6,648		7,162		8,354	
Predição 2014	7,31		0,058		6,690		7,182		8,349	
Mudança total	-0,01		0,000		-0,042		-0,020		0,005	
Efeito estrutura	0,02	-288,7%	-0,002	403,1%	0,099	-237,1%	-0,014	71,9%	0,025	478,6%
Efeito composição	-0,03	388,7%	0,001	-303,1%	-0,141	337,1%	-0,006	28,1%	-0,020	-378,6%
2018-2016										
Predição 2018	7,35		0,057		6,696		7,314		8,401	
Predição 2016	7,30		0,057		6,644		7,162		8,355	
Mudança total	0,05		0,000		0,052		0,152		0,046	
Efeito estrutura	-0,01	-24,2%	-0,001	-1392,9%	-0,057	-111,1%	0,099	65,4%	-0,042	-91,6%
Efeito composição	0,06	124,2%	0,001	1492,7%	0,109	211,1%	0,052	34,6%	0,088	191,6%

**Regressão RIF.*

Fonte: PNAD Contínua. Elaboração própria.

Entre o período completo (2012-2018), o logaritmo da renda média dos ocupados com jornadas integrais (pelo menos 8 horas por dia) aumentou 1,38%, subindo de 7,25 para 7,35. O subperíodo de 2012 e 2014 foi o que houve a maior variação da média (aumento de 0,83%), passando de 7,25 para 7,31. Houve uma pequena redução no logaritmo da renda média no subperíodo de 2014-2016 (redução de 0,14%), passando de 7,31 para 7,30.

Podemos observar, na coluna A da tabela 4, que entre 2012-2018, o efeito composição foi o responsável por 82,5% do aumento do salário médio, enquanto o efeito estrutura foi responsável por 17,5% desse aumento. Porém, os efeitos composição e estrutura não são constantes ao logo dos subperíodos. Nos períodos 2012-2014 e 2016-2018, o efeito composição foi responsável por um aumento do salário médio, tendo seu maior efeito no subperíodo 2016-2018 e reduzindo no período 2014-2016. Quanto ao efeito estrutura nos subperíodos, este foi responsável por aumentar o salário médio entre 2012-2014 e entre 2014-2016, em contra partida, foi responsável por reduzir entre 2016-2018. Seus efeitos, em geral, tiveram menos influência do que o efeito composição.

Ao observarmos diferentes medidas além da média, no caso do índice de Gini (coluna B da tabela 4) para o logaritmo do rendimento do

trabalho principal, vemos que não houve grandes mudanças, com todos os subperíodos mantendo-se relativamente constantes. Também podemos observar que em todos os subperíodos o efeito composição contribuiu para a concentração da distribuição de renda, apesar do efeito estrutura ter sentido oposto em todos subperíodos, sobrepondo o efeito composição entre 2014-2016 (período em que o SM teve seu mais valor real).

Verificando os percentis 10 (10% mais pobres), 50 (mediana) e 90 (10% mais ricos) da distribuição de rendas, observamos que estes tiveram um desempenho semelhante, isto é, entre 2012 e 2018, os três percentis aumentaram, ainda que com intensidade diferente. O rendimento dos 10% mais pobres aumentou em 1,50%, a mediana em 2,04% e o dos 10% mais ricos em 0,64%.

Quando se analisa cada subperíodo, vemos que o rendimento dos 10% mais pobres foi afetado negativamente (-0,63%) durante o subperíodo 2016-2014 (mesmo período em que o peso dos ocupados que ganhavam na faixa de 1 SM, isto é, de 0,9 a 1,1 SM, diminuiu em 4,7%), enquanto seu maior efeito foi um aumento de 1,36% entre 2014-2012. A respeito da mediana da distribuição de rendas, esta também teve uma redução no subperíodo 2016-2014 (-0,27%), com um aumento de 2,12% no subperíodo seguinte. Já o rendimento dos 10% mais ricos, este cresceu em todos os subperíodos, mantendo-se relativamente estável entre 2016-2014 (aumento de 0,06%) e tendo seu maior aumento entre 2018-2016 (0,55%). Aparentemente, o "pior" período para os rendimentos do trabalho foi entre 2016-2014, e parece que houve uma melhora a partir de 2016, principalmente para a mediana.

A redução da desigualdade da distribuição de renda do trabalho, apesar de baixa, parece ter sido mais influenciada pelos aumentos na cauda inferior da distribuição (entre 2012-2014 e 2016-2018), isto é, mesmo com um aumento na cauda superior da distribuição, o aumento na cauda inferior foi mais intenso.

Observando os efeitos composição e estrutura para estes percentis (colunas C, D e E da tabela 4), podemos ver que no período completo (2012-2018), o efeito composição foi responsável por aumentos nos rendimentos dos três pontos da distribuição, enquanto o efeito estrutura só não foi responsável por aumento no rendimento do p90 (apesar de tal queda ser compensada pelo efeito composição superior).

Em relação aos 10% mais pobres (p10), o efeito composição só não foi positivo entre 2014-2016, contribuindo com 77,9% do aumento da renda entre 2012-2014 e com 211,1% entre 2016-2018 (superando o efeito estrutura negativo neste último período), já o efeito estrutura só foi negativo entre 2016-2018. Para a mediana da distribuição (p50), o efeito composição só foi negativo no período 2014-2016 (assim como para o p10), mas o efeito estrutura só foi positivo entre 2016 e 2018 (contrário ao p10), contribuindo com 65,4% (quase duas vezes maior que o efeito composição) do aumento da renda neste percentil. Em relação aos 10% mais ricos (p90), o efeito composição só foi positivo entre 2012-2014 e entre 2016-2018 (superando o efeito estrutura negativo), já o efeito estrutura só foi positivo entre 2014-2016, compensando o efeito composição negativo deste período. Observamos que nenhum dos dois efeitos foram constantes (sempre aumentando ou sempre reduzindo os rendimentos) nos três percentis.

Uma medida alternativa de desigualdade de renda é a diferença interquantílica, a qual apresentaremos na próxima tabela (tabela 5). Fizemos o cálculo da diferença entre os 10% mais ricos e os 10% mais pobres (diferença 90-10) e a diferença entre a mediana e os 10% mais pobres (diferença 50-10), esta última possibilitando observar melhor o que acontece na primeira metade da distribuição de renda. A diferença interquantílica para a diferença 50-10, como visto em Brito (2015), é a razão entre a variação da mediana em certo período e a variação do p10 no mesmo período.

Tabela 5: Resultados Agregados da decomposição para as diferenças interquantílicas 90-10 e 50-10

	90-10*		50-10*	
	Coeficiente	*%*	*Coeficiente*	*%*
2018-2012				
Predição 2018	1,705		0,618	
Predição 2012	1,750		0,572	
Mudança total	-0,045		0,047	
Efeito estrutura	-0,123	269,8%	0,027	58,6%
Efeito composição	0,077	-169,8%	0,019	41,4%
2014-2012				
Predição 2014	1,669		0,495	
Predição 2012	1,750		0,572	
Mudança total	-0,081		-0,077	
Efeito estrutura	-0,083	102,5%	-0,023	30,6%
Efeito composição	0,002	-2,5%	-0,053	69,4%
2016-2014				
Predição 2016	1,707		0,515	
Predição 2014	1,669		0,495	
Mudança total	0,038		0,020	
Efeito estrutura	-0,078	-205,3%	-0,111	-558,8%
Efeito composição	0,116	305,3%	0,131	658,8%
2018-2016				
Predição 2018	1,705		0,618	
Predição 2016	1,707		0,515	
Mudança total	-0,002		0,103	
Efeito estrutura	0,032	-1554,5%	0,171	165,4%
Efeito composição	-0,034	1654,5%	-0,068	-65,4%

**Regressão RIF.*

Fonte: PNAD Contínua. Elaboração própria.

Houve uma pequena redução na diferença entre os 10% mais ricos e os 10% mais pobres da distribuição de rendas, de 1,750 vezes em 2012 para 1,705 em 2018, onde o efeito composição contribuiu aumentando esta diferença (0,077), sendo compensado pelo efeito estrutura (-0,123). Porém, a diferença entre a mediana e os 10% mais pobres da distribuição aumentou, de 0,572 para 0,618, tendo contribuições no sentido de aumentar tanto do efeito composição (0,019, responsáveis por 41,4%) como do efeito estrutura (0,027, responsáveis por 58,6%).

Dos três subperíodos, para o diferencial 90-10, só teve aumento de 0,038 entre 2014 e 2016 (devido a uma redução mais forte do rendimento do p10), mas sem superar a redução ocorrida entre 2012 e 2014 (-0,081). Já para o diferencial 50-10, houve redução apenas entre 2012 e 2014 (-0,077), sendo preponderada pelos aumentos nos períodos seguintes (0,020 entre 2014-2016 e 0,103 entre 2016-2018). O único subperíodo em que o efeito composição contribuiu para a redução da desigualdade em ambos diferenciais foi entre 2016 e 2018 (tendo efeito mais significativo no

aumento da desigualdade entre 2014 e 2016). Oposto ao efeito composição, 2016 e 2018 foi o único subperíodo em que o efeito estrutura não contribuiu para reduzir a desigualdade em ambos os diferenciais, mostrando, talvez, que assim como em Brito (2015), o efeito estrutura foi mais significativo para determinar a diferença total em cada subperíodo (com exceção do último), ou como dito pela autora, a diferença intra grupos prevaleceu sobre a diferença entre grupos.

