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Analysis of the Effects of Law 12.734/12 on the Distribution of Oil Royalties Among Brazilian States

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ABSTRACT

This study aims to contribute to the debate on the changes to the distribution methods and quotas for oil royalties provided for in Law No. 12.734/2012, which has had its effects suspended by a precautionary measure issued by the Federal Supreme Court (STF) since 2013. We propose a specific and careful empirical exercise that allows us to analyze and quantify the values that would be associated with each state government if the effects of this law had not been suspended. Based on the debt/credit values obtained for each state for the years 2013 to 2022, we suggest an analysis of the relevance of this value in relation to revenue, the relationship between the value of royalties and socio-economic variables, and the possible effects and impacts of receiving/paying royalties on public investments.

Keywords: oil royalties; special oil fund; federalism.

JEL: C40; H23; H77.

SUMMARY

1. INTRODUCTION	4
2. RELATED LITERATURE ON BARGAINING AND FEDERALISM.....	6
3. METHODOLOGY.....	8
4. RESULTS.....	12
5. CONCLUSION.....	23
BIBLIOGRAPHICAL REFERENCES	27
APPENDIX.....	30

1. INTRODUCTION

The transfer of federal resources to subnational federative entities in Brazil is a topic of great importance and is widely discussed in academic literature, in the legal world and among decision-makers in the executive and legislative branches. The practice of these transfers plays a fundamental role in promoting social equity and regional development in the country, as well as playing a crucial role in reducing social and economic disparities between the different regions of the country, thus promoting greater social equity.

In this vein, federal transfers act as a catalyst for economic development in less developed areas. By providing additional resources for infrastructure and development programs, these transfers help to boost sectors of agriculture, industry and commerce, stimulating the local economy. It is also possible to highlight their counter-cyclical role in smoothing out negative shocks to the economy, since during periods of economic crises or social emergencies, federal transfers can play a strategic role by providing additional resources to sub-national entities. This helps stabilize the local economy, providing financial support for social assistance programs and economic revitalization.

These resource transfers are also related to strengthening the administrative and fiscal capacities of states and municipalities. By receiving these resources, sub-national entities are able to improve their administrative structures, invest in training civil servants and implement more efficient management practices.

Considering the relevance briefly described, there needs to be a taxonomy on this type of procedure involving public resources, and there are therefore constitutional or discretionary transfers, which can have a specific or free destination. It is also to be expected that there will be political disputes over the "fiscal war" between the 26 state governments, the Federal District and the 5,500 municipalities in Brazil, involving legislation on the receipt of these constitutional transfers, or the merits of discretionary transfers.

In this context, the political bargaining game for the distribution of federal resources in Brazil is a common practice in the country's politics and involves negotiations and agreements between different political actors in order to obtain a share of the available public resources. In this bargaining game, one of the most visible practices is through Parliamentary Amendments. Members of parliament and senators have the prerogative to allocate funds to specific projects in their states or municipalities. This allows them to serve the interests of their electoral bases and gain political support.

In political negotiations and coalition presidentialism to obtain resources, politicians often have to forge alliances and coalitions with other political actors. These negotiations involve support for projects of interest to the government in exchange for resources for regional projects, and the formation of party coalitions to support the central government is common. The parties that make up the coalition often receive benefits in exchange for their support, such as positions in the government and resources for projects in their electoral bases.

Under federalism and decentralization, in which the federal government, states and municipalities have financial and administrative autonomy, the Brazilian system gives significant autonomy to states and municipalities in the management of resources. This leads to competition for resources between different levels of government, with governors and mayors seeking to obtain a greater share of federal funds.

Other practices are political use where the distribution of resources is often used for political purposes, strengthening the power of certain groups or parties to the detriment of others. This can lead to inequalities in the allocation of resources and favor regions or projects aligned with dominant political interests, control and transparency where the inappropriate or corrupted use of these resources can lead to scandals and investigations that affect distribution, clientelism and electoral bases that involve politicians allocating public resources directly to supporters or participants in exchange for political loyalty, using these resources as an electoral strategy and regional inequalities, because Brazil is a vast and diverse country with great regional inequalities, the distribution of federal resources can be used to mitigate or accentuate these inequalities, depending on political priorities and ongoing negotiations.

However, it is important to note that this bargaining game can also generate positive results, such as the decentralization of resources to areas that really need investment, the promotion of regional development and the implementation of public policies that meet local demands. Therefore, although there are challenges and criticisms associated with this practice, it remains a fundamental part of the Brazilian political system.

Against this backdrop of federal bargaining associated with the legal conflict aimed at regulating the distribution of certain sources of resources from the perspective of transfers, this study looks at the distribution of part of the oil royalties among state governments over the last decade.

More precisely, a decade ago, Direct Action of Unconstitutionality (ADI) 4917, among others with the same intent, questioned the constitutionality and suspended the effects of Law 12.734/12.

This law was aimed at a new distribution of oil royalties among the states of the federation and would make the distribution more advantageous for non-producing states. At the center of the issue, as plaintiffs in the lawsuits, are the states of Rio de Janeiro, São Paulo and Espírito Santo, whose argument is based on a possible "*inversion of the constitutional system of payment of royalties and special participations, placing at its center the non-producing states and municipalities, whose revenues are immediately and progressively increased in a very intense way, at the expense of the producing entities*".

It should also be noted that the bargaining for resources is dynamic. At the time of the approval of Law 12.734/12 and the suspension of its effects by a decision of the Supreme Court, and which continues to this day, there were, on the one hand, 3 states with large reserves of resources for production off their coasts and, on the other hand, the other 23 states wanting a slice of this production.

However, the game could change: the Equatorial Margin¹ (PETROBRAS 2023) has significant exploration potential, so much so that the region is already being considered as the "new pre-salt". In addition, the northeast of Brazil has great potential for the production of clean and renewable energies, solar and wind, including offshore production, with great potential for the production of fuels such as Green Hydrogen, which could become the target of bargaining by the other states for a share of this exploration.

In addition to the legal theses listed in the discussion, the first objective of this study is to measure how much the rules brought in by Law 12.734/12 would impact the amounts to be distributed to each state during the period between 2013 and 2022.

Secondly, the study analyzes and quantifies the possible impacts of these revenues via transfers on investments, and the relationship between royalty amounts and some of the main socio-economic indicators.

This study is organized in such a way that in section 2, there is an objective presentation of the related literature on federative bargaining. Section 3 details the methodology for calculating the annual values for each state. The fourth section reports the values and suggests economic analyses. The fifth section presents the final comments.

2. RELATED LITERATURE ON BARGAINING AND FEDERALISM

¹ Located off the Brazilian coast between the states of Amapá and Rio Grande do Norte, it is the newest exploration frontier in deep and ultra-deep waters.

Federal bargaining over resources has already been the subject of intense research.

In his work, Nogueira (2009) points out, based on the work of Furtado (1965), Soares (1973), Kinzo (1993) and Souza (2003), that there is a current of literature that emphasizes regional conflicts, taking the federal units or their regions, depending on the type of issue in question, as the actors.

According to Nogueira (2009), the North, Northeast and Center-West (N-NE-CO) regions are usually identified as conservative agents. These regions have received the most benefits since the middle of the last century, mainly due to the obligation to have national parties and the vast role of the Senate which, as well as being the revising house, has a considerable number of exclusive prerogatives.

In addition, Nogueira (2009) seeks to demonstrate that the majority of federal deputies who are part of the most regionally concentrated caucuses in the Chamber of Deputies belong to the largest national parties, i.e. they originate from just a few states. Thus, to make up a simple majority in votes, only three to seven state sections of the most significant party caucuses in the Chamber of Deputies are needed.

The work by Graton, Bonacim and Sakurai (2020) is based on the Theory of Coalition Formation which, in turn, deals with government mechanisms for maintaining coalitions through political parties (FIGUEIREDO E LIMONGI, 2006; SANTOS, 2002). This research seeks to investigate the existence of a possible political bargaining relationship between the Executive and Legislative branches in the federal budget process.

The results confirm the hypothesis that there is political bargaining between the executive and legislative branches, because the parliamentarian who had the most amendments implemented was precisely the one who, in addition to supporting the executive by voting in favor of the bills sent to the national congress, did not belong to the government coalition and was targeted by the executive in order to obtain sufficient numbers to get bills approved.

