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CROWDING-OUT EFFECT BETWEEN INCOME POLICIES AND PUBLIC SERVICES BUDGETS IN OECD COUNTRIES

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ABSTRACT

Challenges such as globalization and the digital economy are affecting the labor market and causing social exclusion. Thus, the relevance of income policies, which are responsible for the citizens' financial security, is understood. This study aimed to evaluate the budget expansion of income policies between 1970 and 2019 and verify if there is a crowding-out effect between their budget and public services from 2000 to 2019 in OECD countries. The theoretical framework addressed the welfare state, income policies, budget disputes and austerity, and the crowding-out and crowding-in (complementarity) effects. Methodologically, descriptive and graphical analyses, correlation analyses, Granger causality tests, and GMM system short panel regression were used. The results indicated an expansion of income policy budgets, emphasizing investments in social security and pension systems. Also, a mixed relationship was observed between the acceptance of the crowding-out hypothesis and income policies and public services, with a tendency to exclude public services for expansion in income policies. Limitations were observed due to the lack of some data from the broad database used.

Keywords: Income Policies. Welfare State. Social Protection. Public services. OECD.

1 INTRODUCTION

The 21st century has marked the resumption of the expansion of serious global problems, such as social inequalities and economic exclusions. Some reasons are highlighted: neoliberal recovery and labor precariousness resulting from globalization and the digital economy (Banerjee & Duflo, 2020; Bresser-Pereira, 2017; Hemerijck, 2017; Khoma & Vdovychyn, 2020; Piketty,

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2014). The Organisation for Economic Co-operation and Development (OECD) has also diagnosed this scenario and created proposals to combat economic inequalities and distortions (OECD, 2021).

In this context, the welfare state, which works on the assumption that the state must provide guarantees of a dignified life and security through public investment in social policies, is again part of the political debate (Draibe & Riesco, 2011; Kerstenetzky & Guedes, 2018; Piketty, 2014), with the generation of financial security for the citizen being the function of the welfare state (Carvalho, 2020; Hemerijck, 2017). Therefore, public income policies, which are responsible for providing financial resources to citizens, such as retirement and pension, conditional cash transfer, and unemployment benefits, are relevant.

Noel (2019) mentions, however, that there is little empirical research on income policies, which are, to some extent, neglected by welfare state scholars. In existing studies, some results oppose the importance of public investment in income policies (Khoma & Vdovychyn, 2020; Martinelli, 2020; Saraceno et al., 2020; Wispelaere & Stirton, 2017).

Also, Banerjee and Duflo (2020) and Kim and Choi (2020) have been talking about alleged budget disputes within the scope of the States, and income policies can, for their consolidation, withdraw resources from public services or even make more beneficial policies to promote development unfeasible. Thus, there may be a crowding-out effect, which understands that for a budget to grow, another needs to reduce. This analysis is more evident in the face of the austerity scenario that is based on the need for investment cuts or tax reforms to generate development (Rossi et al., 2018).

Given the above, the objective is to present the temporal advance of the income policy budget between 1970 and 2019, considering the neoliberal expansion from the 1970s and the technological change of the beginning of the 21st century, and analyze whether there is a crowding-out effect between income policy budgets and social investments in public services, such as education and health, from 2000 to 2019, in OECD countries. All this built from graphical analysis and quantitative assessments, with causality checks and regressions.

Castles (2005) and Kautto (2002) developed similar research on income policies and public services, but still with data from the 1990s and a few countries. With this article, it is possible to cover a broad period (1970-2019) and include more countries, given the expansion of OECD member or partner countries. One of them is Brazil, a country that in the early 2000s expanded the Family Allowance Program (Bolsa Família), a major conditional cash transfer policy, and experienced austerity actions on social rights, such as social security reforms, as well as valuations and cuts in education and health systems (Botelho et al., 2020; Carvalho, 2020; Salvador, 2017).

2 THEORETICAL BACKGROUND

2.1 Welfare State and Public Income Policies

The welfare state represents a universal social protection system based on the social action and economic intervention of the state (Esping-Andersen, 1990). This organization had its first successful formation in England in 1942, with a state plan based on *Keynesian-Beveridgian* policies to assist societies in post-war social complexities periods (Esping-Andersen, 1990).

At the beginning of the 21st century, groups of scholars emerged, proposing a new welfare state (Esping-Andersen, 2002; Hemerijck, 2017). There is a change in interpretation of the application of public resources, which is now considered social investment aligned with socioeconomic development (Draibe & Riesco, 2011). Moreover, in order to adapt the model to different economic and labor realities, which involves globalization and technological and digital extension, the new welfare state established three pillars of welfare:

(1) easing the 'flow' of contemporary labour-market and gendered life-course transitions; (2) raising the quality of the 'stock' of human capital and capabilities; and (3) maintaining strong minimum-income univêrsal safety nets as social protection and economic stabilization 'buffers' in ageing societies(Hemerijck, 2017).

Pillar (1) shows the need for income policies such as social security and unemployment benefits, supporting society in contexts of labor difficulty. Pillar (3) shows the ambition for conditional and unconditional cash transfer policies, focusing on social protection and investment. Pillar (2) addresses the importance of social investment in education and capacity generation.

As can be seen, there was a strengthening of the understanding of the relevance of public income policies (pillars 1 and 3), which are fundamental for maintaining the financial security of citizens, which, in the view of (Carvalho, 2020; Hemerijck, 2017), is the mission of the welfare state.

It is understood that income policies play a fundamental role in providing income redistribution and public services, such as education and health, which function as policies for material redistribution of income (Rossi et al., 2018). Besides, Parijs and Vanderborght (2018) indicate that income policies have the greatest potential to mitigate the high economic insecurities and social exclusions of the 21st century. A great example was observed based on the results of Emergency Income in Brazil during the Covid-19 pandemic (Gonzalez & Barreira, 2020). Suplicy (2004) points out that the availability of cash resources via income policies is the most efficient design to generate citizenship since the degree of freedom provided allows families to choose how to address their main nuisances and promote capacities.

The types and objectives of income policies are summarized in Table 1 below.

Table 1

Types of Income Policies and their Objectives

Policies	Means	Purposes	Authors
Unconditional income.	Universal Basic Income (UBI) available to the whole society.	Poverty alleviation, social protection, social investment, and economic momentum.	Carvalho (2020); Martinelli (2020); Noel (2019); Banerjee and Duflo (2020); Saraceno et al. (2020).
Conditional income.	Cash transfer policies conditioned on welfare exercises (for example, supporting children's education and health).	Breaking the intergenerational cycle of poverty, poverty mitigation, social protection, social investment, and economic momentum.	Banerjee and Duflo (2020); Carvalho (2020); Pase and Melo (2017); Roque and Ferreira (2015).
Income linked to work disability.	Social security, social assistance, and unemployment benefit.	Poverty alleviation, social protection, and economic momentum.	Kim and Choi (2020) and Botelho et al. (2020).

Source: Prepared by the authors.