As reduções de -0,077 para o diferencial 50-10 e de -0,081 para o diferencial 90-10 no subperíodo 2012-2014 podem ser explicadas pelo aumento de rendimento do p10 ter sido superior aos do p50 e do p90 (1,36% contra 0,19% e 0,11% respectivamente). Neste período, para o diferencial 50-10, o efeito composição foi mais importante para a redução do diferencial (-0,053), enquanto para o diferencial 90-10, o efeito estrutura desempenhou um papel maior na redução da desigualdade (-0,083).

Resumindo, no período inteiro (2012 a 2018), para as estatísticas observadas, o efeito estrutura teve um peso maior para a média, percentis 10 e 50, deixando a impressão de que o retorno das características dos indivíduos foi o agente mais explicativo das variações que ocorreram no período. Enquanto apenas para o percentil 90 o efeito composição desempenhou um papel mais importante. Para as medidas de desigualdade (índice de Gini e diferenças interquantílicas), o efeito estrutura também foi o maior contribuinte para a redução da desigualdade, isto é, as diferenças intra grupos ilustraram mais que as diferenças entre grupos, exceto pela diferença 50-10, onde o efeito estrutura contribuiu mais para o aumento da desigualdade do que o efeito composição.

Na próxima seção, analisaremos quais variáveis desempenharam um papel mais relevante na explicação das mudanças de composição dos ocupados com jornadas de trabalho de pelo menos 40 horas por semana. Para identificar o efeito do piso salarial, como dito anteriormente, fizemos como Brito (2015) e criamos faixas de salário minimo para categorizar o salário de cada pessoa, possibilitando a observação da relação entre o rendimento de cada indivíduo com o salário mínimo real de cada ano. Seguindo a autora, podemos considerar o efeito do salário mínimo de duas formas: a primeira é o efeito direto naqueles que estão próximos ao valor do SM exato (de 0,9 a 1,1 SM) e a segunda é o efeito expandido para aqueles que ganham em volta do SM, no qual costumam ocorrer vazamentos (os chamados *spillovers*) e, também, um efeito numerário (de 0,5 a 1,5 SM).

6.2. Efeito composição (análise detalhada)

Faremos primeiro a decomposição da média (tabela 6) do logaritmo do salário no trabalho principal dos ocupados com jornadas de 40 horas semanais ou mais.

Tabela 6: Decomposição de Oaxaca-Blinder (média) para o logaritmo do salário no trabalho principal dos ocupados* - Ano A – Ano B

	2014-2012			2016-2014			2018-2016			2018-2012		
	Coeficiente	*EP robusto*	%	*Coeficiente*	*EP robusto*	%	*Coeficiente*	*EP robusto*	%	*Coeficiente*	*EP robusto*	%
Predição A	7,307	0,002		7,299	0,002		7,346	0,002		7,346	0,002	
Predição B	7,248	0,002		7,307	0,002		7,299	0,002		7,248	0,002	
Diferença	0,059	0,003		-0,008	0,003		0,047	0,003		0,098	0,003	
Estrutura	0,005	0,001	9,1%	0,022	0,001	-288,7%	-0,011	0,001	-24,2%	0,017	0,001	17,5%
Composição	0,054	0,003	90,9%	-0,030	0,003	388,7%	0,058	0,003	124,2%	0,081	0,003	82,5%
Até 0,5 SM	0,013	0,001	22,2%	-0,010	0,001	129,1%	0,010	0,001	21,9%	0,013	0,001	13,6%
0,5 a 0,9 SM	0,002	0,000	3,8%	-0,008	0,000	105,6%	0,004	0,000	8,7%	-0,002	0,000	-2,1%
0,9 a 1,1 SM	0,000	0,000	0,7%	0,003	0,000	-39,8%	-0,001	0,000	-2,8%	0,002	0,000	2,1%
1,1 a 1,5 SM	0,003	0,000	5,0%	0,005	0,000	-59,2%	-0,007	0,000	-15,0%	*0,000*	0,000	0,1%
1,5 a 2 SM	-0,014	0,001	-24,1%	0,011	0,001	-148,3%	*0,000*	0,001	0,8%	-0,003	0,001	-2,8%
Mais de 2 SM	0,044	0,002	75,1%	-0,039	0,002	503,4%	0,046	0,002	99,1%	0,052	0,002	52,8%
Educação	0,003	0,000	4,7%	0,005	0,000	-59,2%	0,005	0,000	9,8%	0,012	0,000	12,7%
Idade	0,003	0,000	5,4%	0,005	0,000	-69,0%	0,002	0,000	4,9%	0,012	0,001	11,8%
Idade²	-0,001	0,000	-1,0%	-0,001	0,000	16,1%	-0,001	0,000	-1,4%	-0,003	0,001	-2,9%
Mulher	*0,000*	0,000	-0,2%	0,000	0,000	4,5%	0,000	0,000	-0,5%	-0,001	0,000	-0,9%
Não branco	0,000	0,000	-0,8%	0,000	0,000	5,8%	-0,001	0,000	-1,4%	-0,002	0,000	-1,7%
Chefe família	*0,000*	0,000	0,1%	0,000	0,000	-3,0%	-0,001	0,000	-1,1%	0,000	0,000	-0,3%
Região	*0,000*	0,000	0,2%	*0,000*	0,000	1,3%	0,000	0,000	0,5%	0,000	0,000	0,2%
Formal	0,000	0,000	-0,4%	0,000	0,000	1,0%	0,000	0,000	0,3%	0,000	0,000	-0,1%
Setor	0,000	0,000	0,1%	*0,000*	0,000	0,5%	0,000	0,000	0,4%	0,000	0,000	0,2%
N =	250958			252271			237173			235860		

*Apenas trabalhadores com jornadas de trabalho de 40 horas ou mais por semana.
Não significativo a 10%: coeficiente em itálico. Referência: menos de 1 ano de estudo, homem, não chefe, não branco, região Sul, setor Agrícola.
Fonte: PNAD Contínua. Elaboração própria.

Já vimos anteriormente que a média dos rendimentos dos ocupados aumentou entre 2012 e 2018. O efeito composição foi mais importante para este aumento do que o efeito estrutura (última coluna da tabela 6). Analisando os elementos do efeito composição, vemos que a variável que teve maior efeito neste aumento do rendimento médio foi a *dummy* que identifica aqueles que receberam mais de 2 salários mínimos no período (52,8%), isso quer dizer que ter mais pessoas recebendo acima de 2 SM contribuiu para aumentar o salario médio. Como esperado, ter mais mulheres e não brancos contribuiu negativamente, reduzindo a renda média (-0,9% e -1,7% respectivamente), isso não é nenhuma surpresa, visto que historicamente, mulheres e não brancos recebem menos que homens e brancos, respectivamente, logo, quanto mais mulheres e não brancos, mais a média se reduz. Ao contrário de Brito (2015) para o período entre 1995 e 2011, a faixa que identifica aqueles que recebem o piso do salário mínimo (0,9 a 1,1 SM), ou seja, a faixa exata do mínimo, contribuiu para aumentar a renda média em 2,1% (embora ainda seja inferior à contribuição da faixa mais de 2 SM), consequência esta da perda de peso da faixa exata e aumento da faixa acima de 2 SM. Outras diferenças foram as contribuições das faixas de quem recebe até 0,5 SM (13,6%) e da faixa entre 1,1 e 2 SM (- 2,7%), as quais contribuíram para aumentar e reduzir a renda média, respectivamente.

Além das faixas de quem recebeu até 0,5 SM (13,6%) e mais de 2 SM (52,8%), a variável da parte explicada que teve maior impacto no aumento da remuneração média foi a educação (12,7%), seguida pela idade (uma *proxy* de experiência) que contribuiu com o aumento da renda média em 11,8%.

Analisando os subperíodos, vemos que a educação e a idade sempre contribuíram com o aumento da renda média, com aumentos estáveis ao logo dos anos. Por outro lado, mais mulheres e mais não brancos sempre contribuíram negativamente com o rendimento médio (o que não é nenhuma novidade, visto que este é quase um padrão na literatura), tendo efeito não significativo para mulheres entre 2012 e 2014.

O salário mínimo sofreu uma pequena desvalorização de 2016 para 2018, o que pode explicar o único efeito negativo da faixa exata (entre 0,9 a 1,1 SM) no período (-2,8%). Porém, sua contribuição não tem grandes impactos na renda média, pois a proporção dos ocupados que recebem a faixa exata não é relativamente alta (20,10% em 2018) se comparada a faixa de mais de 2 SM (33,89% em 2018), que foi a faixa com maior relevância entre os ocupados no período.

Assim como em Brito (2015), podemos ver com a decomposição que a faixa de mais de 2 SM continua sendo a faixa com maior influência sobre o rendimento médio, com efeitos predominantemente positivos (com exceção de 2014-2016). Os períodos em que essa faixa aumentou (2012-2014 e 2016-2018) foram os mesmos em que a remuneração média também aumentou, tendo apenas uma pequena redução de 2014 para 2016 (-3,3%), o qual, coincidentemente, foi o único período em que a remuneração média se reduziu. Adicionalmente, observamos que esta faixa foi a variável mais influente entre os fatores da parte explicada em todos os subperíodos.