There is therefore a possible discretion on the part of the executive branch to make non-compulsory expenditures (GONTIJO, 2010; LIMA E VIANA, 2016). Coupled with the Legislative Branch's interest in clientelist politics, through which it is able to implement amendments that benefit its main bases, this flaw creates the possibility of political bargaining between these powers.

Still in the field of clientelism and electoral bases, Arretche and Rodden (2004) seek to identify which states political representatives allocate the most resources to. Taking the work of (COX AND MCCUBBINS, 1986) as a reference, they show that one of the strategies would

be to invest in places where party leaders have massive support. Another strategy - based on the work of Dixit and Londregan (1996), and Lindbeck and Weibull (1987) - would be to allocate resources to regions with the largest number of undecided voters, winning over these voters.

Another view on federative bargaining is the work of Arretche (2005), who analyzes Brazil's federative coordination in its relations by examining the path of decisions in fiscal and tax matters, coming to the conclusion that federative disputes have ended up shifting from the search for exclusive taxation to the area of resource transfers. In addition, he explains that Brazil's federative model tends to combine the decentralization of resources with the centralization of tax collection and spending decisions, i.e. the Brazilian federation tends to limit the autonomy of sub-national governments in regulating tax collection and the destination of spending.

3. METHODOLOGY

The methodology is presented in two parts, a reverse methodology to arrive at the amounts due if Law 12.734/12 had not been suspended and a comparative methodology, both with multiples, ICMS collection and state investment, and between the economic and social characteristics of the states to present a sizing of the results found and the impacts they would have for each state.

Law 12.734/12 didn't just bring about changes in the distribution percentages, it also brought about some restrictions in relation to receipt. These locks say that each state must choose whether to receive the normal distribution of royalties (concession, sharing and special participation) or the Special Petroleum Fund (FEP). If it chooses to receive the normal royalties, the amounts it would be entitled to in the FEP will be distributed among the other states. If you opt for the EFF, the amounts you would be entitled to in the normal distribution will be added to the total amount allocated to the EFF and distributed to all the states that opted for the EFF.

As the aim is to deal with previous periods, the assumption is that the states would opt for the highest amount they would be entitled to in the sum of the year. Therefore, it would be necessary to know how much each state would be entitled to in each form of distribution.

To do this, we started from the amounts distributed as EFF according to the current rules, using the data on the distribution of royalties and special participations on the website of the National Petroleum Agency (ANP), using a reverse methodology (both for concession amounts of 5% and more than 5% and for sharing amounts of 5% and more than 5%), where we divided the amount allocated to the EFF by the percentage of the law that currently governs distribution.⁸

As a result of what was said in the previous paragraph, we arrived at the amount of sea royalties, reduced this amount by the amount of royalties distributed, and found the land royalties (the land royalties are not allocated to the EFF), with the sea royalties being the focus of this work because they are the ones that have undergone changes in their percentages and distribution rules.

This same methodology was used for royalties from concessions, sharing and special participations. The following table shows the distribution amounts and percentages (as an example, table 3.1 shows the amounts distributed in 2022 and the total percentages and table 3.2 refers only to the amounts of sea royalties and the percentages).

Table 3.1. Comparison of the Percentages Applied in Practice and Those Established in the Current Legislation

ROYALTIES TOTAL						
BENEFICIÁRIOS CONCESSÃO	Lei nº 7.990/89	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 7.990/89	Lei nº 9.478/97	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 9.478/97
Estados	7.052.317.206,76	31,90%	30,00%	5.136.641.734,97	23,90%	22,50%
Municípios	8.660.885.877,64	39,20%	40,00%	6.388.662.552,91	29,80%	30,00%
Fundo Especial	2.189.117.635,79	9,90%	10,00%	1.561.075.388,28	7,30%	7,50%
União - Comando da Marinha	990.526.323,59	19,00%	20,00%	715.134.982,94	39,00%	40,00%
União - Ministério da Ciência, Tecnologia e Inovações	-			1.246.760.006,22		
União - Fundo Social	2.098.802.108,70			4.192.265.694,39		
União - Educação e Saúde	1.112.928.516,58			2.225.855.901,22		
TOTAL	22.104.577.669,06	100,00%	100,00%	21.466.416.260,93	100,00%	100,00%
BENEFICIÁRIOS PARTILHA	Lei nº 7.990/89	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 7.990/89	Lei nº 9.478/97	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 9.478/97
Estados	1.559.120.095,83	30,00%	30,00%	2.338.680.130,31	22,60%	22,50%
Municípios	2.074.374.139,99	39,90%	40,00%	3.068.320.749,30	29,80%	30,00%
Fundo Especial	519.706.812,10	10,00%	10,00%	779.560.043,43	7,50%	7,50%
União - Comando da Marinha	1.039.414.759,21	20,00%	20,00%	4.157.653.565,11	40,10%	40,00%
União - Ministério da Ciência, Tecnologia e Inovações						
União - Fundo Social						
União - Educação e Saúde						
TOTAL	5.192.615.807,13	100,00%	100,00%	10.364.214.488,15	100,00%	100,00%

Note: 2022 Values. Source: Own Elaboration with Data Provided by ANP

Table 3.2. Comparison of the Percentages Excluding Land Royalties

ROYALTIES - PRODUÇÃO PLATAFORMA CONTINENTAL, NO MAR TERRITORIAL OU NA ZONA ECONÔMICA EXCLUSIVA							
BENEFICIÁRIOS CONCESSÃO	Lei nº 7.990/89	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 7.990/89	Lei nº 9.478/97	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 9.478/97	% LEI 12.734/12
<i>Estados</i>	6.567.352.907,37	30,00%	30,00%	4.683.229.164,84	22,50%	22,50%	20%
<i>Municípios</i>	8.756.470.543,16	40,00%	40,00%	6.244.301.553,12	30,00%	30,00%	6%
<i>Fundo Especial</i>	2.189.117.635,79	10,00%	10,00%	1.561.075.388,28	7,50%	7,50%	54%
<i>União - Comando da Marinha</i>	4.378.235.271,58	20,00%	20,00%	8.325.735.404,16	40,00%	40,00%	20%
<i>União - Ministérios</i>							
<i>União - Fundo Social</i>							
<i>União - Educação e Saúde</i>							
TOTAL	21.891.176.357,90	100,00%	100,00%	20.814.338.510,40	100,00%	100,00%	100,00%
BENEFICIÁRIOS PARTILHA	Lei nº 7.990/89	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 7.990/89	Lei nº 9.478/97	% DISTRIBUIÇÃO NA PRÁTICA	% Lei nº 9.478/97	% LEI 12.734/12
<i>Estados</i>	1.555.780.604,99	30,00%	30,00%	2.338.680.130,31	22,60%	22,50%	22%
<i>Municípios</i>	2.074.374.139,99	40,00%	40,00%	3.088.320.749,30	29,80%	30,00%	7%
<i>Fundo Especial</i>	518.593.535,00	10,00%	10,00%	779.560.043,43	7,50%	7,50%	49%
<i>União - Comando da Marinha</i>	1.037.187.070,00	20,00%	20,00%	4.157.853.565,11	40,10%	40,00%	22%
<i>União - Ministérios</i>							
<i>União - Fundo Social</i>							
<i>União - Educação e Saúde</i>							
TOTAL	5.185.935.349,98	100,00%	100,00%	10.364.214.488,15	100,00%	100,00%	100,00%

Note: 2022 Values. Source: Own Elaboration

Once this amount is available, the new vector of distribution percentages given by law 12.734/12 (table 3.3) is applied, thus finding the amount earmarked for the distribution of normal royalties to the states and the amount earmarked for distribution via the FEP. It should be noted that the transition percentages (table 3.4) were taken into account when applying the new percentages, and this calculation was done separately for each form of royalty generation (concession, sharing and special participation), as they have some different distribution percentages (table 3.3), and then added together.

With these new amounts to be distributed, to calculate the amount for each state, the distribution is made in proportion to the amounts received, dividing the amount received by each state in each modality by the sum of that modality in the year and multiplying by the new amount to be distributed.