Subsequently, the economic and budgetary context around public income policies are discussed.

2.2 Need for Resources, Budget Disputes, and Austerity

Unlike the budgetary need to implement Universal Basic Income (UBI) policies, which involve more complex debates on financial viability, policies of assistance in labor difficulty and

conditional transfer do not require major tax changes and, even so, face resistance, mainly due to the imposition of budget substitutions and policies of tax and austerity reforms.

Analyzing budget disputes in OECD countries, Castles (2005) identified, between 1990 and 2001, the migration of income transfers to investments in public services, especially in the face of social security reforms. Also evaluating redistribution strategies between income policies and/or public services, Kautto (2002) reports, as well as Castles (2005), that in the 1990s, there were expansions in services for Western European countries, over income policies due to the needs of welfare states to apply in health, in a context of population aging. Busemeyer and Garritzmann (2017), observing the effect of globalization on the actions of the welfare state in OECD countries, argue that social investments in services, such as education, have been more demanded by society than income policies, such as unemployment benefits.

Regarding tax reforms and neoliberalism, from 1970, after the period of valuation of the post-war welfare state, restrictions on social policies expanded again (Bresser-Pereira, 2018; Kerstenetzky & Guedes, 2018; Piketty, 2014). Regarding neoliberalism, Paterson (2015) emphasizes that, in addition to the free market, it is always in the process of evolution, seeking, based on new regulations, to maintain the dominance of capital over labor. It seeks to include the private agent in sectors previously controlled by the State and to strengthen public agendas of reformist actions disciplined by the market.

Considering the temporal and evolutionary character of neoliberalism, the idea of austerity is present in the new phase of neoliberal expansion, in addition to the notions of liberalization of markets and privatizations (Rossi et al., 2018). Blyth (2017) classifies austerity as "a form of voluntary deflation in which the economy adjusts through the reduction of wages, prices, and public spending in order to restore competitiveness which is (supposedly) best achieved by cutting the state's budget [...]". However, the results are: (i) recession and unemployment and rising social inequalities, (ii) tax cuts, and (iii) expansion of private services in education and health.

Assuming that income policies are important in the context of the global and digital labor market, two hypotheses are tested for this study:

(1) Even in the face of austerity policies, public income policies showed budgetary expansion in their use in OECD countries between 1970 and 2019;

(2) The implementation of public income policies does not result in a reduction in public service budgets when one observes data from 2000 to 2019, a period of increasing globalization and technological and digital economy.

To test Hypothesis (2), the crowding-out effect economic method will be used. Next, therefore, similar studies are briefly demonstrated.

2.3 Crowding-out and Crowding-in Effect

The crowding-out effect is a method for econometric analysis that predicts interdependence between government budget categories in financing social investments, understanding that when one budget grows, another decreases (Kim & Choi, 2020). In contrast, the crowding-in effect argues that two budgets can grow simultaneously, while there may be idle, misused resources or investment growth in the economy (Fernandez et al., 2018).

Fernandez et al. (2018) evaluated whether there was a crowding-out effect in Brazil between public and private investments between 1995 and 2014. The conclusion is that there was a crowding-in effect in the long term. In other words, public and private investments were complementary. Also, analyzing economic investment, Farla, De Crombrugghe, and Verspagen (2016) used the crowding-out effect to identify the influence of foreign investments on domestic investments and the role of governance in this relationship.

Through the crowding-out effect, Hossain (2014) investigated whether income transfer policies can prevent workers' commitment to the labor market. The experiment indicated that there

is no crowding-out effect when there is quality and regularity in the work, with motivation for work prevailing. Finally, evaluating whether there is a crowding-out effect between budgets for the creation of daycare centers and older-adult policy in OECD countries, Bonoli and Reber (2010) concluded that there is such an effect, which is justified by the greater ease in creating new investments for early childhood education since public policies for older adults face the budgets already allocated to social security and pension systems.

3 METHODOLOGY

This article is characterized by a quantitative research approach and uses analytical techniques.

3.1 Data Collection and Description of Variables

Secondary data on social benefits in income and cash, predominantly in education and health services, made available by the OECD, an organization that encompasses 43 countries, were collected, as shown in Table 2 below, favoring the broad analysis aimed in this study.

Table 2

OECD countries covered by the study

Member Countries		Member Countries		Member Countries	
Region	*Country*	*Region*	*Country*	*Region*	*Country*
Oceania	Australia	Europe	Latvia	North America	Canada
	New Zealand		Portugal		United States
Europe	Austria		Lithuania	Asia	Israel
	Belgium		Luxembourg		Japan
	Czech Republic		The Netherlands		Korea
	Denmark		Norway		
	Estonia		Slovak Republic		
	Finland		Slovenia	**Participating Countries**	
	France		Spain	Region	Country
	Germany		Sweden	Central America	Costa Rica*
	Greece		Switzerland	South America	Brazil
	Hungary		Italy	Africa	South Africa
	Iceland	Central America	Mexico	Asia	Indonesia
	Ireland	South America	Chile		China
	Poland		Colombia		Russia*
	United Kingdom		Peru		

*They are not members or participants but have data in the OECD survey.
Source: Prepared by the authors.

Information on disaggregated income, retirement and pension, conditional cash transfer, and unemployment benefit policies was also used. Table 3 describes the origin and period of the data used. The analyses of the different income policies are essential in understanding the most significant changes in the period under assessment.

Table 3
Description of variables

Variable	Code	OECD Study	Description	Period
General income policies	IncomeP	Social benefits for families, in cash.	Cash transfer for different purposes. In percentage of the Gross Domestic Product (GDP) of each country and according to the data available for each year.	1970-2019
Public services	PService	Social benefits for families, in cash.	Public investments to provide goods or services. In percentage of the Gross Domestic Product (GDP) of each country and according to the data available for each year.	1970-2019
Retirement and pension	R&P.	Investments with pension.	Benefits related to old age. In percentage of the Gross Domestic Product (GDP) of each country and according to the data available for each year.	1980-2017
Unemployment benefit	UnempBen.	Public investments with unemployment.	Unemployment benefit. In percentage of the Gross Domestic Product (GDP) of each country and according to the data available for each year.	1980-2017
Conditional cash transfer	C.Transf	Family benefited from public investments, in cash.	Cash transfers to support investment in education and health and tax exemptions. In percentage of the Gross Domestic Product (GDP) of each country and according to the data available for each year.	1980-2017

Source: Prepared by the authors, based on OECD (2021).

This study also uses control variables for the statistical tests and econometric assessments, which are available in Table 4.

Table 4
Control variables

Variable	Code	Description	Period	Theoretical Relationship
Unemployment	WUnempl.	This indicator is measured in the number of unemployed people as a percentage of the workforce.	2000-2019	Unemployment levels are associated with social protection expenditures, such as unemployment benefits.
Demography	AAP	The active age population is defined as those aged between 15 and 64.	2000-2018	The demographic condition is related to income policies, especially concerning social security and pension systems. Health services, for example, are also affected.