Tabela 7: Decomposição de Oaxaca-Blinder (Gini*) para o logaritmo do salário no trabalho principal dos ocupados** - Ano A – Ano B

	2014-2012			2016-2014			2018-2016			2018-2012		
	Coeficiente	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%
Predição A	0,058	0,000		0,057	0,000		0,057	0,000		0,057	0,000	
Predição B	0,058	0,000		0,058	0,000		0,057	0,000		0,058	0,000	
Diferença	0,000	0,000		0,000	0,000		*0,000*	0,000		-0,001	0,000	
Estrutura	-0,001	0,000	230,7%	-0,002	0,000	403,1%	-0,001	0,000	-1392,9%	-0,003	0,000	365,8%
Composição	0,001	0,000	-130,7%	0,001	0,000	-303,1%	0,001	0,000	1492,7%	0,002	0,000	-265,8%
Até 0,5 SM	-0,001	0,000	210,9%	0,001	0,000	-245,4%	-0,001	0,000	-1866,2%	-0,001	0,000	148,9%
0,5 a 0,9 SM	0,000	0,000	-2,6%	0,000	0,000	-46,6%	0,000	0,000	22,6%	0,000	0,000	-1,4%
0,9 a 1,1 SM	-0,001	0,000	166,8%	0,002	0,000	-426,1%	-0,001	0,000	-1475,6%	0,001	0,000	-134,8%
1,1 a 1,5 SM	0,002	0,000	-444,3%	-0,001	0,000	338,3%	0,002	0,000	3930,9%	*0,000*	0,000	-3,1%
1,5 a 2 SM	0,000	0,000	8,7%	-0,001	0,000	328,3%	*0,000*	0,000	-77,4%	0,000	0,000	-37,7%
Mais de 2 SM	0,000	0,000	-44,7%	0,000	0,000	-31,1%	0,000	0,000	395,6%	0,000	0,000	-48,6%
Educação	0,000	0,000	-67,5%	0,000	0,000	-121,3%	0,000	0,000	597,5%	0,001	0,000	-115,9%
Idade	0,000	0,000	-14,1%	0,000	0,000	-44,1%	0,000	0,000	124,8%	0,000	0,000	-43,3%
Idade²	0,000	0,000	-21,1%	0,000	0,000	-70,0%	0,000	0,000	186,6%	0,000	0,000	-57,8%
Mulher	*0,000*	0,000	0,0%	0,000	0,000	6,2%	0,000	0,000	-1,5%	0,000	0,000	4,4%
Não branco	0,000	0,000	-13,0%	0,000	0,000	11,2%	0,000	0,000	-115,0%	0,000	0,000	17,6%
Chefe família	*0,000*	0,000	9,2%	0,000	0,000	-5,8%	0,000	0,000	-81,6%	0,000	0,000	3,4%
Região	0,000	0,000	3,4%	0,000	0,000	-6,7%	0,000	0,000	-29,9%	*0,000*	0,000	0,1%
Formal	0,000	0,000	5,5%	0,000	0,000	-3,1%	0,000	0,000	-48,6%	0,000	0,000	-0,1%
Setor	0,000	0,000	6,2%	*0,000*	0,000	0,0%	0,000	0,000	-55,1%	0,000	0,000	-2,3%
N =	250958			252271			237173			235860		

*Calculado com Regressão RIF.

**Apenas trabalhadores com jornadas de trabalho de 40 horas ou mais por semana.

Não significativo a 10%: coeficiente em itálico. Referência: menos de 1 ano de estudo, homem, não chefe, não branco, região Sul, setor Agrícola. *Fonte: PNAD Contínua. Elaboração própria.*

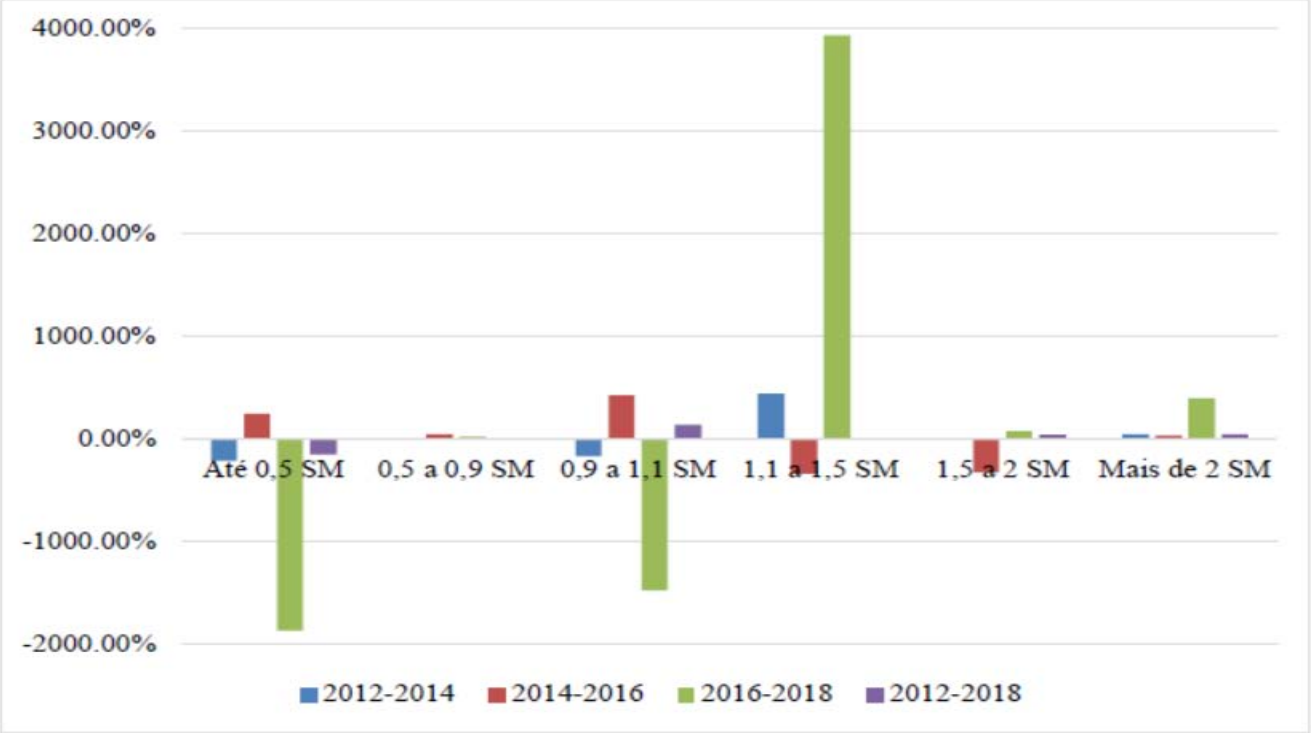
Como a desigualdade de rendas entre os períodos se manteve relativamente estável, algumas covariadas tiveram sua contribuição para o efeito composição um tanto quanto exageradas, tornando sua análise menos informativa. Porém, faremos a análise mesmo assim.

A decomposição para o índice de Gini para o período de 2012 a 2018 (última coluna da tabela 7) nos mostra que, apesar da redução da desigualdade ter sido baixa (0,058 para 0,057), ainda houve uma redução. Analisando os efeitos, vemos que o efeito composição contribuiu para aumentar a desigualdade, sendo sobreposto pelo efeito estrutura, ou seja, apesar das diferenças entre grupos terem contribuído para concentrar a distribuição de rendas, as diferenças intra grupos contribuíram para reduzir a desigualdade, sendo superior. Os fatores da parte explicada que tiveram maior influência no índice de Gini foram: faixa exata do SM (134,8%), educação (115,9%), Idade² (57,8%) e faixa de mais de 2 SM (48,6%). Esse forte efeito da educação parece evidenciar que quanto mais escolarização, maior a concentração de renda.

Nosso resultado corrobora com o encontrado em Brito (2015), o qual concluiu que a educação contribuiu para aumentar a desigualdade de renda entre 1995 e 2011, mesmo sendo para um período anterior ao nosso.

Para o período de 2012 a 2018, a faixa até 0,5 SM contribuiu para reduzir a desigualdade (-148,9%), por outro lado, as outras faixas de SM contribuíram para aumentar a desigualdade, isto é, tiveram um efeito concentrador, principalmente as faixas entre 0,9 e 1,5 SM (137,9%), o que evidencia a existência de um efeito *spillover* do SM. Mulheres e não brancos também contribuíram para reduzir a desigualdade de rendas, com 4,4% e 17,6%, respectivamente.

O gráfico abaixo evidencia as contribuições de cada faixa do SM para a variação do índice de Gini em todos os subperíodos. Para comparação, trazemos o gráfico feito por Brito (2015) para o período 1995-2011 no anexo (Figura 2A).



Fonte: PNAD Contínua. Elaboração Própria.

Gráfico 3: Contribuição das faixas de SM para a variação do Índice de Gini por subperíodos – 2012-2018

A faixa exata do SM (0,9 a 1,1 SM) contribuiu para reduzir a desigualdade de renda em quase todos os subperíodos, exceto por 2014-2016, período em que o salario minimo teve seu maior valor real (valorização de 2,8%), diminuindo no período seguinte (-0,6%). Porém, ao analisarmos o período inteiro (2012 a 2018), vemos que a faixa exata do SM contribuiu para aumentar a desigualdade. A faixa de 1,1 a 1,5 SM contribuiu mais com o aumento da desigualdade de renda (exceto por 2014-2016), sendo mais intenso no período de 2016 a 2018, enquanto a faixa mais baixa (até 0,5 SM) contribuiu para reduzir a desigualdade no mesmo período.

Considerando o efeito direto da faixa exata do SM (0,9 a 1,1 SM) entre 2012 e 2018, vemos que ele contribuiu em 134,8% para a concentração da renda, isto é, para o aumento da desigualdade de rendas observada através do índice de Gini. Se observarmos o efeito expandido do SM (0,5 a 1,5 SM), este contribuiu em 139,3% para a concentração de renda no período 2012-2018, evidenciando o efeito *spillover* do SM.

Fora a decomposição detalhada para média e para o Gini, também fizemos as decomposições para os percentis 10, 50 (mediana) e 90 da distribuição de rendas. A tabela a seguir (tabela 8) é da decomposição para o percentil 10.