Finally, the option lock is applied, where the amounts that each state would receive are compared and it is considered that it would opt for the highest amount. Then the EFF amounts of those that would opt to receive the normal amount are redistributed among the other states and the normal amounts of those that would opt to receive the EFF amounts are added to the amount to be distributed via the EFF.

With these final amounts in hand, the amounts that each state actually received are subtracted and, thus, the amount that each state failed to receive or received more considering the rules given by law 12.734/12 is obtained.

In the comparison methodology, we used the ratio between the amounts found that would be allocated to each state and the multiples cited to obtain the comparative percentages, as well as a comparison, through scatter plots, of the amounts found for each state per inhabitant and the variables per capita income, MHDI, Gini Index and percentage poor population.

Table 3.3. Comparison of Current Percentages with Those of the Contested Legislation

Compensação Financeira	Legislação Vigente		Legislação Contestada
	Até 5%	Mais de 5%	Até 5% ou mais
	na plataforma continental, no mar territorial ou na zona econômica exclusiva	na plataforma continental, no mar territorial ou na zona econômica exclusiva	na plataforma continental, no mar territorial ou na zona econômica exclusiva
Estados Impactados			
Royalties da concessão e na cessão onerosa	30,0%	22,5%	20,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	22,0%
Participação especial	40,0%	40,0%	20,0%
Municípios Impactados			
Royalties da concessão e na cessão onerosa	30,0%	22,5%	4,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	5,0%
Participação especial	10,0%	10,0%	4,0%
Municípios com intalação de bem. e des.			
Royalties da concessão e na cessão onerosa	10,0%	7,5%	2,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	2,0%
Fundo Especial Estados			
Royalties da concessão e na cessão onerosa	10,0%	7,5%	27,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	24,5%
Participação especial	0,0%	0,0%	15,0%
Fundo Especial Municípios			
Royalties da concessão e na cessão onerosa	0,0%	0,0%	27,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	24,5%
Participação especial	0,0%	0,0%	15,0%
União			
Royalties da concessão e na cessão onerosa	20,0%	40,0%	20,0%
Royalties na partilha	não existia - aplica a regra da concessão	não existia - aplica a regra da concessão	22,0%
Participação especial	50,0%	50,0%	46,0%

Source: Own Elaboration with Data from the Legislation

Table 3.4. Transition Rules of Law 12.734/12

REGRAS DE TRANSIÇÃO ATÉ 5% E MAIS DE 5% ROYALTIES NA CONCEÇÃO								
BENEFICIÁRIOS	2013	2014	2015	2016	2017	2018	2019	2020
<i>Estados</i>	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%
<i>Municípios</i>	15,0%	13,0%	11,0%	9,0%	7,0%	5,0%	4,0%	4,0%
<i>Municípios afetados</i>	3,0%	3,0%	3,0%	3,0%	2,0%	2,0%	2,0%	2,0%
<i>Fundo Especial Estados</i>	21,0%	22,0%	23,0%	24,0%	25,5%	26,5%	27,0%	27,0%
<i>Fundo Especial Municípios</i>	21,0%	22,0%	23,0%	24,0%	25,5%	26,5%	27,0%	27,0%
<i>União</i>	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%	20,0%
TOTAL	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

REGRAS DE TRANSIÇÃO PARTICIPAÇÃO ESPECIAL								
BENEFICIÁRIOS	2013	2014	2015	2016	2017	2018	2019	2020
<i>Estados</i>	32,0%	29,0%	26,0%	24,0%	22,0%	20,0%	20,0%	20,0%
<i>Municípios</i>	5,0%	5,0%	5,0%	5,0%	5,0%	5,0%	4,0%	4,0%
<i>Fundo Especial Estados</i>	10,0%	11,0%	12,0%	12,5%	13,5%	14,5%	15,0%	15,0%
<i>Fundo Especial Municípios</i>	10,0%	11,0%	12,0%	12,5%	13,5%	14,5%	15,0%	15,0%
<i>União</i>	43,0%	44,0%	45,0%	46,0%	46,0%	46,0%	46,0%	46,0%
TOTAL	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Source: Own Elaboration with Data from the Legislation

4. RESULTS

In 2023, Direct Action for Unconstitutionality (ADI) 4917 turned 10 years old. This ADI challenged the constitutionality and suspended the effects of Law 12.734/12 (amending Laws 7.990/89 and 9.478/97), the purpose of which was to propose a new distribution of oil royalties among the states, making the distribution more advantageous for non-producing states.

Despite being a recent and very specific topic, two studies have already dealt with this issue. Firstly, a study by researchers from the Institute for Applied Economic Research (IPEA). In short, Gobetti et al. (2020) suggest the following:

This text seeks to contribute to the debate on the socio-economic (and constitutional) relevance of the changes in the way oil royalties are distributed, as provided for in Law 12.734/2012, the effects of which have been suspended by a precautionary measure issued by the Federal Supreme Court (STF). The research shows that the criterion for comparing states and municipalities used to determine the transfer of revenue from offshore oil production is unusual in international experience and lacks socio-economic logic, being the product of political bargaining. It also discusses evidence that the hyper-concentration of revenues is not only unfair, but also inefficient in socio-economic and fiscal terms. The study offers elements in favor of expanding the share of resources divided among all Federation entities through the Special Petroleum Fund, as provided for in Law No. 12.734/2012.

However, as already explained, this study focused on quantifying the amounts. In other words, the aim is to estimate the impact of law 12.734/12, using data on royalties and special participation published by the National Petroleum Agency (ANP). The result of this IPEA study is shown in Table 4.1 below, prepared by the authors, which presents data from 2009 to 2019 and projections for 2020 to 2023 with the amounts that each state would receive if the rules contained in Law 12.734/12 were applied.

The other study, Gobetti (2023), which has as its author one of the co-authors of the study presented above, as well as being based on it, shows that if the transition proposed by Law 12.734/12 had started in 2013 and ended in 2019, the confronting states would not have suffered a loss of revenue in general, since the increase in production and, eventually, in the price of oil - would have compensated for the lower percentage of resources reserved for them. For example, the confronting states received R\$11 billion in 2013 and would have received R\$15 billion in

2021 and R\$23.5 billion in 2022 if Law 12.734/12 had been in force.

On the other hand, in 10 years, it is estimated that the non-producing states stopped receiving R\$89 billion from the EFF due to the injunction that suspended the effects of Law 12.734/12. In other words, the Special Oil Fund received R\$4 billion in royalties during this decade, when according to Law 12.734/12 it should have received R\$93 billion.

Table 4.1. Projection of State Revenues (R\$ million) with the Application of Law No. 12.734, Based on IPEA Study

Estados	Média 2009 - 2018	2019	Com regra de transição				Sem regra de transição			
			2020	2021	2022	2023	2020	2021	2022	2023
Total	10.169	20.486	26.441	25.698	25.802	25.439	25.923	25.711	26.249	26.076
Rio de Janeiro	7.265	14.305	12.790	12.116	11.661	11.217	9.779	9.975	10.282	10.347
Espirito Santo	1.253	2.775	1.860	1.559	1.489	1.341	1.378	1.219	1.264	1.213
São Paulo	623	2.204	1.540	1.197	946	703	1.148	960	818	643
Outras UFs	1.029	1.203	10.251	10.826	11.707	12.178	3.617	13.557	13.884	13.872
Acre	8	15	346	368	401	418	468	466	479	479
Alagoas	38	40	442	467	505	523	590	586	600	597
Amazonas	227	283	474	492	503	515	576	574	569	566
Amapá	8	14	341	362	394	412	460	459	471	471
Bahia	216	234	1.112	1.161	1.241	1.275	1.438	1.424	1.451	1.438
Ceará	31	44	729	774	843	879	983	979	1.006	1.007
Distrito Federal	-	-	69	73	79	83	93	92	95	95
Goias	7	12	283	300	327	341	382	380	391	391
Maranhão	40	63	754	798	867	904	1.022	1.019	1.046	1.047
Minas Gerais	11	19	448	476	518	541	605	603	620	620
Mato Grosso do Sul	3	6	136	144	157	164	183	182	188	188
Mato Grosso	5	10	228	243	264	276	308	307	316	316
Pará	14	26	613	651	710	741	828	825	848	848
Paraíba	11	20	473	502	547	571	638	636	654	654
Pernambuco	16	29	685	728	793	828	925	922	948	948
Piauí	10	18	432	459	500	522	584	582	598	598
Paraná	11	18	290	308	335	349	389	388	399	399
Rio Grande do Norte	212	202	591	614	643	664	737	732	737	737
Rondônia	7	12	285	302	329	344	384	383	394	394
Roraima	6	11	251	267	291	304	339	338	348	348
Rio Grande do Sul	6	10	227	241	262	274	306	305	314	314
Santa Catarina	3	5	126	134	146	152	170	170	174	174
Sergipe	129	95	489	512	558	581	633	629	651	653
Tocantins	10	18	427	453	494	516	576	574	590	590

Table 4.2, drawn up by FGV (2023), shows how the distribution was and estimates the amounts that would have been distributed if Law 12.734/12 had not been suspended.