Source: Prepared by the authors, based on OECD (2021).

Subsequently, the operationalization of the variables presented is addressed, with purposes in the objectives and hypotheses of this study.

3.2 Operationalization of Results

To test Hypothesis 1, descriptive and graphical analyses are performed, aiming to observe the variations of the data over time. It is important to note that the data on public income policies and public services are currently presented based on the means of the percentages of GDPs invested by OECD countries. To evaluate Hypothesis 2, statistical and econometric tests are then performed for panel data, and panel assessments comprise the combination of analyses with temporal data from 2000 to 2019 and spatial data from 43 OECD member countries (*cross-section*).

In this study, the crowding-out econometric evaluation follows the paths traced by Kim and Choi (2020) from four stages: (1) Descriptive Statistical Analysis (DSA), (2) Correlation Analysis, (3) Granger Causality Test for panel data, and (4) Short panel regression, in the case of this article with the Generalized Method of Moments (GMM System*)*, to observe the robustness of the results.

DSA seeks to understand the behavior of variables before applying or adapting them. In the DSA, the Kolmogorov-Smirnov and Shapiro-Wilk normality tests are performed, refuting the distributions' normality from significance levels below 0.05. Spearman's correlation test (for non-parametric variables) aims to quantify the associations between two variables. Correlations with coefficients greater than 0.5 are considered relevant.

Granger causality test works based on predictive relationships, in which the past can affect the present and the future, between two variables for panel data. Therefore, this test represents an evolution of correlation tests in which the relationship of present and past values of variables is used (Granger, 1969). Causalities or predictions are found in tests with significance levels less than 0.05. For the acceptance of Hypothesis 2, it is expected to find bidirectional causality, with public services causing public income policies and income policies causing public services.

In this study, the Granger causality test is also used based on the method developed by Dumitrescu and Hurlin (2012) for heterogeneous panel data, which is interesting for cross-country comparisons due to the possibility of individual causality observations by country. It is important to note that this model requires that the data be balanced, which resulted in the need to remove some countries.

Panel regression favors the association between a dependent variable and independent variables. The use of the dynamic panel by the GMM short panel model is relevant when one is not sure about the normality of the data distributions and if endogeneity (existence of a correlation between the dependent variable and the error) is possible, which is common in economic data (Silva & Cabral, 2021).

To solve the previous difficulties, lags are applied to the dependent and independent variables (Arellano & Bond, 1991). It is vital to highlight that the GMM system short panel model was applied, seeking to minimize biases and present more efficient estimates, an improvement developed by Blundell and Bond (1998) for the GMM method.

To evaluate Hypothesis (2), Equation (1) is presented below, which includes the main variables of the study, *IncomeP* being the dependent variable and the *PService* the independent variable, as well as the control variables:

$$(1) \quad \text{IncomeP}_{it} = \alpha i + \beta_1 \text{IncomeP}_{it-1} + \beta_2 \text{PService}_{it} + \beta_3 \text{WUnempl}_{it} + \beta_4 \text{AAP}_{it} + e_{it}$$

It is also noteworthy that the GMM system was estimated in one stage, with control of instrument excesses (STATA "*collapse*" command), adjustment for small samples (STATA "*small*" command), and orthogonal deviations (STATA "*orthogonal*" command), as did Silva and Cabral (2021) (Roodman, 2009).

Regarding the assessment of the model results, the value given by the coefficients of the variables is interpreted; the *p-value (prob>f)*, which analyzes the significance of the model as a whole, and the *p-value (prob >t)* for each variable of the model, both with results below 0.05.

Furthermore, it is crucial to verify the Hansen test, which analyzes the validity of the instruments for non-correlation with the error term and exclusion of endogenous variables, which should present a *p-value* greater than 0.05, and the *Arellano and Bond* test of serial autocorrelation, responsible for observing first and second order autocorrelations, requiring the presence of first-order autocorrelation (*p-value* less than 0.05) and absence of second order autocorrelation (*p-value* greater than 0.05).

Finally, in this study, also within the scope of the associations between public income policies and public services, the alignments and exclusions are evaluated by graphical analyses between 2010 and 2019 in a regionalized manner, according to the availability of data, either by region, continent, or country.

4 RESULTS AND DISCUSSION

4.1 Temporal Progress of the Public Income Policies Budget in OECD Countries: 1970 to 2019

Data from the 1970s is limited, with only information from 5 countries (Australia, Finland, France, Korea, and the United States of America). However, as shown in Figure 1, from 1970 to 1979, the mean percentage of GDP applied by the countries described in income policies grew from 3.52% to 8.36%, which represented the most significant expansion for the five decades studied (137.50%), with the reservation that the reduced scope of analysis facilitates the expansion of the mean, as well as the inclusion of data from Finland in 1975 and France only in 1978, the latter representing the most significant percentage of GDP for income policies in the period (approximately 15%).