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Tabela 8: Decomposição de Oaxaca-Blinder (Q10*) para o logaritmo do salário no trabalho principal dos ocupados** - Ano A – Ano B

	20142012			**20162014**			**2018-2016**			**2018-2012**		
	Coeficiente	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%
Predição A	6,687	0,005		6,648	0,008		6,696	0,005		6,696	0,005	
Predição B	6,597	0,005		6,690	0,005		6,644	0,007		6,597	0,005	
Diferença	0,090	0,007		-0,042	0,009		0,052	0,009		0,099	0,006	
Estrutura	0,020	0,006	22,1%	0,099	0,007	-237,1%	-0,057	0,009	-111,1%	0,052	0,006	52,7%
Composição	0,070	0,003	77,9%	-0,141	0,005	337,1%	0,109	0,004	211,1%	0,047	0,003	47,3%
Até 0,5 SM	0,041	0,004	45,3%	-0,035	0,004	83,9%	0,049	0,006	94,7%	0,042	0,004	42,5%
0,5 a 0,9 SM	0,007	0,001	8,0%	-0,053	0,003	126,3%	0,020	0,002	38,2%	-0,007	0,001	-6,7%
0,9 a 1,1 SM	-0,008	0,002	-9,1%	-0,087	0,003	207,7%	0,046	0,003	88,9%	-0,044	0,002	-44,1%
1,1 a 1,5 SM	0,022	0,002	24,5%	0,050	0,003	-118,1%	-0,091	0,003	-175,9%	*-0,001*	0,002	-0,7%
1,5 a 2 SM	-0,044	0,002	-48,5%	0,046	0,003	-109,2%	*0,002*	0,003	3,3%	-0,009	0,002	-8,7%
Mais de 2 SM	0,050	0,002	55,6%	-0,060	0,003	143,2%	0,080	0,004	155,1%	0,059	0,003	59,2%
Educação	0,001	0,000	0,8%	*0,000*	0,000	0,2%	0,002	0,000	3,6%	0,003	0,001	3,1%
Idade	0,002	0,001	2,2%	0,003	0,001	-6,1%	0,005	0,001	9,1%	0,007	0,003	6,8%
Idade^2	0,001	0,001	1,6%	-0,003	0,001	8,3%	-0,004	0,001	-8,6%	-0,005	0,003	-5,1%
Mulher	*0,000*	0,000	0,0%	0,000	0,000	0,6%	0,000	0,000	-0,3%	0,000	0,000	-0,3%
Não branco	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%	*0,000*	0,000	-0,1%	*0,000*	0,000	0,0%
Chefe família	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%	*0,000*	0,000	0,1%	*0,000*	0,000	0,0%
Região	0,000	0,000	-0,5%	0,000	0,000	-0,5%	0,001	0,000	1,6%	0,000	0,000	0,2%
Formal	0,001	0,000	1,1%	0,000	0,000	0,5%	-0,001	0,000	-1,1%	0,001	0,000	0,6%
Setor	0,000	0,000	0,2%	*0,000*	0,000	0,3%	0,001	0,000	2,4%	0,000	0,000	0,4%
N =	250958			252271			237173			235860		

**Apenas trabalhadores com jornadas de trabalho de 40 horas ou mais por semana.

Não significativo a 10%: coeficiente em itálico. Referência: menos de 1 ano de estudo, homem, não chefe, não branco, região Sul, setor Agrícola.

Fonte: PNAD Contínua. Elaboração própria.

Entre 2012 e 2018 (última coluna da tabela 7), o rendimento do 10º percentil aumentou em 1,5%, com maior contribuição do efeito estrutura (52,7%). Ao contrário do que observamos na decomposição para a média, a educação teve uma contribuição inferior para o aumento da renda dos ocupados neste percentil (3,1%). Diferentemente do que observamos anteriormente, a redução do peso da faixa exata do SM (0,9 a 1,1 SM) contribuiu para reduzir o rendimento dos 10% mais pobres (-44,1%). Desta forma, vemos que a pequena valorização do salário mínimo entre 2012 e 2018 e sua perda de peso na distribuição por faixas de salário mínimo refletiram negativamente sobre os 10% mais pobres. Novamente, a faixa de mais de 2 SM foi a que teve maior contribuição para o aumento dos rendimentos (59,2%), o que pode ser explicado pelo fato do peso de sua faixa ter sido o maior ao longo do período.

Para o 10º percentil, temos o mesmo problema de relativa estabilidade nos subperíodos 2014-2016 e 2016-2018, o que torna sua análise menos informativa. Neste caso, portanto, analisaremos apenas a decomposição detalhada para o subperíodo 2012-2014. Foi justamente nesse período (2012-2014) que o aumento da renda dos 10% mais pobres foi mais forte, tendo o efeito composição contribuído mais que o efeito estrutura (77,9% e 22,1%, respectivamente), conforme observamos na 1ª coluna da tabela 7. Assim como foi para o período todo, para 2012-2014, a educação também contribuiu muito pouco para o aumento da renda deste percentil (0,8%), visto que os ocupados deste percentil costumam ter baixa escolaridade, e uma maior relevância das faixas de SM, com contribuição líquida de 75,8%, dos quais o mais relevante foi a faixa de mais de 2 SM. Em contrapartida, a faixa exata do SM também contribuiu para reduzir a renda do 10º percentil (-9,1%).

Na tabela a seguir (tabela 9), trazemos a decomposição para a mediana (p50) da distribuição de rendas. Como vimos anteriormente, a renda mediana só não aumentou no subperíodo 2014-2016, e seu maior aumento foi entre 2016 e 2018, com um efeito líquido de 33,8% das faixas de SM. Entre 2012 e 2018, ambos os efeitos (composição e estrutura) contribuíram para aumentar o rendimento mediano (44,8% e 55,2%, respectivamente), onde para o efeito composição, a faixa de mais de 2 SM foi a principal causa destes 44,8% (31,5%), o que, novamente, mostra o resultado do aumento da participação desta faixa de SM nos ocupados. Igual ao p10, a educação e a idade (experiência) parecem ter pouca influência no aumento do rendimento do p50, sendo inferiores neste percentil.

A faixa exata do mínimo (0,9 a 1,1 SM) contribuiu em 14,1% com o aumento da renda do p50 entre 2012 e 2018.

Tabela 9: Decomposição de Oaxaca-Blinder (Q50*) para o logaritmo do salário no trabalho principal dos ocupados** - Ano A – Ano B

	2014-2012			2016-2014			2018-2016			2018-2012		
	Coeficiente	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*
Predição A	7,182	0,002		7,162	0,002		7,314	0,002		7,314	0,002	
Predição B	7,169	0,002		7,182	0,002		7,162	0,002		7,168	0,002	
Diferença	0,014	0,003		-0,020	0,003		0,152	0,003		0,146	0,003	
Estrutura	-0,003	0,001	-23,0%	-0,014	0,001	71,9%	0,099	0,001	65,4%	0,081	0,001	55,2%
Composição	0,017	0,003	123,0%	-0,006	0,003	28,1%	0,052	0,003	34,6%	0,065	0,003	44,8%
Até 0,5 SM	0,006	0,001	46,8%	-0,004	0,001	21,7%	0,004	0,001	2,9%	0,007	0,001	4,5%
0,5 a 0,9 SM	0,004	0,001	26,0%	-0,012	0,001	61,4%	0,006	0,001	3,9%	-0,003	0,001	-2,2%
0,9 a 1,1 SM	0,004	0,001	28,7%	0,028	0,001	-141,3%	-0,013	0,001	-8,3%	0,021	0,001	14,1%
1,1 a 1,5 SM	-0,003	0,000	-20,3%	-0,009	0,001	47,2%	0,014	0,001	9,1%	*0,000*	0,000	0,1%
1,5 a 2 SM	-0,034	0,001	-251,6%	0,026	0,001	-133,3%	*0,001*	0,002	0,6%	-0,007	0,002	-4,6%
Mais de 2 SM	0,039	0,002	289,9%	-0,034	0,002	174,3%	0,040	0,002	26,2%	0,046	0,002	31,5%
Educação	0,000	0,000	2,6%	0,000	0,000	-1,7%	0,000	0,000	0,3%	0,002	0,000	1,1%
Idade	0,001	0,000	8,8%	0,001	0,000	-5,4%	0,001	0,000	0,6%	0,004	0,001	2,8%
Idade²	-0,001	0,000	-7,3%	-0,001	0,000	5,3%	-0,001	0,000	-0,6%	-0,003	0,001	-2,4%
Mulher	*0,000*	0,000	-0,3%	0,000	0,000	0,6%	0,000	0,000	0,0%	0,000	0,000	-0,2%
Não branco	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%
Chefe família	*0,000*	0,000	0,0%	0,000	0,000	-0,2%	0,000	0,000	-0,1%	0,000	0,000	0,0%
Região	0,000	0,000	-1,5%	0,000	0,000	-0,4%	0,000	0,000	0,1%	0,000	0,000	0,1%
Formal	0,000	0,000	0,9%	0,000	0,000	-0,2%	0,000	0,000	-0,1%	0,000	0,000	0,1%
Setor	*0,000*	0,000	0,1%	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%	*0,000*	0,000	0,0%
N =	250958			252271			237173			235860		

**Apenas trabalhadores com jornadas de trabalho de 40 horas ou mais por semana.

Não significativo a 10%: coeficiente em itálico. Referência: menos de 1 ano de estudo, homem, não chefe, não branco, região Sul, setor Agrícola. Fonte: PNAD Contínua. Elaboração própria.