It is important to note that the first study provides projected figures for 2020 to 2023, while the second provides general figures for all states.

In this debate, the purpose of this study is to contribute to this quantification, in order to present the amounts due to each state according to the rules contained in Law 12.734/12 if its effects were not suspended from 2013 to 2022. It is important to note that this study deals with offshore royalties, i.e. those whose production takes place on the continental shelf, in the territorial sea or in the economically exclusive zone, since it was these that suffered changes to their distribution percentages under Law 12.734/12, which had its effects suspended by a decision, still provisional, of the Supreme Court.

Table 4.2. Current Scenario vs. Alternative Scenario (R\$ million) if Law 12.734/2012 Were in Force, Based on FGV Study

Situação atual (A)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Royalties	16.309	18.531	13.856	11.837	15.302	23.377	23.455	22.819	37.818	59.652
Part Especial	15.497	16.828	10.680	5.911	15.168	29.608	32.556	23.888	39.664	57.633
Total	31.806	35.359	24.536	17.748	30.470	52.985	56.011	46.707	77.482	117.285
Cenário atual										
União	12.349	13.667	9.282	6.312	10.022	21.596	23.158	18.435	31.075	42.804
Estados conf.	11.032	12.187	8.317	5.786	10.450	18.463	19.550	15.987	26.383	39.400
Municípios conf/afetados	7.131	8.024	5.817	4.688	6.733	10.982	11.342	10.399	16.850	29.920
Fundo Especial	1.294	1.481	1.120	962	1.266	1.944	1.960	1.887	3.174	5.162
Estado (FPE)	259	296	224	192	253	389	392	377	635	1.032
Municípios (FPM)	1.035	1.185	896	769	1.012	1.555	1.568	1.509	2.539	4.130
Cenário nova lei										
União	11.330	11.493	7.929	5.364	10.287	18.622	19.948	15.927	26.195	38.864
Estados conf.	9.657	8.647	5.604	3.830	6.437	10.649	11.347	9.401	15.558	23.524
Municípios conf/afetados	5.388	3.759	2.447	1.708	2.146	3.145	2.741	2.366	3.898	5.931
Fundo Especial	5.431	11.459	8.556	6.846	11.600	20.568	22.075	19.013	31.831	48.966
Estado (FPE)	2.522	5.730	4.278	3.423	5.800	10.284	11.037	9.507	15.915	24.483
Municípios (FPM)	2.910	5.730	4.278	3.423	5.800	10.284	11.037	9.507	15.915	24.483

As the distribution rules set out in Law 12.734/12 would direct more resources to the special oil fund - FEP and the resources of this fund are based on the criteria of the state participation fund - FPE, it will be noticeable in the results that the northeastern states would have a greater allocation of resources than the states of the other regions.

The figures in this study refer only to the states, and do not include the figures for the union and municipalities, which also saw changes in their distribution percentages. This will become clearer when we present the amounts that states received less and those that received more, although the sums of these amounts are not equal. This difference lies in what the union and municipalities received, and a suggestion for a future study is to analyze and quantify the amounts for the union and municipalities.

Having defined the assumptions adopted, which were duly explained and justified in the

previous section, this section presents the results obtained, i.e. the annual credit or debit amounts per state over the relevant period, from 2013 to 2022.

Table A.1. in the appendix reports these values in current R\$, i.e. without inflation, so that they can be checked and compared with other values reported in similar studies, such as the FGV projection, and can be used in future studies. It should always be remembered that the Federal District is not part of the distribution of royalties from the special oil fund, and therefore this federal entity will not be part of the analysis and discussion in this article.

The table in the appendix shows that two states, Amazonas and Rio Grande do Norte, were entitled to debits in the first few years of the sample, and have been entitled to credits ever since. Three states belonging to the Southeast region, Espírito Santo, Rio de Janeiro and São Paulo, are considered to have had a duty to return annual amounts over the entire period analyzed. The other 21 states are creditors in every year of the decade in question.

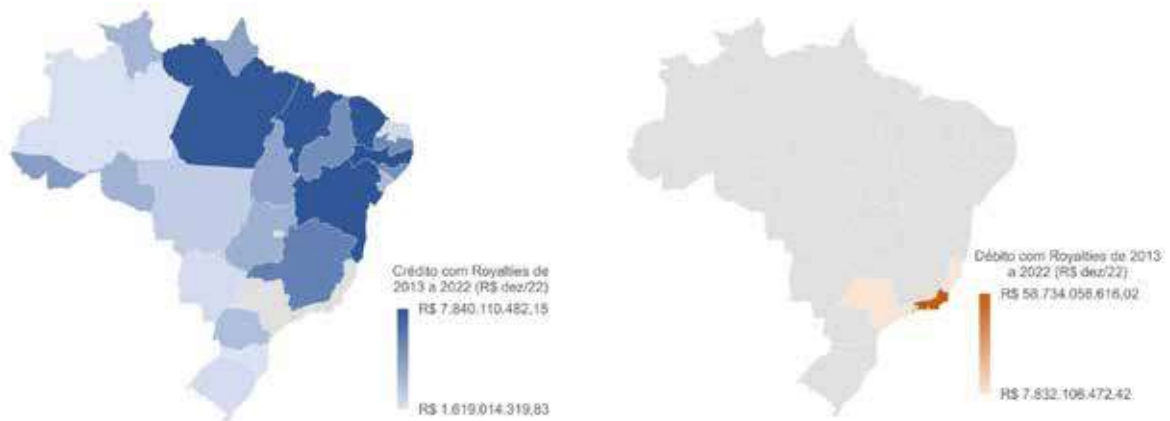
It is noteworthy that the order of magnitude varies greatly between states, and even over time for the same sub-national federative entity. Considering the inflationary effects in this period, and that different states have different sizes (measured by some revenue metric, or by GDP), the following analyses manipulate the original results reported at current prices in the appendix, in order to address these two issues.

Firstly, on the question of the value over time, it should be noted that the accumulated inflation over the period, i.e. the price variation measured by the IPCA between 2013 and 2022 was 69.68%, with high annual inflation, such as 10.67% in 2015 and 10.06% in 2021, for example.

In this context, the annual values from 2013 to 2021 are "brought to present value" from the respective accumulated IPCA, so that the monetary values analyzed are in constant December 2022 prices. The 2022 values do not need to be corrected.

Figure 4.1 summarizes on a map the real values (R\$ of Dec/2022) added up for the decade under analysis, which allows an analysis of the overall picture, paying attention to the geographical location of the "creditor" or "debtor" states.

Figure 4.1. Value of Royalties, Credit (Left) and Debit (Right), in Dec/2022 R\$.



Note: Values from 2013 to 2022. Source: Own Elaboration.

The map clearly shows the concentration of states with access to the coast in the Southeast as those that benefited from the temporary suspension, and it is possible to identify the leading role of Rio de Janeiro, which is intuitive if you consider the location of some of the main oil platforms in the country.

The map also suggests that the real or deflated amounts accumulated from 2013 to 2022 range from R\$1.62 billion for the state of Santa Catarina to R\$7.84 billion for the state of Pernambuco. The map also shows a concentration in the northeast of the country of the states with the highest absolute real amounts to be received (reasons also given in the previous section), in addition to Pernambuco, Bahia, Maranhão and Ceará stand out, as well as Pará in the north. All of these federal entities have credit in excess of R\$7 billion, in constant December 2022 prices.