Figure 1
Temporal evolution of public income policies in OECD countries
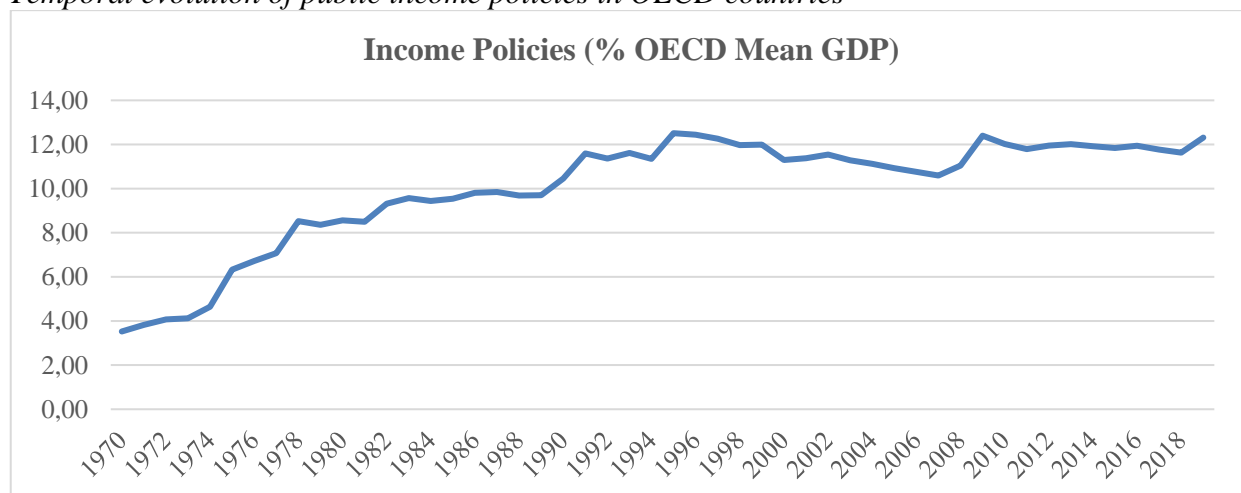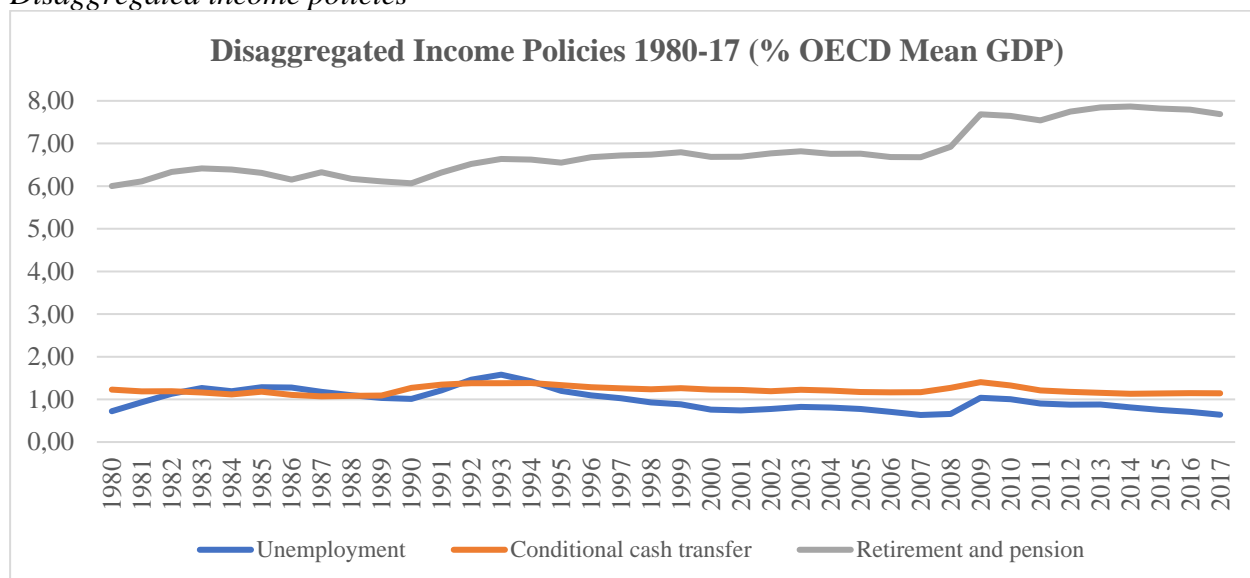

Source: OECD.

The scenario of strengthening neoliberalism in the period may have contributed to the rates of public investment in relatively low-income policies for the period (Hemerijck, 2017; Piketty, 2014). Also, the demographic conditions of population aging, which mainly reinforce the need for social security and pension programs, have expanded a lot since then. The scenario was not different for the period between 1980-1994, with data for nine countries indicating an expansion as a percentage of GDP of 32.59%, highlighting the increase in investment in Finland and the inclusion and expansion of investments made by the United Kingdom and Canada.

As of 1995, the scope of analysis with OECD countries gained a lot of potential since the assessment now covers all 43 countries of the organization. As pointed out by Castles (2005) and Kautto (2002), there are decreases in the percentage of GDP on investments in income policies, from about 12% of GDP in 1994/1995 to 10% in 2005/2006. The austere context and possible replacement by applications in public services can be plausible explanations (Castles, 2005; Kautto, 2002; Khoma & Vdovychyn, 2020; Kim & Choi, 2020; Rossi et al., 2018).

After 2007, on the other hand, a change of direction in terms of investment and social protection by income policies is visible. There was an increase in the percentage of GDP to a position close to the mean seen in 1994/1995, and this level of approximately 12% of GDP was maintained until 2019. In response to H1, it can be argued that there was budget expansion in 1970 and 2019 in OECD countries.

According to Castles (2009), the importance of income transfer policies, and Pase and Melo (2017), the evolution of conditional cash transfer policies could be affirmed by valuing these policies in the period. However, Noel (2019) argues that complex economic circumstances have affected investments in income transfer policies. Thus, it is relevant to verify income policies in OECD countries in a disaggregated manner, as shown in Figure 2.

Figure 2
Disaggregated income policies

Source: OECD.

It appears that the expansion in the application of public income policies, from 2006, had a greater link with social security and pension policies, while there was a slight reduction in unemployment benefits and maintenance of the percentage of GDP invested in income transfer policies. Population aging, austerity measures, and economic complexities can be explanations (Castles, 2005; Noel, 2019; Rossi et al., 2018). Besides, there is a possibility of internal disputes between income policies, with the expansion of social security and pension policies limiting the others (Bonoli & Reber, 2010; Banerjee & Duflo, 2020).

The prioritization of investments in public services over income policies, discussed by Busemeyer and Garritzmann (2017) in the contemporary panorama of globalization and the digital economy, may influence these results. Thus, the crowding-out effect between income policies and public services is addressed between 2000 and 2019, a period that was not covered in Castles (2005) and Kautto (2002).

4.2 Crowding-out Effect Between Public Income Policies and Public Services

Table 5 shows the characteristics and behaviors of the variables used in this study to analyze the crowding-out effect on income and public service policies between 2000 and 2019.

**Table 5**
Exploratory Data Analysis (EDA)

Variables	Obs.	Minimum	Maximum	Mean	Standard deviation	Kurtosis	Asymmetry	Normality
IncomeP	794	1.45	20.62	11.71	4.70	-0.71	-0.35	No
PService	722	4.54	19.39	11.06	3.16	-0.04	0.34	No
WUnempl.	709	1.90	27.65	7.65	4.05	4.22	1.79	No
AAP	817	59.70	73.80	66.79	2.57	0.29	0.23	No

Source: Prepared by the authors.

Although the variables IncomeP and PService present measures of kurtosis and asymmetry close to zero, the high standard deviations indicate dispersions of the distributions. The WUnempl. variable has a high standard deviation and a kurtosis measurement and asymmetry far from zero. In this context, all variables, except AAP, indicate non-normality in the distributions, confirmed by the Kolmogorov-Smirnov and Shapiro-Wilk tests, which also stated non-normality for the AAP indicator.

Continuing the analysis of the results, Figure 3 shows the temporal expansion of the relationship between social investments in income policies and public services between 2000 and 2019 by the mean of OECD countries.