Tabela 10: Decomposição de Oaxaca-Blinder (Q90*) para o logaritmo do salário no trabalho principal dos ocupados** - Ano A – Ano B

	2014-2012			2016-2014			2018-2016			2018-2012		
	Coeficiente	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*	*Coeficiente*	*Erro padrão*	*%*
Predição A	8,356	0,004		8,354	0,005		8,401	0,005		8,401	0,005	
Predição B	8,347	0,004		8,349	0,004		8,355	0,005		8,347	0,004	
Diferença	*0,009*	0,006		*0,005*	0,006		0,046	0,007		0,054	0,007	
Estrutura	-0,064	0,005	-723,4%	0,025	0,005	478,6%	-0,042	0,007	-91,6%	-0,074	0,006	-137,1%
Composição	0,073	0,003	823,4%	-0,020	0,003	-378,6%	0,088	0,004	191,6%	0,127	0,004	237,1%
Até 0,5 SM	0,002	0,000	17,7%	-0,001	0,000	-24,3%	0,002	0,000	3,4%	0,002	0,000	3,0%
0,5 a 0,9 SM	0,001	0,000	12,1%	-0,003	0,000	-65,2%	0,002	0,000	5,4%	-0,001	0,000	-1,8%
0,9 a 1,1 SM	0,001	0,000	15,7%	0,010	0,000	191,8%	-0,006	0,000	-13,3%	0,007	0,000	14,0%
1,1 a 1,5 SM	-0,005	0,000	-51,6%	-0,007	0,000	-131,7%	0,015	0,001	31,5%	*0,000*	0,000	0,3%
1,5 a 2 SM	0,011	0,001	127,7%	-0,008	0,000	-144,6%	*0,000*	0,001	-0,7%	0,002	0,001	4,2%
Mais de 2 SM	0,046	0,002	514,8%	-0,036	0,002	-693,6%	0,057	0,003	124,2%	0,054	0,002	100,8%
Educação	0,009	0,001	100,6%	0,014	0,001	277,9%	0,017	0,001	36,6%	0,040	0,001	74,5%
Idade	0,010	0,001	107,8%	0,015	0,002	294,7%	0,008	0,001	16,8%	0,033	0,004	61,7%
Idade²	*-0,001*	0,001	-8,6%	-0,003	0,001	-48,3%	*-0,001*	0,001	-2,2%	*-0,003*	0,004	-5,0%
Mulher	*0,000*	0,000	-2,6%	-0,001	0,000	-12,5%	0,000	0,000	-0,8%	-0,002	0,000	-3,5%
Não branco	-0,002	0,000	-17,4%	-0,001	0,000	-26,4%	-0,003	0,000	-5,5%	-0,005	0,000	-10,0%
Chefe família	*0,000*	0,000	2,2%	0,001	0,000	14,1%	-0,002	0,000	-3,9%	-0,001	0,000	-1,7%
Região	0,001	0,000	7,8%	-0,001	0,000	-11,9%	*0,000*	0,000	-0,4%	0,000	0,000	0,8%
Formal	0,000	0,000	-3,0%	*0,000*	0,000	0,9%	*0,000*	0,000	-0,1%	0,000	0,000	-0,3%
Setor	*0,000*	0,000	0,3%	*0,000*	0,000	0,4%	*0,000*	0,000	-0,1%	*0,000*	0,000	0,1%
N =	250958			252271			237173			235860		

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Fonte: PNAD Contínua. Elaboração própria.

Analisando o percentil 90 da distribuição de rendas (tabela 10, acima), vemos um aumento da renda (ainda que pouco) entre 2012 e 2018 (última coluna), mesmo com o efeito estrutura contribuindo para reduzir a renda deste percentil, a educação (74,5%) e a idade (61,7%) contribuíram fortemente para o efeito composição aumentar a renda (diferentemente dos outros percentis). Com exceção da faixa anterior ao SM exato (0,5 a 1,1 SM) e da faixa seguinte (1,1 a 1,5 SM) que não foi estatisticamente significativa, todas as faixas contribuíram com o aumento da renda dos ocupados no 90º percentil, com a faixa de mais de 2 SM, novamente, sendo a principal influência no aumento da renda, seguida pela faixa do SM exato (0,9 a 1,1 SM), que apesar de também contribuir para aumentar a renda, tem um efeito bem menor do que a faixa de mais de 2 SM (14%). Coincidindo com a análise de Brito (2015) para o p90 entre 1995 e 2011, ter mais mulheres e mais não brancos também contribuiu para reduzir a renda dos 10% mais ricos entre 2012 e 2018.

Observando os subperíodos, os dois primeiros (2012-2014 e 2014-2016) não tiveram mudanças estatisticamente significativas no rendimento do 90º percentil, portanto, analisaremos apenas o subperíodo 2016-2018. Entre 2016 e 2018, apesar do efeito estrutura ter contribuído negativamente, o rendimento do p90 aumentou devido ao efeito composição ter tido uma contribuição positiva, superando o efeito estrutura negativo. Os maiores contribuintes para o efeito composição positivo foram a faixa de mais de 2 SM (124,2%) e educação (36,6%), além desses, a idade também contribuiu para aumentar a renda (16,8%). Por outro lado, a faixa exata do SM (0,9 a 1,1 SM) contribuiu para reduzir o rendimento do p90 (-13,3%), assim como ter mais mulheres, não brancos e chefes de família (-0,8%, -5,5% e -3,9%, respectivamente) entre os ocupados.

Isto posto, após analisarmos estes três percentis da distribuição de rendas do trabalho (p10, p50 e p90), podemos concluir que a cauda inferior da distribuição sofre poucas alterações advindas da educação, sendo mais influenciada pelas faixas de SM, ou seja, pela política de salário mínimo, já na cauda superior, a política de salário mínimo continua tendo efeitos relevantes, mas ao contrário da cauda inferior, a educação e a idade também têm fortes influências sobre a renda. Por isso, a maior escolarização contribuiu para aumentar a renda dos mais ricos em relação aos mais pobres, o que, consequentemente, afetou de maneira positiva a renda média, embora serviu para aumentar a desigualdade de renda. Entretanto, a pequena valorização do salário minimo acabou contribuindo para aumentar a renda dos mais ricos (aumento do peso da faixa mais de 2 salários mínimos), enquanto diminuiu a dos mais pobres, além de ter afetado positivamente a renda média e aumentado a desigualdade de rendas.

6.3. Efeito estrutura (Índice de Gini)

Por último, analisaremos o impacto de cada variável explicativa na variável dependente para a parte não explicada, ou seja, para o efeito estrutura da decomposição para o índice de Gini. A parte não explicada tem um fator residual que é identificado pela constante do modelo, a qual, quanto maior seu peso, pior é o ajuste do modelo.

Tabela 11: Decomposição de Oaxaca-Blinder (Gini*) para o logaritmo do salário no trabalho principal dos ocupados** (efeito estrutura) - Ano A – Ano B

	20142012			2016-2014			2018-2016			2018-2012		
	Coeficiente	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%	*Coeficiente*	*Erro padrão*	%
Predição A	0,058	0,000		0,057	0,000		0,057	0,000		0,057	0,000	
Predição B	0,058	0,000		0,058	0,000		0,057	0,000		0,058	0,000	
Diferença	0,000	0,000		0,000	0,000		*0,000*	0,000		-0,001	0,000	
Composição	0,001	0,000	-130,7%	0,001	0,000	-303,1%	0,001	0,000	1492,7%	0,002	0,000	-265,8%
Estrutura	-0,001	0,000	230,7%	-0,002	0,000	403,1%	-0,001	0,000	-1392,9%	-0,003	0,000	365,8%
Até 0,5 SM	0,001	0,000	-184,2%	-0,001	0,000	139,1%	0,000	0,000	792,7%	0,001	0,000	-93,0%
0,5 a 0,9 SM	0,000	0,000	-90,4%	-0,001	0,000	205,8%	0,001	0,000	1487,1%	0,001	0,000	-63,8%
0,9 a 1,1 SM	0,000	0,000	96,7%	0,000	0,000	-75,2%	0,000	0,000	-665,5%	0,000	0,000	48,3%
1,1 a 1,5 SM	-0,001	0,000	158,7%	0,001	0,000	-241,1%	0,000	0,000	-943,6%	0,000	0,000	45,1%
1,5 a 2 SM	-0,001	0,000	151,0%	0,001	0,000	-190,7%	-0,001	0,000	-1491,2%	-0,001	0,000	100,1%
Mais de 2 SM	-0,004	0,000	954,9%	0,003	0,000	-678,9%	-0,003	0,000	-6484,6%	-0,005	0,000	574,4%
Educação	0,004	0,001	-786,1%	-0,005	0,001	1168,6%	*-0,001*	0,001	-1769,7%	-0,002	0,001	247,5%
Idade	*0,000*	0,003	-38,2%	*-0,001*	0,003	236,2%	*0,000*	0,003	560,1%	*-0,001*	0,003	61,9%
Idade²	*0,001*	0,002	-215,5%	*-0,001*	0,002	348,4%	*0,000*	0,002	300,2%	*0,000*	0,002	29,0%
Mulher	*-0,001*	0,000	215,5%	0,000	0,000	-81,7%	0,000	0,000	-904,4%	0,000	0,000	35,2%
Não branco	*0,000*	0,000	40,9%	*0,000*	0,000	-36,6%	*0,000*	0,000	-507,7%	*0,000*	0,000	37,3%
Chefe famílic	*0,000*	0,000	-21,7%	0,000	0,000	112,5%	*0,000*	0,000	381,6%	*0,000*	0,000	18,2%
Região	*0,001*	0,000	-118,4%	*0,000*	0,000	3,7%	*-0,001*	0,000	-1220,9%	*0,000*	0,000	12,6%
Formal	0,002	0,000	-354,9%	*0,000*	0,000	2,6%	*0,000*	0,000	58,3%	0,002	0,000	-200,7%
Setor	0,001	0,000	-262,1%	-0,003	0,000	688,6%	0,001	0,000	2766,2%	*0,000*	0,000	24,2%
Constante	-0,004	0,002	867,2%	0,005	0,002	-1198,3%	0,003	0,002	6248,6%	0,004	0,002	-510,5%
N =	250958			252271			237173			235860		

**Calculado com Regressão RIF.*

***Apenas trabalhadores com jornadas de trabalho de 40 horas ou mais por semana.*

Não significativo a 10%: coeficiente em itálico. Referência: menos de 1 ano de estudo, homem, não chefe, não branco, região Sul, setor Agrícola. Fonte: PNAD Contínua. Elaboração própria.