In order to share the real or updated values accumulated from 2013 to 2022 for all the states, as well as the average or annual values, Table 4.3 is shown below. According to this table, Rio de Janeiro's prominence is more evident, with a debt of R\$58.73 billion, much higher than São Paulo's R\$8.31 billion and Espírito Santo's R\$7.83 billion.

This table also provides extremely relevant information because, when you add up the credit values of the 23 states, you get a total of R\$103.14 billion, while the sum of the debts is R\$74.87 billion. What could justify a difference of R\$28.27 billion over a decade?

As already mentioned, the answer lies in the fact that the federal pact associated with the sharing of royalties via the special fund included not only the 26 states, but also the 5,500 municipalities and the federal government itself.

Therefore, if the vector of credit and debit values of all these federal entities were being reported here, the difference would be zero. Therefore, the positive difference of R\$28.27

billion allows us to conclude that, in a current scenario now in 2023, in which this past from 2013 to 2022 would be legally compensated, that is, the monocratic act suspending the transfers would be rejected, and all the amounts from this period would be compensated by annual inflation, in order to credit the 23 states, it would be necessary to pay not only the debts of Rio de Janeiro, São Paulo and Espírito Santo, but also the debts of the municipal governments that were favored by the suspension and, above all, the debts of the federal government, whose share represents the majority of this difference of more than R\$28 billion.

Table 4.3. Value of Royalties (Dec/2022 R\$)

UF/ANO	Royalties (crédito/débito) em R\$ dez/2022	
	Total (2013 - 2022)	Média (2013 - 2022)
AC	R\$ 4.637.153.161,69	R\$ 463.715.316,17
AL	R\$ 5.302.882.148,16	R\$ 530.288.214,82
AM	R\$ 1.717.757.552,72	R\$ 171.775.755,27
AP	R\$ 4.470.179.523,68	R\$ 447.017.952,37
BA	R\$ 7.773.738.620,53	R\$ 777.373.862,05
CE	R\$ 7.720.731.889,15	R\$ 772.073.188,92
ES	-R\$ 7.832.106.472,42	-R\$ 783.210.647,24
GO	R\$ 3.787.185.465,17	R\$ 378.718.546,52
MA	R\$ 7.721.392.355,68	R\$ 772.139.235,57
MG	R\$ 5.887.594.204,01	R\$ 588.759.420,40
MS	R\$ 1.873.276.946,95	R\$ 187.327.694,69
MT	R\$ 2.561.002.925,52	R\$ 256.100.292,55
PA	R\$ 7.672.886.610,47	R\$ 767.288.661,05
PB	R\$ 5.419.124.902,85	R\$ 541.912.490,29
PE	R\$ 7.840.110.482,15	R\$ 784.011.048,21
PI	R\$ 5.289.299.398,23	R\$ 528.929.939,82
PR	R\$ 3.102.886.134,38	R\$ 310.288.613,44
RJ	-R\$ 58.734.058.616,02	-R\$ 5.873.405.861,60
RN	R\$ 1.975.100.428,20	R\$ 197.510.042,82
RO	R\$ 3.671.640.388,97	R\$ 367.164.038,90
RR	R\$ 3.546.535.497,16	R\$ 354.653.549,72
RS	R\$ 1.878.265.197,72	R\$ 187.826.519,77
SC	R\$ 1.619.014.319,83	R\$ 161.901.431,98
SE	R\$ 3.307.656.065,69	R\$ 330.765.606,57
SP	-R\$ 8.307.061.702,01	-R\$ 830.706.170,20
TO	R\$ 4.365.724.738,02	R\$ 436.572.473,80
Total de crédito:	R\$ 103.141.138.956,93	
Total de débito:	-R\$ 74.873.226.790,44	
Diferença:	R\$ 28.267.912.166,49	

Note: Values from 2013 to 2022. Source: Own Elaboration.

Table 4.3. also shows that the credit values vary greatly between the creditor states, with the ratio between Pernambuco's credit and Santa Catarina's being close to 5 times. Similarly, the

ratio between Rio de Janeiro's debt and Espírito Santo's is over 7 times.

With a view to a more informative *cross-state* analysis, i.e. considering the "size" of each of these states, Table 4.4. shows the real values (R\$ as of December 2022) accumulated over the decade, both in terms of revenue from the main state tax, the Tax on the Circulation of Goods and Services (ICMS), and in terms of investments paid out over the decade in question.

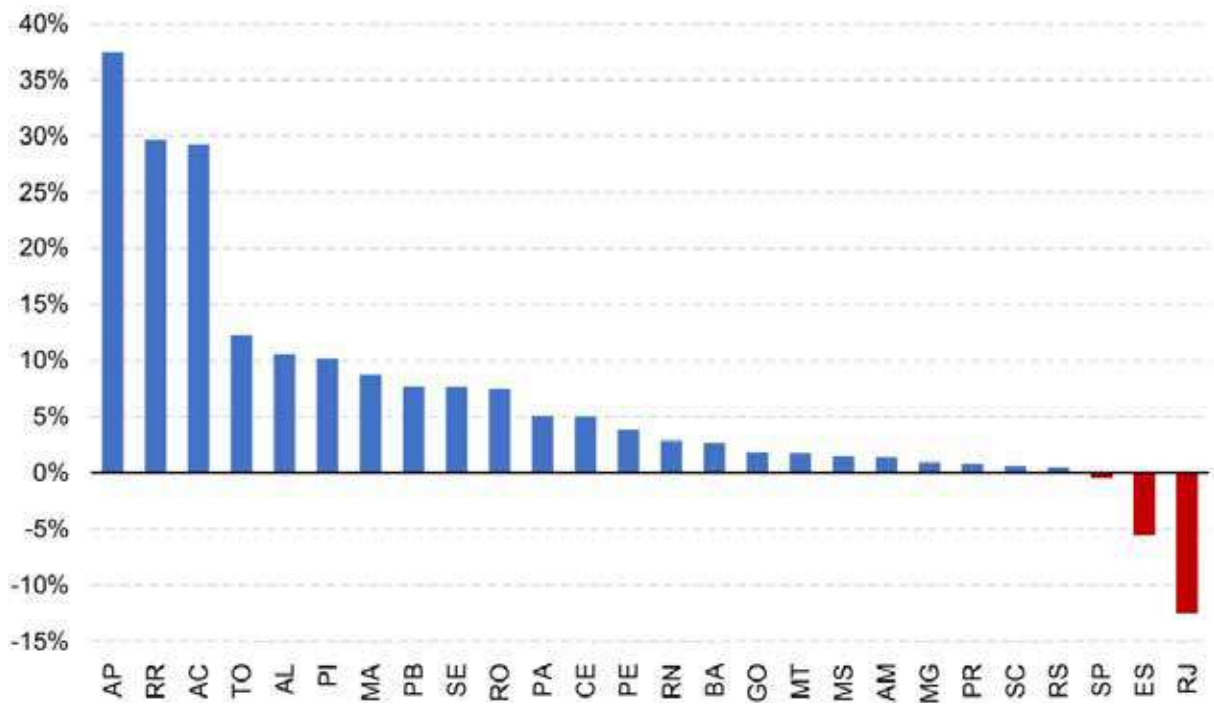
Table 4.4. Value of Royalties, Revenue from ICMS, and Paid Investments, All in Dec/2022 R\$