Figure 3
Income policies and public services
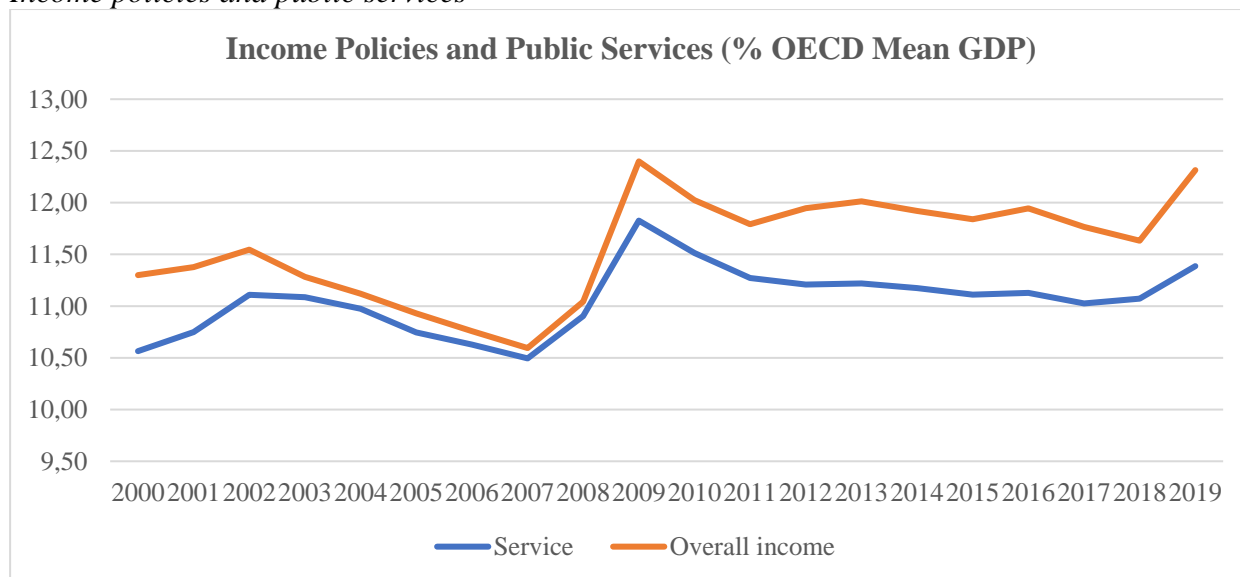
Source: OECD.

By the mean of the percentages of GDP applied by the 43 OECD countries indicated in Figure 3, it is evident that, at first, there is a proximity between the movements for both variables. This situation is opposite to that verified by Castles (2005) and Kautoo (2002) for OECD countries in the 1990s and Busemeyer and Garritzmann (2017) in the 2000s, who pointed to the expansion of services over income. Thus, to evaluate Hypothesis (2), which seeks to 'analyze whether there is a crowding-out effect between income policy budgets and social investments in public services,

such as education and health, from 2000 to 2019 in OECD countries', the Crowding-out effect test was conducted, starting with correlation tests, such as Kim and Choi (2020).

Table 6 shows the results of the correlations between the variables Public Services (PService) and Public Income Policies (IncomeP) per decade of analysis. It is important to report that from this moment on, the means of the OECD countries are no longer used, as in item 4.1 and the beginning of 4.2. However, all the observations for the 43 countries in the 20 years of assessment make the statistical diagnosis more reliable.

Table 6

Pearson's Correlations between PService and IncomeP by Period

Spearman's correlation	2000–2009	2010–2019	2000–2019
PService & IncomeP	0.473**	0.399**	0.396**
	0.000	0.000	0.000

**Significant correlation at the confidence level of 0.01;
Source: Prepared by the authors.

There is a direct and median relationship between both social investments, as the general correlation (2000-2019) indicates Crowding-in. Still, a loss of this strength can be observed in the last decade, which may represent a Crowding-out trend. However, only the previous results are insufficient for this study's intended confirmations. Thus, the results of the Granger causality tests are discussed next.

Table 7

Granger causality between PService and IncomeP by period.

Granger Causality		2000–2009	2010–2019	2000-2019	2000-2019 (Dumitrescu and Hurlin (2012)
IncomeP & PService.*	Obs.	274	299	645	640
	Prob.	0.029	0.606	0.000	0.000
PService & IncomeP*	Obs.	274	299	645	640
	Prob.	0.298	0.106	0.014	0.000

Source: Prepared by the authors. *The dependent variable is presented first in each test.

In the Granger causality tests, presented in Table 7, the *p-value (prob.),* when less than 0.05, indicates causality or precedence between the variables. Thus, the Granger causality tests corroborated the correlations' results. In contrast, in the general period (2000-2019), both income policies caused or preceded public services, and the opposite was also confirmed, with bidirectional causality occurring between the variables. Also, regarding the same period, the Granger causality by the heterogeneous model of Dumitrescu and Hurlin (2012), which is vital for comparisons between countries, confirmed the results.

On the other hand, there are different results when observing the reduced periods. For 2000-2009, public services presented causality or precedence over public income policies, and the opposite situation was not verified, indicating unidirectional causality. For 2010-2019, there was no causality or precedence in the relationships between the variables. In this context, by the Granger causality tests, it is understood that there is no crowding-out effect between 2000 and 2019 between income policies and public services. However, the trend is perceived, especially when analyzing the results of 2010-2019.

Next, Table 8 shows the results of Spearman's correlations for the variables of Equation (1) of GMM system panel regression.

Table 8
Correlations between all study variables

Variables	PService	IncomeP	WUnempl.	AAP
PService	1	-	-	-
IncomeP	0.396**	1	-	-
WUnempl.	-0.085*	0.311**	1	-
AAP	-0.208**	-0.146**	0.219**	1

Source: Prepared by the authors.

In addition to the relationships already discussed between the variables IncomeP and PService, it is observed that all independent variables showed a correlation with the dependent variable IncomeP, favoring the test of Equation (1), which is pre-established. Therefore, the panel developed and tested in this study to analyze the association between income policies and public services in OECD countries between 2000 and 2019 was formed by IncomeP as dependent variables, and the variables PService, AAP, and WUnempl. being independent variables, of which, except for PService, the others are included as control, given the objective of this study.

Equation (1) was validated with *p-value (prob >f) = 0.000; Hansen's test = 0.404,* and the first-order *Arellano and Bond* test = 0.006 and second-order = 0.675, after generating the GMM system panel regression with 566 observations (35 countries and 20 years of analysis). Table 9 shows the coefficients and the *p-value (prob >f)* for each variable and the constant.

Table 9
GMM system panel regression results.

IncomeP	Coeff.	Standard Error	t	p>[t]	Int. Conf. 95%	
IncomeP L1.	0.826	0.079	10.43	0.000	0.665	0.987
PService	1.296	0.107	12.08	0.000	1.078	1.514
PService l1.	-1.126	0.102	-11.05	0.000	-1.333	-0.919
WUnempl.	0.090	0.031	2.91	0.006	0.027	0.153
AAP	-0.748	0.270	-0.28	0.783	-0.623	0.473
Const.	0.158	1.237	0.25	0.899	-2.356	2.674

Source: Prepared by the authors.

The data analysis shows that the percentage of GDP applied in income policies is explained in 82.6% by the investment of the previous year. It is important to note that this result was validated after presenting intermediate values compared to the products of the panels with fixed effect and Ordinary Least Squares (OLS).

Moreover, significant relationships were found for income policies and public services variables, which aligned with a positive relationship, confirming causality. However, the lagged assessment in one year indicates a significant and negative relationship, in which the investment in income goes in the opposite direction to the investment in public service in the following year, a crowding-out situation. While Busemeyer and Garritzmann (2017), Castles (2005), and Kautto (2002) identified the migration of resources from income policies to public services, the previous results may point in the opposite direction, that is, the trend of transfers of resources from services to income policies.