Conforme vimos anteriormente, apesar de não ter ocorrido mudanças consideráveis no índice de Gini para o logaritmo do salário no trabalho principal dos ocupados entre 2012 e 2018 (de 0,058 para 0,057), com subperíodos (como 2012-2014 e 2018-2016) sem mudança significativa, o efeito estrutura contribuiu para reduzir a desigualdade de rendas do trabalho principal, sendo superior à contribuição do efeito composição no aumento da desigualdade, a qual analisamos na seção anterior. Isto posto, analisaremos detalhadamente o efeito estrutura para a decomposição do índice de Gini, visto que nosso objetivo, assim como Brito (2015) fez para 1995-2011, é medir a contribuição do salário mínimo na distribuição de rendas entre 2012 e 2018.

Na tabela acima (tabela 11) trouxemos a decomposição detalhada para o efeito estrutura no índice de Gini. Cabe ressaltar que, novamente, devido a relativa estabilidade entre os subperíodos, alguns componentes da decomposição podem ter tido suas contribuições exageradas, não representando a sua real contribuição para o efeito estrutura. Portanto, analisaremos apenas os subperíodos 2012-2014, 2014-2016 (por conta da diferença entre 2016 e 2018 não ter sido significativa) e o período completo (2012-2018). Apesar desta relativa estabilidade, a desigualdade intra grupos afetou negativamente, isto é, o efeito estrutura contribuiu para reduzir a desigualdade em todos os subperíodos.

Quando olhamos para as faixas de salário mínimo para o período 2016-2018, observamos que para o efeito composição, apenas a faixa de até 0,5 SM contribuiu para reduzir a desigualdade, sendo a única faixa com efeito distributivo, o que não foi suficiente para reduzir a desigualdade como um todo, visto que foi a faixa com o menor peso dentre os ocupados, sendo a faixa de mais de 2 SM a com maior peso. Porém, para a desigualdade intra grupos, as faixas até 0,9 SM contribuíram para aumentar a desigualdade, isto é, tiveram um efeito concentrador. Enquanto para o efeito composição, as faixas mais importantes para reduzir a desigualdade foram a faixa exata do mínimo (0,9 a 1,1 SM) e a faixa de mais de 2 SM, para o efeito estrutura, as mais importantes foram as faixas de 1,5 a 2 SM (100,1%) e mais de 2 SM (574,4%). De 0 a 0,9 SM (isto é, as duas primeiras faixas), a desigualdade intra grupos cresceu, com maior relevância na primeira faixa (até 0,5 SM), com contribuição de 93% no aumento da desigualdade de rendas, seguida por 63,8% da faixa de 0,5 a 0,9 SM.

Diferentemente da desigualdade entre grupos (efeito composição), no qual a educação teve um efeito concentrador, esta teve um efeito distributivo na desigualdade intra grupos (efeito estrutura), contribuindo com 247,5% para a redução da desigualdade. Como a quantidade de pessoas com mais educação vem crescendo ao longo dos anos, estes têm se tornado mais homogêneos, com isso, reduzindo a desigualdade intra grupos. A variável idade (experiência) não foi significativa.

Já no caso das mulheres, assim como no efeito composição, também tiveram efeito distributivo no efeito estrutura, mostrando que estas estão se tornando mais homogêneas no mercado de trabalho, contribuindo para reduzir a desigualdade intra grupos. A variável dos não brancos também não foi significativa.

Para o período completo, o SM exato (0,9 a 1,1 SM) contribuiu em 48,3% no efeito estrutura para reduzir a desigualdade. No caso do efeito expandido do SM (0,5 a 1,5 SM), a contribuição foi de 29,6%. As variáveis que mais contribuíram para reduzir a desigualdade intra grupos foram a faixa de mais de 2 SM, educação e faixa de 1,5 a 2 SM, onde vemos que as faixas de SM foram as principais contribuintes.

Analisando os subperíodos, podemos ver que a constante foi consideravelmente alta, visto que quase não teve reduções da desigualdade nos períodos analisados. Esta constante pode estar absorvendo aspectos macroeconômicos que afetam os trabalhadores de forma igual. Entre 2012 e 2014 (primeira coluna da tabela 11), as faixas de 0,9 até mais de 2 SM foram responsáveis por reduzir a desigualdade intra grupos,

principalmente as faixas de mais de 2 SM e a faixa seguinte ao SM exato (1,1 a 1,5 SM), com 954,9% e 158,7%, respectivamente. Novamente vemos a forte influência da faixa de mais de 2 SM. Vemos também, que a faixa de até 0,5 SM teve um forte efeito (184,2%) para aumentar a desigualdade intra grupos.

Entre 2014 e 2016 (período em que o mínimo teve seu maior valor real e em que houve a maior redução da desigualdade), ocorreu o inverso do período anterior, com exceção das duas faixas inicias (até 0,5 SM e 0,5 a 0,9 SM), todas as faixas contribuíram para aumentar a desigualdade intra grupos, com a última faixa sendo a maior contribuinte para o aumento da desigualdade. Porém, como o efeito estrutura foi distributivo, a variável que mais contribuiu para a redução da desigualdade foi a educação (seguida pelas duas faixas iniciais), mostrando que, talvez, sua desigualdade intra grupos tenha diminuído bastante entre 2014 e 2016. Este efeito distributivo da educação no efeito estrutura foi o oposto do ocorrido no efeito composição, onde a educação teve um efeito concentrador, não só para este subperíodo mas como para o período completo. Por fim, podemos concluir que a desigualdade intra grupos (efeito estrutura) foi fortemente influenciada pelo desempenho das variáveis educação e pelas duas faixas superiores do SM, além da faixa inferior do SM (até 0,5 SM), esta última com efeito concentrador. No efeito composição, as duas faixas superiores do SM e as variáveis educação e idade tiveram efeito concentrador (isto é, contribuíram para aumentar a desigualdade de rendas), já no efeito estrutura, essas mesmas variáveis causaram o oposto, tendo efeitos distributivos (com exceção da variável idade que não foi significativa), contribuindo para reduzir a desigualdade e tornar a distribuição de rendas do trabalho mais igualitária.

VII. CONCLUSÃO

Nesta monografia, procuramos analisar o impacto que a política do salário mínimo teve na alteração da distribuição de rendas do trabalho principal entre 2012 e 2018, período seguinte ao analisado por Brito (2015), onde a autora analisou entre 1995 e 2011.

Para conseguirmos fazer tais análises, utilizamos a metodologia proposta por FFL (2009) de decomposição de Oaxaca-Blinder, que usa como variável dependente a função de influência recentrada (RIF) para outras estatísticas além da média (como Gini e percentis, aqui analisados), assim como foi feito em Brito (2015). Um dos resultados foi aplicar uma metodologia mais consistente para captar o impacto do salário mínimo na distribuição de rendas. Para estas decomposições, foram utilizados os microdados da PNAD Contínua.

Iniciamos com as alterações nos atributos dos ocupados com jornadas de pelo menos 40 horas por semana para cada subperíodo (2012-2014, 2014-2016 e 2016-2018), ou seja, as estatísticas descritivas. Algumas das mudanças ocorridas na formação dos trabalhadores foram o aumento do grau de educação, redução do peso de chefes de família, aumento do peso da mulher, aumento do peso do não branco e aumento do peso da formalização, além de aumento do peso do setor de educação e saúde e de alojamento e alimentação (setores que merecem maior destaque). Em relação as faixas de SM, o peso da faixa exata do SM (0,9 a 1,1 SM) diminuiu entre os ocupados enquanto o peso dos ocupados que ganharam mais de 2 SM foi a que mais aumentou.

Podemos traçar um paralelo entre nossos resultados e o cenário político e econômico no período. Já vimos nas estatísticas descritivas que a remuneração média em R$ de 2018 e a proporção de ocupados em alguns setores de atividades (como construção) caíram de 2014 para 2016 (tabela 3), além disso, ao olharmos para a tabela 4, vemos que o logaritmo da renda na média e nos percentis 10 e 50 também caíram de 2014 para 2016, tais reduções vão de acordo com a ocorrência da crise econômica no Brasil de 2014, a qual teve a contração da economia em 2015 e 2016 (-3,5% em 2015 e -3,3% em 2016) como uma de suas consequências, além de também ter gerado desemprego (auge em março de 2017, com da distribuição de rendas do trabalho principal entre 2012 e 2018, período seguinte ao analisado por Brito (2015), onde a autora analisou entre 1995 e 2011.