UF/ANO	Royalties (crédito/débito)		Receita com ICMS		Investimentos			
		Total (2013 - 2022)	Total (2013 - 2022)	Royalties/ICMS	Total (2013 - 2022)	Royalties/Investim.		
AC	R\$	4.637.153.161,69	R\$	15.835.704.188,73	29,3%	R\$	6.216.113.132,85	74,6%
AL	R\$	5.302.882.148,16	R\$	50.315.163.234,71	10,5%	R\$	11.470.619.034,80	46,2%
AM	R\$	1.717.757.552,72	R\$	120.630.941.483,86	1,4%	R\$	14.775.847.030,08	11,6%
AP	R\$	4.470.179.523,68	R\$	11.917.798.212,72	37,5%	R\$	2.331.929.087,73	191,7%
BA	R\$	7.773.738.620,53	R\$	292.859.635.293,78	2,7%	R\$	38.594.601.477,95	20,1%
CE	R\$	7.720.731.889,15	R\$	154.097.408.070,03	5,0%	R\$	30.617.716.323,70	25,2%
ES	-R\$	7.832.106.472,42	R\$	140.750.040.963,77	-5,6%	R\$	14.099.523.289,57	-55,5%
GO	R\$	3.787.185.465,17	R\$	211.550.436.296,51	1,8%	R\$	14.480.489.238,53	26,2%
MA	R\$	7.721.392.355,68	R\$	88.695.538.687,28	8,7%	R\$	14.381.348.033,48	53,7%
MG	R\$	5.887.594.204,01	R\$	623.980.333.350,83	0,9%	R\$	30.285.988.735,95	19,4%
MS	R\$	1.873.276.946,95	R\$	124.013.370.490,04	1,5%	R\$	15.663.979.557,98	12,0%
MT	R\$	2.561.002.925,52	R\$	147.446.830.420,32	1,7%	R\$	16.304.849.174,63	15,7%
PA	R\$	7.672.886.610,47	R\$	152.010.403.600,67	5,0%	R\$	24.156.873.397,43	31,8%
PB	R\$	5.419.124.902,85	R\$	70.296.772.681,41	7,7%	R\$	9.052.882.745,40	59,9%
PE	R\$	7.840.110.482,15	R\$	203.832.693.009,45	3,8%	R\$	18.930.633.578,43	41,4%
PI	R\$	5.289.299.398,23	R\$	51.879.883.218,20	10,2%	R\$	11.276.465.728,48	46,9%
PR	R\$	3.102.886.134,38	R\$	379.009.697.822,81	0,8%	R\$	18.774.948.395,39	16,5%
RJ	-R\$	58.734.058.616,02	R\$	470.097.491.508,34	-12,5%	R\$	42.488.076.965,43	-138,2%
RN	R\$	1.975.100.428,20	R\$	69.309.242.448,89	2,8%	R\$	4.949.040.136,94	39,9%
RO	R\$	3.671.640.388,97	R\$	49.211.191.075,08	7,5%	R\$	4.712.087.895,53	77,9%
RR	R\$	3.546.535.497,16	R\$	11.957.860.402,65	29,7%	R\$	2.382.429.217,49	148,9%
RS	R\$	1.878.265.197,72	R\$	425.845.271.898,26	0,4%	R\$	10.031.090.627,73	18,7%
SC	R\$	1.619.014.319,83	R\$	289.071.903.472,28	0,6%	R\$	22.457.870.545,54	7,2%
SE	R\$	3.307.656.065,69	R\$	43.130.944.613,69	7,7%	R\$	4.789.557.268,65	69,1%
SP	-R\$	8.307.061.702,01	R\$	1.867.732.218.200,18	-0,4%	R\$	102.459.739.478,91	-8,1%
TO	R\$	4.365.724.738,02	R\$	35.447.653.849,02	12,3%	R\$	6.435.161.300,85	67,8%

Note: Values from 2013 to 2022. Source: Own Elaboration, SICONFI, and CONSEFAZ

In order to order the ratio between the credit/debit accumulated over the decade and the actual amount collected with ICMS over the same period in descending order, Figure 4.2 is shown below.

Figure 4.2. Ratio Between Royalties and Revenue from ICMS, Both in Dec/2022 R\$



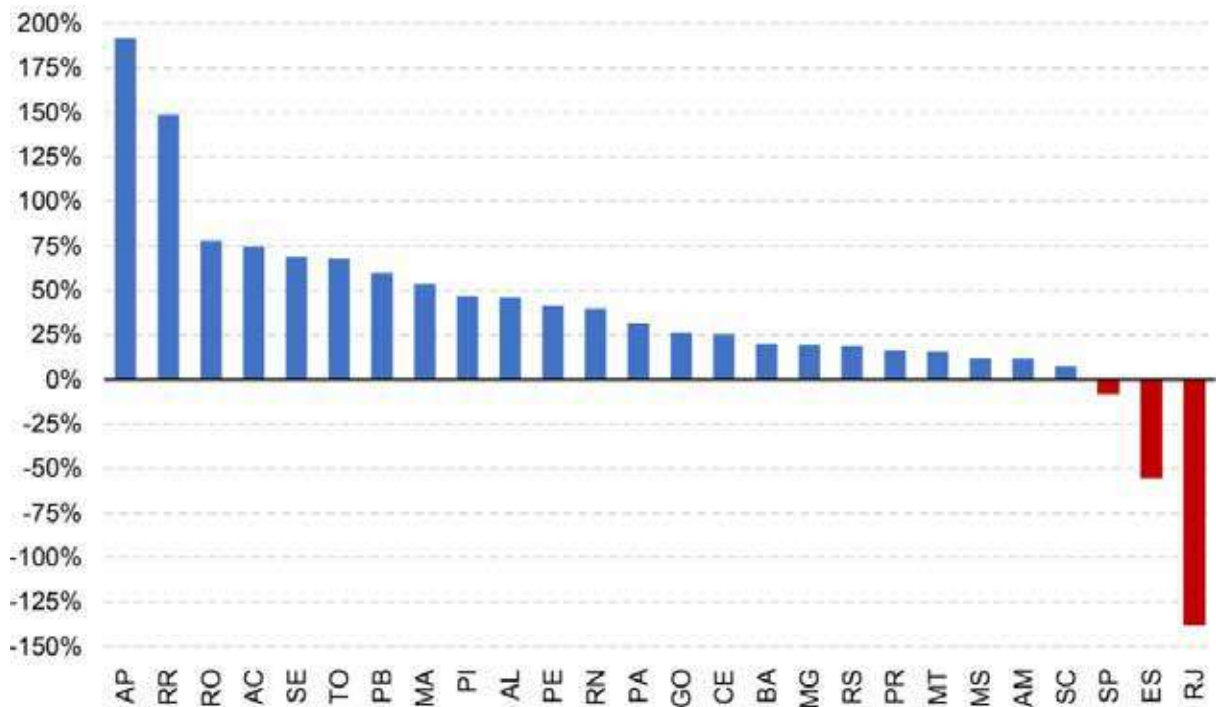
Note: Values from 2013 to 2022. Source: Own Elaboration and CONSEFAZ

From the point of view of the states with debts, it should be noted that it is entirely feasible that São Paulo will be able to repair the accumulated effects of around R\$8.32 billion, since this represents 0.4% of ICMS revenue over the last decade alone. Espírito Santo has a debt of around 5.6% of its main tax revenue, which may suggest the need for some kind of installment payment, and the same is true of Rio de Janeiro, whose debt represents 12.5% of this source of revenue. In all three cases, an installment plan for the debt accumulated over a decade does seem feasible.

With regard to credit, the 15 federal entities with the highest value of royalties as a fraction of ICMS are all from the North and Northeast regions. Only the state of Amazonas stands out slightly, coming after the states of the Midwest. It is important to note the order and size of this credit in the states of Amapá (37.5%), Roraima (29.7%) and Acre (29.3%).

This same comparative analysis can be made in relation to investment by looking at Figure 4.3.

Figure 4.3. Ratio Between Royalties and Paid Investments, Both in Dec/2022 R\$



Note: Values from 2013 to 2022. Source: Own Elaboration and SICONFI

Again, starting with the states with debts, if on the one hand a suggestion of a decade seems feasible on the grounds of representativeness in relation to the main tax, on the other hand, the impact of this payment seems considerable, if we consider that the debtor state will reduce all or most of this new expenditure from capital spending, with an emphasis on public investment. While São Paulo's debt of R\$8.31 billion represents 8.1% of the almost R\$102.46 billion invested, in Espírito Santo the accumulated debt represents 55.5% of the accumulated investment, and in Rio de Janeiro this percentage is even higher, at 138.2%.