According to the previous data, the 1% increase in GDP applied to income may reduce 1.12% of GDP applied to public service in the lagged analysis in one year. Corroborating this, Graph 3 also indicated a higher income displacement on services from 2018. Subitem 4.3 discusses

the graphic relations between income policies and public services in a regionalized manner between 2010 and 2019.

Another significant relationship was between income policies and the unemployment rate, which aligns with the understanding that the increase in the unemployment rate explains increases in investments in income policies, especially in unemployment benefits.

4.3 Regionalized Assessments on the Relationships Between Income Policies and Public Services

Figure 4, below, covers regionalized analyses of the graphical relationships between the percentages of the mean GDPs of the regions/continents or the GDP of each country between income policies and public service from 2010 to 2019.

Figure 4
Regionalized Analyses: Africa, Oceania, Asia, and Europe.
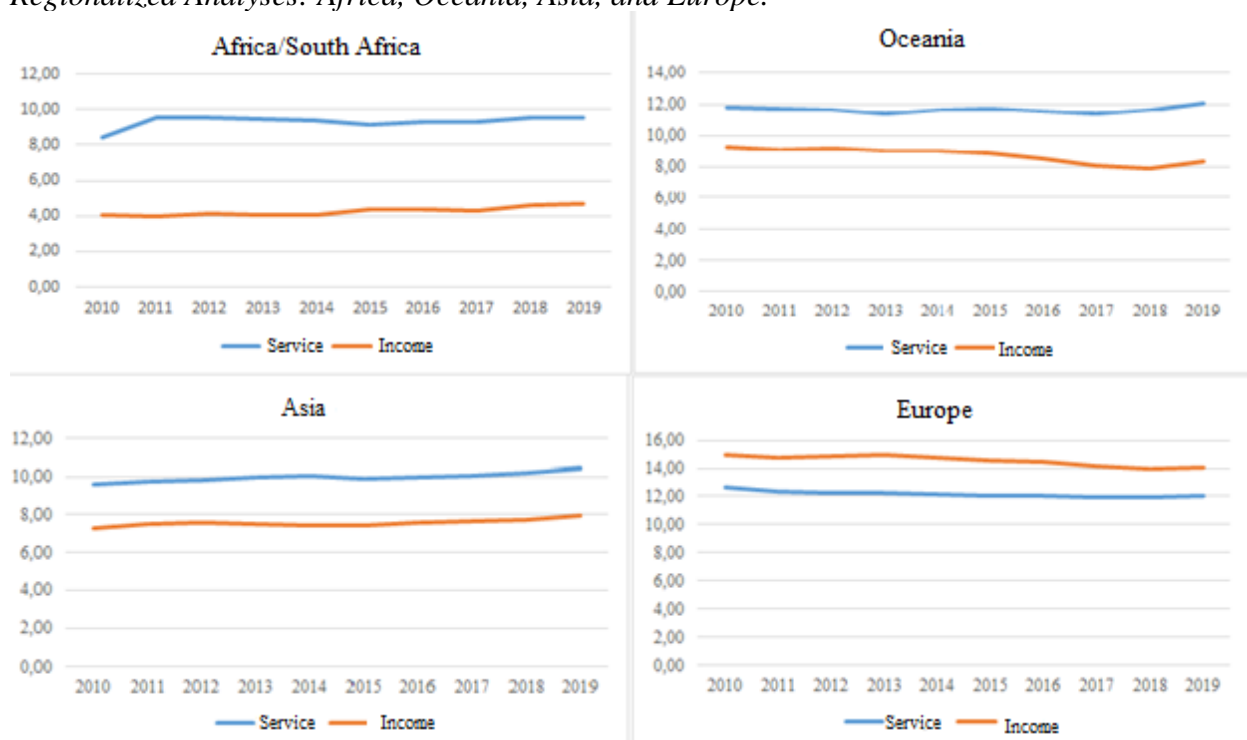
Source: OECD. Note: The constructions were limited to 2010 to 2019 due to the greater availability of data on percentages of GDPs applied in public services. Those countries in Table 2 that did not have complete data were removed from the analysis. Africa's analysis relied only on South Africa, Oceania's on Australia and New Zealand, Asia's on South Korea, Israel, Russia, and Japan, and Europe's on Germany, Austria, Belgium, Denmark, Slovenia, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Lithuania, Luxembourg, Norway, the Netherlands, Poland, Portugal, United Kingdom, Czech Republic, Slovak Republic, Sweden, and Switzerland.

Public services are stable, with investments above income policies in Africa (South Africa), Oceania, and Asia. Oceania is most prominent regarding percentages invested in public services, while South Africa has low state application in income policies. The actions of States linked to policy options and social rights probably explain the differences between these regions, as well as their economic conditions.

Europe has the highest GDPs invested, with superior income policies over public services, and in the overall OECD mean, a consequence of most OECD countries being European. The political relations of income and public services in Europe are stable, with a slight decrease in the percentage of GDP applied to both practices over the 10 years. However, this situation differs from Graph 3 for OECD countries. At this point, it is possible to understand the difference between the

results of Kautoo (2002) and Castles (2005) with the present results. These authors indicated transfers of budgets from income policies to public services, a situation opposite to that found in this study. The explanation may lie in expanding current data collected from the OECD, which differentiates the OECD context from the European context, in effect, from data from South America.

Next, Figure 5 depicts the analyses for the American continent, emphasizing Brazil, a country used as an example in the introduction of this study on contemporary changes in the relationship between income and public service.