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Analisando agora a decomposição padrão de Oaxaca-Blinder, isto é, para a média do rendimento do trabalho principal, observamos que o aumento do peso dos ocupados recebendo mais de 2 SM foi o maior responsável pelo aumento da renda média, a educação, apesar de ter contribuído menos do que algumas faixas de SM, também foi um dos fatores que tiveram mais impacto no efeito composição, que serviu para aumentar a renda média, evidenciando que quanto maior o peso de ocupados com maior grau de escolarização, maior o aumento da renda média. Isso nos leva a acreditar que o mercado de trabalho tem se tornado menos acessível, diminuindo a proporção de pessoas com menores rendimentos. O fato de o efeito composição ter sido superior ao efeito estrutura mostra que esses componentes analisados foram os mais explicativos para os comportamentos da renda média no mercado de trabalho brasileiro no período analisado.

Olhando agora a decomposição do índice de Gini, apesar da pouca mudança ocorrida no período, vemos que o efeito composição (desigualdade entre grupos) serviu para concentrar a renda (aumentar a desigualdade), enquanto o efeito estrutura (desigualdade intra grupos), o qual foi superior ao composição, serviu para desconcentrar a renda (reduzir a desigualdade) entre 2012 e 2018. Ao olharmos para as variáveis do efeito composição, destacam-se algumas faixas do SM (até 0,5 SM, faixa exata do SM e acima de 2 SM), a educação e a idade. O aumento do peso da educação serviu para aumentar a desigualdade, assim como a idade e as faixas exata e acima de 2 SM, enquanto dentre as faixas do mínimo, apenas a inferior (até 0,5 SM) contribuiu para reduzir a desigualdade. O aumento do peso das mulheres e dos não brancos entre os ocupados também contribuiu para desconcentrar a renda, com os não brancos tendo mais impacto. A formalização não mostrou ter efeitos na desigualdade, pois talvez haja uma correlação entre a formalidade e as faixas de SM, outro ponto que também foi observado em Brito (2015).

Quanto aos percentis 10, 50 e 90, a renda dos ocupados aumentou nos três entre 2012 e 2018. Tanto para o 10º percentil quanto para o 50º percentil, ambos os efeitos, composição e estrutura, contribuíram para aumentar a renda (ainda que o efeito estrutura tenha contribuído mais), enquanto para o 90º percentil, apenas o efeito composição contribuiu para aumentar a renda, superando o efeito estrutura negativo. No efeito composição, as faixas do SM exato e de mais de 2 SM foram as que mais impactaram, servindo para aumentar a renda no p50 e p90, enquanto dentre essas duas faixas, apenas a de mais de 2 SM contribuiu para aumentar a renda no p10, o que, mais uma vez, pode ser explicado pelo considerável aumento do peso da faixa superior do SM. As variáveis educação e idade não parecem ter afetado muito o p10 e o p50, enquanto tiveram efeitos consideráveis no p90, indo de acordo com o fato de que educação e experiência (idade) aumentam a renda média e aumentam a desigualdade, isto é, concentram a distribuição de rendas.

Agora para as diferenças inter-quantílicas, apenas a diferença 90-10 se reduziu entre 2012 e 2018, com a diferença 50-10 sofrendo um aumento no mesmo período. Mesmo com a diferença 90-10 se reduzindo, o aumento do peso da educação contribuiu para aumentar este diferencial (ainda que tenha contribuído para aumentar o diferencial 50-10, mas com menor intensidade). Vemos também que a política do SM afetou mais o diferencial 90-10 (visto que seu efeito composição foi maior do que no outro diferencial). Apesar disso, vemos novamente que a parte não explicada (efeito estrutura) foi a que mais impactou a distribuição de rendas, sendo superior ao efeito composição em ambos os diferenciais.

Evidenciando a variável da educação, vemos que no efeito composição ela contribuiu para aumentar a renda média e aumentar a desigualdade da distribuição de renda mensurada pelo índice de Gini e pelo diferencial 90-10. Porém, para o efeito estrutura, a educação teve o efeito oposto, contribuindo para reduzir a desigualdade captada pelo Gini. Isso indica que o aumento do grau de escolaridade no Brasil tem contribuído para reduzir a desigualdade intra grupos (efeito estrutura) e aumentar a desigualdade entre grupos (efeito composição). A educação teve um efeito total (isto é, composição e estrutura) distributivo de 131,6% no período 2012-2018.

Ao analisarmos ambos os efeitos composição e estrutura para a faixa de mais de 2 SM (a faixa com maior peso entre os ocupados e, consequentemente, a que mais impactou nas decomposições), vemos que esta teve um fortíssimo efeito distributivo na distribuição de rendas do trabalho (525,8%) entre 2012 e 2018.

Seguindo o raciocínio acima (feito para educação e faixa de mais de 2 SM), ao olharmos para a posição de ocupados nas faixas de SM e considerarmos que o efeito direto da política de salário mínimo, assim como em Brito (2015), é captado pela faixa de 0,9 a 1,1 SM, observamos um efeito concentrador de -86,5% do SM entre 2012 e 2018, onde -134,8% são do efeito composição e 48,3% do estrutura. Entretanto, ao considerarmos um efeito expandido do SM (0,5 a

1,5 SM), ou seja, considerando também possíveis *spillovers* do salário mínimo e efeitos de numerário, o efeito seria concentrador em -109,7%, dos quais -139,3% são do efeito composição e 29,6% são do efeito estrutura. Uma possível explicação para os possíveis efeitos de *spillover* e numerário envolvendo as faixas de 0,5 a 0,9 SM (faixa anterior ao SM exato) e 1,1 a 1,5 SM (faixa seguinte ao SM exato) é a ocorrência de um aumento no peso dos ocupados na faixa anterior ao SM exato e uma redução no peso na faixa seguinte, ainda que estes aumentos e reduções não tenham sido muito altos.

Este resultado foi o oposto do encontrado por Brito (2015) para o período 1995-2011 (pois, não só a valorização do SM foi bem maior que entre 2012-2018, mas o SM também teve uma perda do seu papel distributivo), onde tanto o efeito direto quanto o efeito expandido do salário mínimo contribuíram para reduzir a desigualdade, tendo efeito desconcentrador na distribuição da renda. A diferença foi que, entre 1995 e 2011, o efeito composição de ambos os efeitos do SM (direto e expandido) foi distributivo, já entre 2012 e 2018, o efeito composição foi concentrador. Isso deixa claro que as diferenças entre grupos pesaram mais do que as diferenças intra grupos, afetando negativamente a distribuição de rendas.

Assim sendo, podemos chegar à conclusão de que o salário mínimo teve um impacto importante no comportamento da distribuição de rendas do trabalho principal entre 2012 e 2018, ainda que ambos os efeitos do SM, direto e expandido, tenham sido concentradores. Isto porque a pequena valorização do salário mínimo, se comparada ao período analisado por Brito (2015), foi acompanhada pela redução do peso da faixa exata do salário mínimo na distribuição de rendimentos do trabalho e pelo aumento da faixa acima de dois salários mínimos, o que pode ter enfraquecido seu potencial de aumentar a renda da base da distribuição. Observando os subperíodos, vemos que o salário mínimo, em geral, teve um efeito distributivo principalmente entre 2016 e 2018, enquanto no período 2014-2016 seu efeito foi concentrador. Entre 2014 e 2016, a redução da renda na cauda inferior junto com o aumento da renda na cauda superior não contribuiu para diminuir a desigualdade, já para o período 2016-2018, apesar da evolução positiva da cauda superior, a evolução também positiva da cauda inferior contribuiu para reduzir a desigualdade.