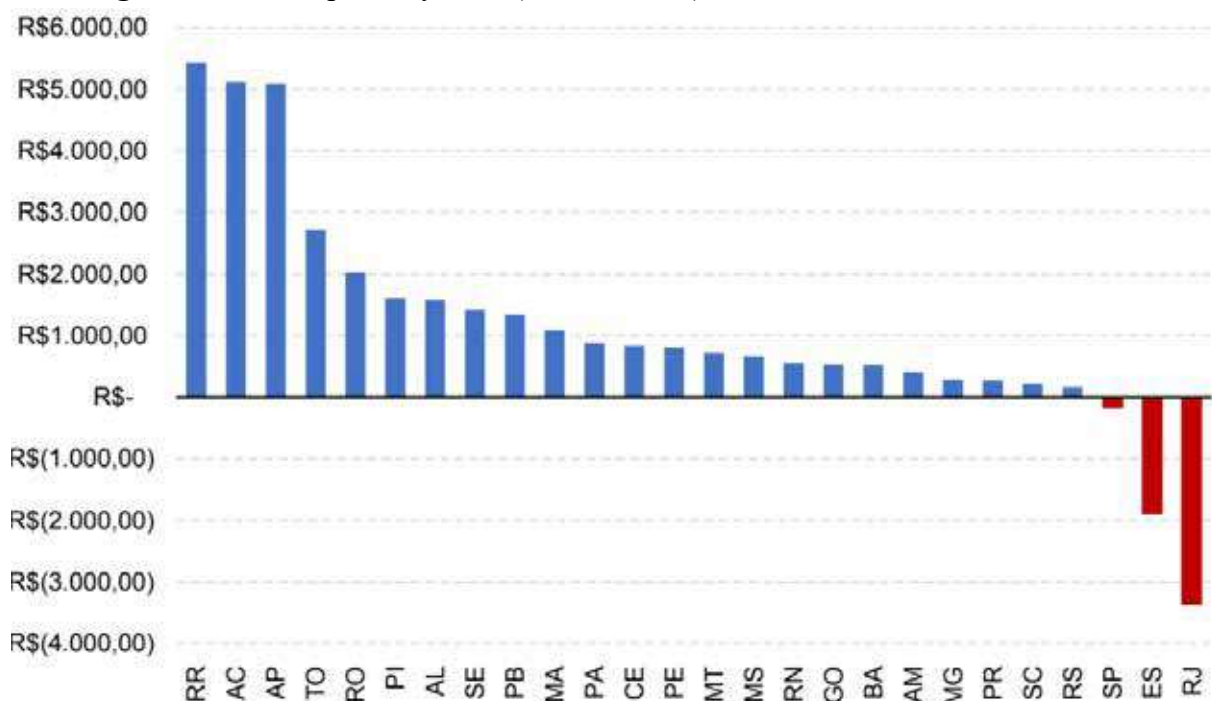
Following the line that defends public investment as an important tool for driving growth and mitigating regional and social disparities to the detriment of the line that argues that the market should define investment, in a ranking of each state's investments as a ratio of ICMS in percentage terms, Espírito Santo would be 16th, Rio de Janeiro 19th and São Paulo 23rd. In other words, even with this benefit maintained by the legal act, the states with the largest share of royalties don't seem to have made use of this benefit to increase their prominence as public investors in relation to the other states. In other words, while São Paulo invested 5.5% of the ICMS, Rio de Janeiro 9.0% and Espírito Santo 10.0%, Acre led this ranking, investing 39.3% of the ICMS, followed by Alagoas (22.8%), Piauí (21.7%), Roraima (19.9%) and Ceará (19.9%).²⁰

According to Figure 4.3, Roraima and Acre are among the 4 states with the highest ratio between royalty credits and investments, even though they stand out as public investors.

If the amount of the credit was repaid, Amapá could increase its investments over the next decade by 191.7%, followed by Roraima (148.9%), Rondônia (77.9%) and Acre (74.6%).

To conclude this comparative analysis of the capacity to pay and the benefits that could be generated in terms of increased revenue or investments by the states, Figure 4.4 shows the values of the credits and debits of royalties accumulated over a decade per capita, if they were paid in full to the current population at the end of 2022.

Figure 4.4. Per Capita Royalties (Dec/2022 R\$)



Note: Values from 2013 to 2022. Source: Own Elaboration and IPEADATA

It is possible to identify the states of the North region among the 5 with the highest level of credit per capita, with values exceeding R\$ 2,000.00, as well as many states in the Northeast with credit per capita exceeding R\$ 1,000.00. The per capita amounts of debt in Rio de Janeiro and Espírito Santo are in the order of almost R\$ 3,400.00 and R\$ 2,000.00, respectively.

All the comparative analysis carried out so far was aimed, on the one hand, at measuring the impact on the public accounts of the debtor states if this accumulated debt was paid off, as well as the effect on the revenue and investments of the creditor states.

The next analysis is based on the question, which is also comparative, of the social and economic characteristics of the states that have benefited or suffered most from the suspension of Law 12.734/2012.

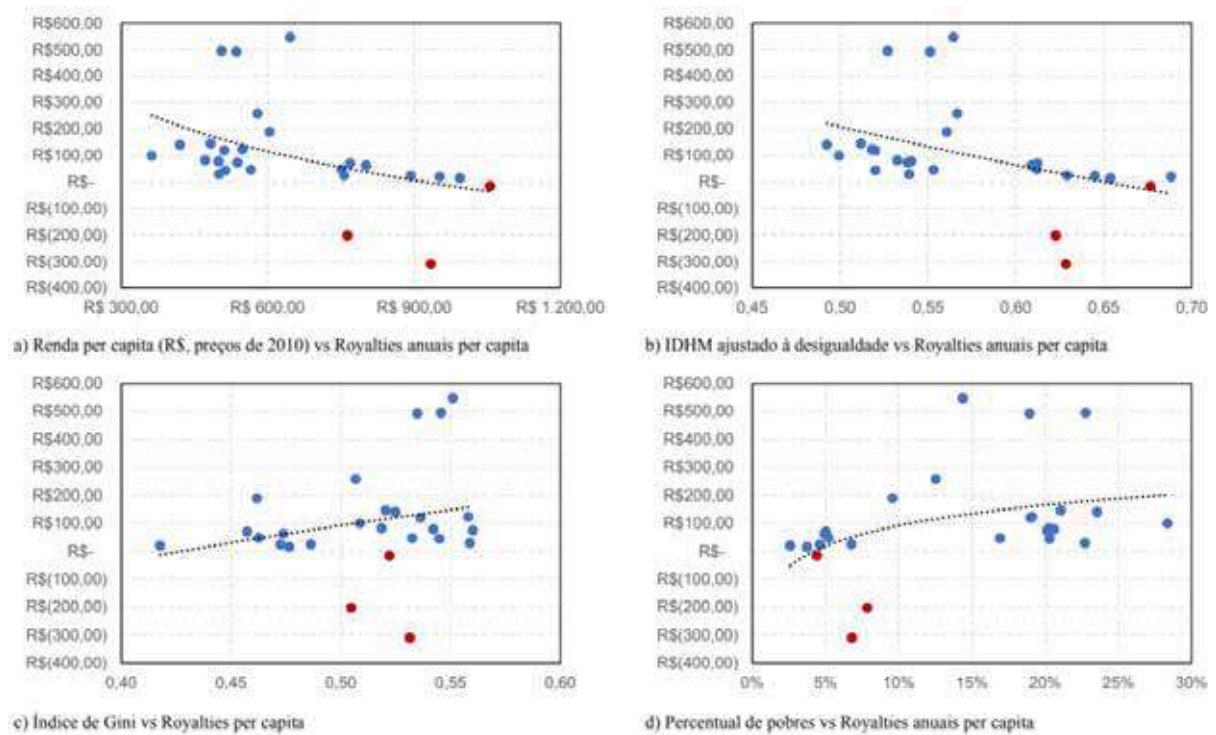
In this context, Figure 4.5 reports scatter plots of the 26 states involved, considering on the vertical axis the value of the average annual royalties divided by the average population, between 2013 and 2021, while the horizontal axes explore the average values over the same period of the following variables, respectively: per capita income, inequality-adjusted MHDI, Gini inequality index and percentage poor population². Common to all 4 scatter plots is the use of blue colors for the states with credit, and red for the three states with debts.