Figure 5
Regionalized Analyses: America
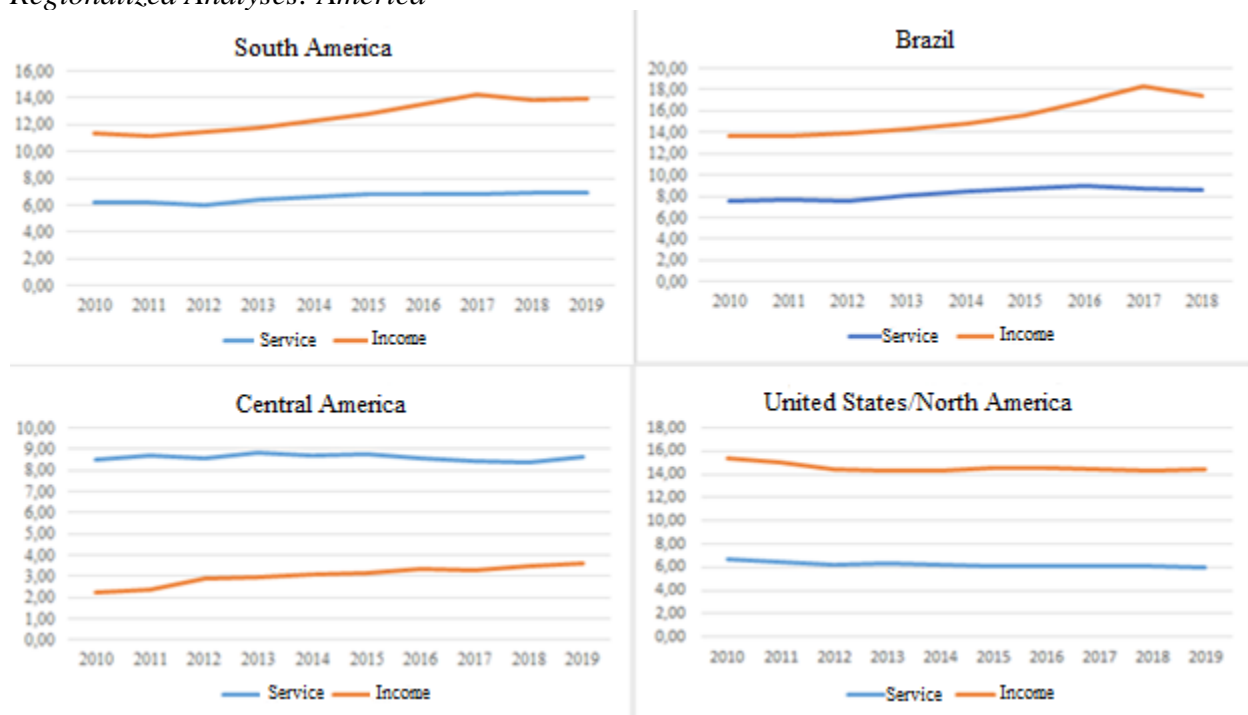
Source: OECD. Note: The constructions were limited to 2010 to 2019 due to the greater availability of data on percentages of GDPs applied in public services. Those countries in Table 2 that did not have complete data were removed from the analysis. The analysis of South America included only Brazil and Colombia, Central America with Mexico and Costa Rica, and North America with the USA.

Notably, there is a large distance between applications in income policies and public services in the US. Although there have been severe reforms in social security and pension systems, the differences are still high due to the low availability of public services in this country, which has a strong liberal tradition (Polivka & Luo, 2015). Central America, in turn, indicates the opposite direction: income policy applications have been growing in recent years. Perhaps the expansion of the Mexican conditional cash transfer program (Opportunities), discussed by Roque and Ferreira (2015), may have been important in this regard.

It is evident that the South American countries differed in the sense of budgetary valuation of income transfer programs in the last decade, as shown by Roque and Ferreira (2015), which may have an influence on the results of this study for the OECD countries of expansion of income policies, shown in Graph 3. On the other hand, social security systems were much discussed and reformed in these locations, which is indicated in Figure 2 with the decreases in income policies after 2017 (Wang et al., 2016; Botelho & Costa, 2020). The percentages of GDPs invested in public services showed small increases.

Brazil, inserted in this context, is a peculiar and rich case for analysis. The 2010s represented substantial expansions in income transfer policies (Roque & Ferreira, 2015; Pase & Melo, 2017), followed by strong advances in austerity policies, tax reforms (with emphasis on social security), and economic crises (De Bolle, 2020; Carvalho, 2020; Botelho & Costa, 2020), reducing applications in income policies. Meanwhile, investments in public services had slight valuations. It is still possible to notice an alignment between the graphs of income policies and public services in Brazil (Figure 2). However, the changes in the meaning of income policies are more substantial.

5 FINAL CONSIDERATIONS

The results indicate the expansion of income policies, which allows Hypothesis 1 to be accepted, pointing out that 'even in the face of austerity policies, public income policies showed budgetary expansion in their use in OECD countries between 1970 and 2019'. Despite the previous results, it was understood that there is a possibility of 'internal' budget disputes in income policies. At the same time, the increases are mainly linked to social security and pension policies, which may limit the budgetary valuation of the other income policies studied.

Based on Granger causality and correlation tests, it was evident that there were no crowding-out relationships between income policies and public services between 2000 and 2019. However, there may be a trend in this direction. The GMM system panel analysis confirmed the robustness of the causal relationship between income policies and public services. Nevertheless, when considering the lagged data, it pointed to a scenario of change to crowding-out, more than the trend seen by Granger causality.

Despite Hypothesis 2, a mixed discovery was conducted, indicating a period of transformation in socioeconomic and labor scenarios. It requires the attention of governments and public policymakers, making it necessary to evaluate austerity policies and reforms in tax systems to value both income policies and public services. Moreover, the results indicate that the crowding-out trend would imply the removal of resources from public services for investment in income policies.

The regionalized examination of the relationships between income policies and public services was relevant when diagnosing the stages of each region, continent, or country. In addition, it allowed for a small deepening in the discussions that may be important for future studies on income policies. Unlike the OECD context, according to the graphical analysis, it is not yet possible to see crowding-out actions in Brazil. However, there are reductions for both income policy and public service budgets, which is worrisome.

This study contributes to the debate on the relationships between public services and income policies in the 21st century, given different contexts from those seen in previous studies, and including a comprehensive database, favoring future studies in the area. As a limitation, some absences of data that reduced certain analyses stand out, such as the assessments between the 1970s and 1980s and regionalized analyses.

REFERENCES

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data:monte carlo evidence and an application to employment equations. *Review of Economic Studies*, *58*(2), 277-297. https://doi.org/10.2307/2297968

Banerjee, A. V., & Duflo, E. (2020). *Boa economia para tempos difíceis* (1a ed.). Rio de Janeiro: Zahar.

Blundell, R., & Bond, S. (1998). GMM Estimation with persistent panel data: An application to production functions. *Econometric Reviews*, *19*(3), 321-340.

Blyth, M. (2017). *Austeridade: a história de uma ideia perigosa*. Trad. José Antônio Freitas e Silva. Autonomia Literária.

Bonoli, G., & Reber, F. (2010). The political economy of childcare in OECD countries: Explaining cross-national variation in spending and coverage rates. *European Journal of Political Research*, *49*(1), 97-118. https://doi.org/10.1111/j.1475-6765.2009.01884.x

Botelho, L. H. F., Rodrigues, C., Braga, G., & Costa, T. de M. T. da. (2020). Análise do Acesso às Políticas Sociais, Desenvolvimento e Igualdade nas Capitais dos Estados Brasileiros. *XLIV ENCONTRO DA ANPAD – EnANPAD, Online*.

Bresser-Pereira, L. C. (2017). Depois do capitalismo financeiro-rentista, mudança estrutural à vista? *Novos Estudos CEBRAP*, *36*(1), 137-151. https://doi.org/10.25091/s0101-3300201700010007

Bresser-Pereira, L. C. (2018). Capitalismo financeiro-rentista. *Estudos Avançados*, *32*(92), 17-29.
Busemeyer, M. R., & Garritzmann, J. L. (2017). *The effecT of economic globalizaTion on compensaTory and social invesTmenT policies compared: a multi-level analysis of oecd countries* (Issue February).