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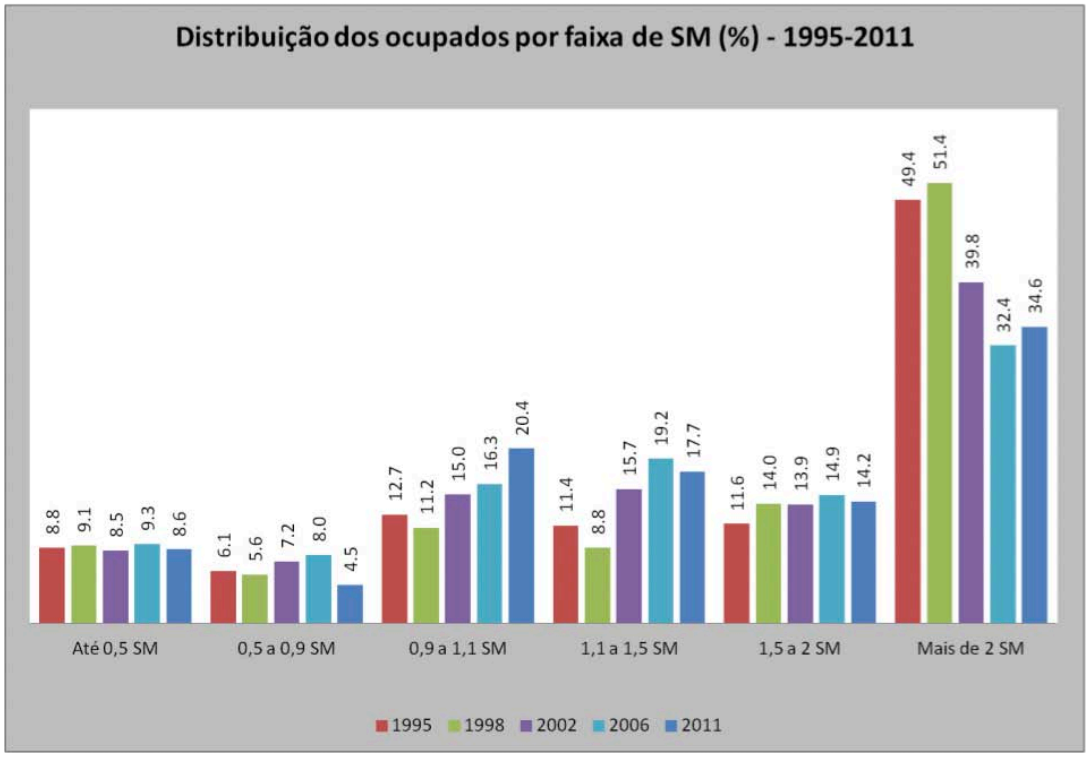
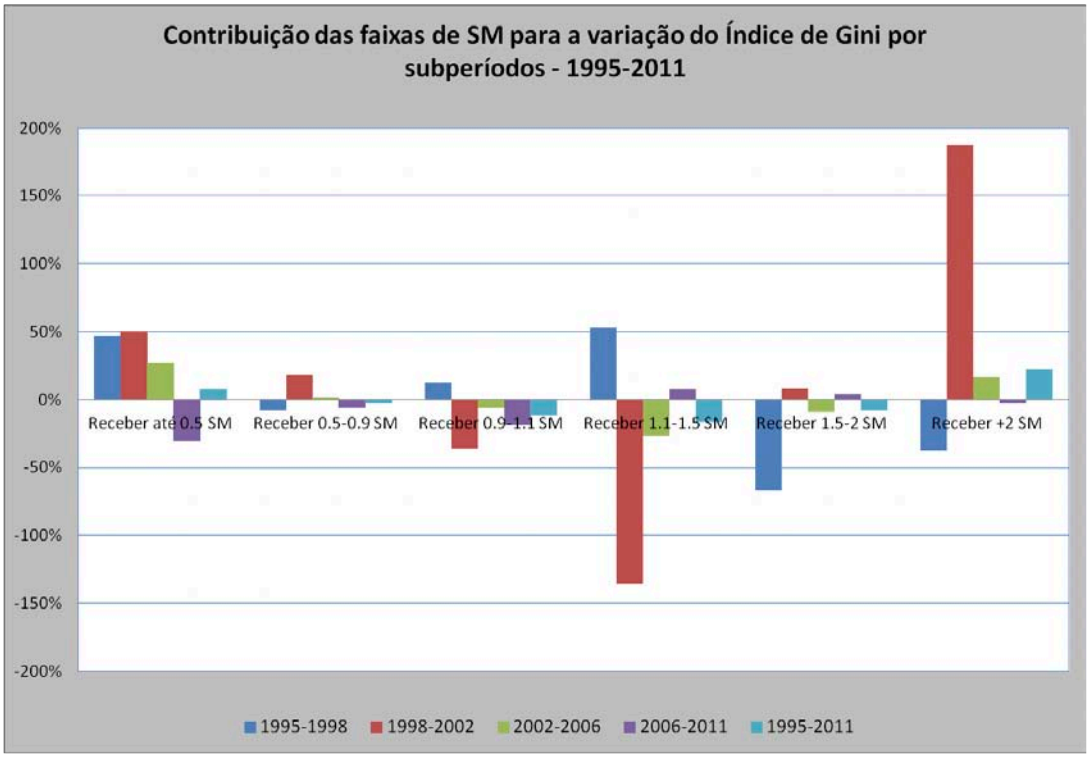
ANEXO



Fonte: Brito (2015, p. 58)



Fonte: Brito (2015, p. 71)

Figura 2A

Tabela 1A: Variação (em pontos percentuais) da proporção em cada subperíodo 2014-2012 2016-2014 2018-2016

	2014-2012	2016-2014	2018-2016
Faixa de SM			
Até 0,5 SM	-1,1	0,9	-0,2
0,5 a 0,9 SM	-0,5	2,1	-1,1
0,9 a 1,1 SM	-0,6	-4,7	2,0
1,1 a 1,5 SM	1,6	2,7	-4,4
1,5 a 2 SM	-3,2	2,5	0,0
Mais de 2 SM	3,7	-3,3	3,7
Escolaridade			
Menos de 1 ano	-0,3	-0,1	-0,9
De 1 a 3 anos	-0,4	-0,5	-1,3
De 4 a 7	-1,2	-1,6	-0,2
De 8 a 10	-0,2	-1,6	-1,0
11 e mais	2,1	3,8	3,4
Região			
CO	0,0	-0,1	0,4
NE	0,7	-0,6	-0,9

Norte	0,4	0,0	0,1
SE	-0,7	0,3	0,2
Sul	-0,4	0,4	0,1
Dummies			
Chefe da família	0,2	0,8	-1,9
Mulher	0,2	1,1	0,6
Não branco	0,9	0,9	1,2
Formal	1,3	0,5	-1,2
Setor de Atividade			
Agricultura	-0,3	0,3	-0,5
Indústria geral	-0,3	-1,9	-0,3
Informação, comunicação e atividades financeiras	0,5	-0,5	0,8
Construção	-0,2	-1,0	-1,3
Comércio e reparação	-0,2	0,0	0,0
Alojamento e alimentação	0,2	0,5	0,5
Transporte, armazenagem e correio	-0,1	0,3	0,1
Administração pública, defesa e seguridade social	0,1	-0,3	0,0
Educação, saúde e serviços sociais	0,7	1,9	0,4
Serviços domésticos	-0,5	0,5	-0,2
Outros serviços	0,0	0,3	0,3
Outros	0,0	0,0	0,0

Faixa de SM

Tabela 2A: Estatísticas descritivas

Variáveis	2012			2014			2016			2018		
	N	%	DP	N	%	DP	N	%	DP	N	%	DP
Faixa de SM												
Ate 0,5 SM	123386	7,3	0,26	131302	6,3	0,24	124787	7,1	0,26	116845	6,9	0,25
0,5 a 0,9 SM	123386	6,6	0,25	131302	6,0	0,24	124787	8,1	0,27	116845	7,0	0,26
0,9 a 1,1 SM	123386	23,4	0,42	131302	22,8	0,42	124787	18,1	0,38	116845	20,1	0,40
1,1 a 1,5 SM	123386	16,7	0,37	131302	18,3	0,39	124787	21,0	0,41	116845	16,5	0,37
1,5 a 2 SM	123386	16,2	0,37	131302	13,1	0,34	124787	15,5	0,36	116845	15,5	0,36
Mais de 2 SM	123386	29,8	0,46	131302	33,5	0,47	124787	30,2	0,46	116845	33,9	0,47
Escolaridade												
Menos de 1 ano	123386	3,9	0,19	131302	3,6	0,19	124787	3,5	0,18	116845	2,6	0,16
De 1 a 3 anos	123386	6,2	0,24	131302	5,8	0,23	124787	5,3	0,22	116845	3,9	0,19
De 4 a 7	123386	21,6	0,41	131302	20,4	0,40	124787	18,9	0,39	116845	18,7	0,39
De 8 a 10	123386	18,1	0,38	131302	17,9	0,38	124787	16,3	0,37	116845	15,2	0,36

11 e mais	123386	50,2	0,50	131302	52,3	0,50	124787	56,1	0,50	116845	59,6	0,49
Região												
CO	123386	11,5	0,32	131302	11,6	0,32	124787	11,4	0,32	116845	11,9	0,33
NE	123386	25,4	0,44	131302	26,1	0,44	124787	25,5	0,44	116845	24,6	0,43
Norte	123386	11,9	0,32	131302	12,3	0,33	124787	12,3	0,33	116845	12,4	0,46
SE	123386	30,6	0,46	131302	29,8	0,46	124787	30,2	0,46	116845	30,4	0,41
Sul	123386	20,6	0,40	131302	20,2	0,40	124787	20,6	0,40	116845	20,7	0,32
Dummies												
Chefe da família	123386	51,1	0,50	131302	51,3	0,50	124787	52,1	0,50	116845	50,1	0,50
Mulher	123386	33,6	0,47	131302	33,9	0,47	124787	35,0	0,48	116845	35,6	0,48
Não branco	123386	53,8	0,50	131302	54,7	0,50	124787	55,6	0,50	116845	56,8	0,50
Formal	123386	82,8	0,38	131302	84,1	0,37	124787	84,6	0,36	116845	83,5	0,37
Setor de Atividade												
Agricultura	123386	13,9	0,35	131302	13,5	0,34	124787	13,8	0,35	116845	13,3	0,34
Indústria geral	123386	15,4	0,36	131302	15,2	0,36	124787	13,3	0,34	116845	13,0	0,34
Informação, comunicação e atividades	123386	9,1	0,29	131302	9,5	0,29	124787	9,0	0,29	116845	9,8	0,30
Construção	123386	10,1	0,30	131302	10,0	0,30	124787	9,0	0,29	116845	7,7	0,27
Comércio e reparação	123386	21,0	0,41	131302	20,8	0,41	124787	20,8	0,41	116845	20,8	0,41
Alojamento e alimentação	123386	4,1	0,20	131302	4,3	0,20	124787	4,9	0,21	116845	5,4	0,23
Transporte, armazenagem	123386	5,0	0,22	131302	5,0	0,22	124787	5,3	0,22	116845	5,4	0,23
Administração pública, defesa e seguridade social	123386	6,2	0,24	131302	6,3	0,24	124787	6,0	0,24	116845	6,0	0,24
Educação, saúde e serviços sociais	123386	6,6	0,25	131302	7,3	0,26	124787	9,2	0,29	116845	9,6	0,29
Serviços domésticos	123386	5,2	0,22	131302	4,7	0,21	124787	5,2	0,22	116845	5,0	0,22
Outros serviços	123386	3,3	0,18	131302	3,4	0,18	124787	3,6	0,19	116845	3,9	0,19
Atividades mal definidas	123386	0,1	0,02	131302	0,0	0,01	124787	0,0	0,01	116845	0,1	0,02

Fonte: PNAD Contínua. Elaboração própria

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