Carvalho, L. (2020). *Curto-circuito: o vírus e a volta do Estado.* Todavia.

Castles, F. G. (2005). Social expenditure in the 1990s: Data and determinants. *Policy & Politics*, *33*(3), 411-430.

Castles, F. G. (2009). What welfare states do: A disaggregated expenditure approach. *Journal of Social Policy*, *38*(1), 45-62. https://doi.org/10.1017/S0047279408002547

De Bolle, M. B. (2020). *A pilha de areia: ruptura*. Intrínseca.

Draibe, S. M., & Riesco, M. (2011). Estados de Bem-Estar social e estratégias de desenvolvimento na América Latina. Um novo desenvolvimentismo em gestação? *Sociologias*, *27*, 220-254. https://doi.org/10.1590/S1517-45222011000200009

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, *29*(4), 1450-1460. https://doi.org/10.1016/j.econmod.2012.02.014

Esping-Andersen, G. (1990). As três economias políticas do Welfare State. In *The theree worlds of welfare capitalism*. Princeton, Princeton university press.

Esping-Andersen, G. et al. (2002). *Why we need a new welfare state.* Oxford: Oxford University Press.

Farla, K., de Crombrugghe, D., & Verspagen, B. (2016). Institutions, Foreign Direct Investment, and Domestic Investment: Crowding Out or Crowding In? *World Development*, *88*, 1-9. https://doi.org/10.1016/j.worlddev.2014.04.008

Fernandez, R. N., Shikida, C., Rauter Menezes, G., & Martins de Almeida, R. H. (2018). Análise dos Efeitos Crowding-in e Crowding-out para a Economia Brasileira. *SINERGIA - Revista Do Instituto de Ciências Econômicas, Administrativas e Contábeis*, *21*(2), 71-80. https://doi.org/10.17648/sinergia-2236-7608-v21n2-7349

Gonzalez, L. & Barreira, B. (2020). *Efeitos do auxílio emergencial sobre a renda: excessivas são a pobreza e a desigualdade, não o auxílio*. FGV-EAESP.

Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric*, *37*(3), 424-438.

Hemerijck. (2017). A Revolução silenciosa do paradigma de investimento social na União Europeia. In P.H. de A. Rodrigues, I. S. Santos (Org). *Políticas e riscos sociais no Brasil e na Europa: convergências e divergências. Editora Hucitec* (pp. 25-60).

Hossain, T., & Li, K. K. (2014). Crowding out in the labor market: A prosocial setting is necessary. *Management Science*, *60*(5), 1148-1160. https://doi.org/10.1287/mnsc.2013.1807

Kautto, M. (2002). Investing in services in West European welfare states. *Journal of European Social Policy*, *12*(1), 53-65. https://doi.org/10.1177/0952872002012001636

Kerstenetzky, C. L., & Guedes, G. P. (2018). O Welfare State resiste? Desenvolvimentos recentes do estado social nos países da OCDE Is the Welfare State resisting? Recent developments of the social state in OECD countries. *Ciência e Saúde Coletiva*, *23*(7), 2095-2106.

Khoma, N., & Vdovychyn, I. (2020). Deconstruction of the welfare state: The impact of globalization and technological factors. *Revija Za Socijalnu Politiku*, *27*(3), 269-285. https://doi.org/10.3935/rsp.v27i3.1696

Kim, Y. Y., & Choi, Y. J. (2020). Does social protection crowd out social investment? *Policy and Society*, *39*(2), 208-225. https://doi.org/10.1080/14494035.2019.1677377

Martinelli, L. A. (2020). A Basic Income Trilemma: Affordability, Adequacy, and the Advantages of Radically Simplified Welfare. *Journal of Social Policy*, *49*(3), 461-482.

Noel, A. (2019). The Politics of Minimum Income Protection in OECD Countries. *Journal of Social Policy*, *4*(2), 227-227.

OCDE. (2021). *Declaração do Secretário-Geral da OCDE, Mathias Cormann, sobre o resultado da Reunião de Ministros das Finanças do G7*.

Parijs, V. P., & Vanderborght, Y. (2018). *Renda básica: uma proposta radical para uma sociedade livre e economia sã*. Cortez.

Paterson, B. (2015). Questioning the common sense: was Scottish independence really an alternative to UK neoliberalisation. *Capital & Class, 39*(3), 493-514.

Pase, H. L., & Melo, C. C. (2017). Políticas públicas de transferência de renda na América Latina. *Revista de Administração Pública*, *51*(2), 312-329. https://doi.org/10.1590/0034-7612150770

Piketty, T. (2014). *O capital no século XXI* (1a ed.). Intrínseca.

Polivka, L., & Luo, B. (2015). The Neoliberal Political Economy and Erosion of Retirement Security. *The Gerontologist, 55*(2).

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, *9*(1), 86-136. https://doi.org/10.1177/1536867x0900900106

Roque, D. M., & Ferreira, M. A. M. (2015). O que realmente importa em programas de transferência condicionada de renda? Abordagens em diferentes países. *Saúde e Sociedade, 24*, 1193-1207.

Rossi, P., Dwech, E., & Arante, F. (2018). Economia Política da Austeridade. In *Economia para Poucos: Impactos Sociais da Austeridade e Alternativas para o Brasil.* Editora autonomia literária.

Salvador, E. da S. (2017). O desmonte do financiamento da seguridade social em contexto de ajuste fiscal. *Serviço Social & Sociedade*, *130*, 426-446. https://doi.org/10.1590/0101-6628.117

Saraceno, F., Semmler, W., & Young, B. (2020). European economic, fiscal, and social policy at the crossroads. *Constellations*, *27*(4), 573-593. https://doi.org/10.1111/1467-8675.12540

Silva, F. Q., & Cabral, B. P. (2021). *P&D e Produtividade na Indústria de Saúde Humana no Mundo*. 1210-1223. https://doi.org/10.5151/v-enei-699

Suplicy, E. M. (2004). *Renda Básica de Cidadania: a saída é pela porta* (3a ed.). Cortez Editora.

Wang, X., Williamson, J. B., & Cansoy, M. (2016). Developing countries and systemic pension reforms: Reflections on some emerging problems. *International Social Security Review, 69*.

Wispelaere, J. de, & Stirton, L. (2017). When Basic Income Meets Professor Pangloss: Ignoring Public Administration and Its Perils. *Political Quarterly*, *88*(2), 298-305.

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Roles	1st author	2nd author	3nd author	4nd author
Conceptualization	♦	♦		♦
Data curation	♦		♦	
Formal analysis	♦		♦	
Funding acquisition	♦	♦		♦
Investigation	♦		♦	
Methodology	♦		♦	
Project administration	♦	♦		♦
Resources	♦			
Software	♦		♦	

Supervision		♦		♦
Validation	♦	♦	♦	♦
Visualization	♦	♦	♦	♦
Writing – original draft	♦			
Writing – review & editing	♦			

CONFLICT OF INTEREST

The authors assert that there is no conflict of interest related to this submitted work.