Looking at the upper graphs, the negative correlations between income and royalties (-0.45) and between MHDI and royalties (-0.42) are more clearly evident in both dispersions, and it is possible to identify a reasonable *fitting* of a simply logarithmic trend, with only three outliers at the top and two outliers at the bottom. In other words, the states that would benefit the most from the retroactive payment of royalties accumulated between 2013 and 2022 are those with the lowest per capita income and the lowest human development index, while the states that benefit the least or need to pay the debt have per capita income or GDP, and HDI among the best in the country.

The analysis at the bottom reinforces the socio-economic role of reviewing the suspension of a decade ago, with retroactive and future effects, as it is again possible to identify that, in addition to the positive correlations between royalties and the Gini (0.24) or between royalties and poverty (0.39), there is also a logarithmic trend with a satisfactory fit. This evidence suggests that, despite the existence of occasional upward or downward outliers, the more unequal and the higher the percentage of poor people in the population, the greater the average real annual benefits from past royalties. Similarly, states with lower per capita benefits, as well as states with debt, are those with lower poverty indicators. This context needs to be taken into account when reviewing this legal act, which could be fundamental for improving the social situation of the neediest states.

2 The most recent data on the variables available from IPEADATA for the states is for 2021.

Figure 4.5. Dispersion Between Per Capita Royalties by Year (Dec/2022 R\$) and Socio-economic Variables



Note: Values from 2013 to 2021, the Most Recent Year for Socioeconomic Variables.

Source: Own Elaboration and IPEADATA.

5. CONCLUSION

The transfer of federal resources to state and municipal governments plays a key role in promoting social equity and regional development in the country, acts as a catalyst for economic development in less developed areas, softens negative shocks to the economy during periods of economic crises or social emergencies, and can strengthen the administrative and fiscal capacities of these governments.

Considering this strategic importance, this discretionary or constitutional source of resources is now part of the list of variables involved in the fiscal war in Brazil. In this context of federal bargaining associated with the legal conflict aimed at regulating the distribution of certain sources of resources from the perspective of constitutional transfers, this study looks at the distribution of part of the oil royalties among state governments over the last decade. In short, in 2013, Direct Action for Unconstitutionality (ADI) 4917 challenged the constitutionality and suspended the effects of Law 12.734/12, which aimed to establish a new way of distributing oil royalties among the states, making the distribution more advantageous for non-producing

states.

As a first product, the study measures the amount to be received or paid by each state in accordance with Law 12.734/12 during the period between 2013 and 2022. As a second product, the study measures its relevance by comparing it with ICMS revenue, analyzes the possible impacts of these revenues via transfers on investments, and suggests a relationship between the values of royalties and some of the main socio-economic indicators.

A map of the country shows the concentration of states with access to the coast in the Southeast region as the ones that have benefited from the temporary suspension, with Rio de Janeiro leading the way. This map also suggests that the accumulated real values from 2013 to 2022 range from R\$1.62 billion for the state of Santa Catarina to R\$7.84 billion for the state of Pernambuco. The map also identifies a concentration in the Northeast of the states with the highest absolute real amounts to be received (reasons also given in the previous section), in addition to Pernambuco, Bahia, Maranhão and Ceará stand out, as well as Pará in the North. The credit of each of these states is over R\$7 billion.

The first extremely relevant conclusion of this work is that when you add up the credit values of the 23 states, you get a total of R\$103.14 billion, while the sum of the debts is R\$74.87 billion. The answer to this difference lies in the fact that the federal pact associated with the sharing of royalties via the special fund included not only the 26 states, but also the 5,500 municipalities and the federal government itself.

Therefore, if the vector of credit and debit values for all these federal entities were being reported here, the difference would be zero. Therefore, the positive difference of R\$28.27 billion allows us to conclude that, in a current scenario now in 2023, in which this past from 2013 to 2022 would be legally compensated, that is, the monocratic act suspending the transfers would be rejected, and all the amounts from this period would be compensated by annual inflation, in order to credit the 23 states, it would be necessary to pay the debts not only of Rio de Janeiro, São Paulo and Espírito Santo, but also the debts of the municipal governments that were favored by the suspension, and especially the debts of the federal government, whose share represents the majority of this difference of more than R\$28 billion.

A second conclusion concerns the states with debts. It should be noted that it is entirely feasible that São Paulo will be able to repair the accumulated effects of around R\$8.32 billion, since this represents 0.4% of the last decade's revenue from ICMS alone. Espírito Santo has a debt of around 5.6% of its main tax revenue, which may suggest the need for some kind of installment payment, and the same is true of Rio de Janeiro, whose debt represents 12.5% of

this source of revenue. In all three cases, an installment plan for the debt accumulated over a decade does seem feasible.

A third conclusion is associated with the order of magnitude of the royalty credit in terms of revenue. Thus, the 15 federal entities with the highest value of royalties as a fraction of ICMS are all from the North and Northeast regions. Only the state of Amazonas stands out slightly, coming after the states of the Center-West. It is important to highlight the order of magnitude of this credit in the states of Amapá (37.5%), Roraima (29.7%) and Acre (29.3%).

A fourth conclusion, on the relationship between investments and the credit/debit of royalties, suggests that in a ranking of investments as a ratio of ICMS, Espírito Santo would be 16th, Rio de Janeiro 19th and São Paulo 23rd. In other words, even with this benefit maintained by the legal act, the states with the largest share of royalties do not seem to have made use of this benefit to increase their prominence as a public investor in relation to the other states. In other words, while São Paulo invested 5.5% of ICMS, Rio de Janeiro 9.0% and Espírito Santo 10.0%, Acre led this ranking, investing 39.3% of ICMS, followed by Alagoas (22.8%), Piauí (21.7%), Roraima (19.9%) and Ceará (19.9%). Roraima and Acre are among the 4 states with the highest ratio between royalty credits and investments, even though they stand out as public investors. If the credit was paid out, Amapá could increase its investments over the next decade by 191.7%, followed by Roraima (148.9%), Rondônia (77.9%) and Acre (74.6%).

A fifth conclusion analyzes royalties in per capita terms, and it can be inferred that the states in the North are among the 5 with the highest per capita credit levels, with amounts exceeding R\$ 2,000.00, as well as many states in the Northeast with per capita credit exceeding R\$ 1,000.00. The per capita amounts of debt in Rio de Janeiro and Espírito Santo are in the order of almost R\$ 3,400.00 and R\$ 2,000.00, respectively.

A sixth conclusion associates royalties and some socio-economic indicators, showing that the negative correlations between income and royalties (-0.45) and between MHDI and royalties (-0.42) are more clearly evident in both dispersions, and it is possible to identify a reasonable *fitting* of a simply logarithmic trend. In other words, the states that would benefit most from the retroactive payment of royalties accumulated between 2013 and 2022 are those with the lowest per capita income and the lowest human development index, while the states with the lowest benefit or that need to pay the debt have per capita income or GDP, and HDI among the best in the country.

The seventh and final conclusion suggests and reinforces the social importance of correcting what has happened over the last decade with royalty payments, as it is again possible

to identify that in addition to the positive correlations between royalties and the Gini (0.24) or between royalties and poverty (0.39), there is also a logarithmic trend with a satisfactory fit. This evidence suggests that the more unequal and poorer the state, the greater the average annual benefits from past royalties. Similarly, states with lower per capita benefits, as well as states with debt, have lower poverty indicators.

This context needs to be taken into account when reviewing this legal act, as it is fundamental for improving the social situation of the neediest states.

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APPENDIX
Table A.1. Value of Royalties in Current R\$ (Credit/Debit)

UF/ANO	2013		2014		2015		2016		2017	
AC	R\$	181.400.504,13	R\$	210.810.613,35	R\$	154.979.056,31	R\$	159.034.495,92	R\$	251.409.016,81
AL	R\$	189.016.940,78	R\$	219.362.997,34	R\$	160.914.418,19	R\$	163.486.213,06	R\$	300.397.544,79
AM	-R\$	106.637.050,75	-R\$	112.588.747,65	-R\$	77.536.643,21	R\$	5.582.256,28	R\$	110.273.050,66
AP	R\$	180.923.273,56	R\$	210.256.010,46	R\$	154.571.335,76	R\$	145.674.718,72	R\$	220.387.789,62
BA	R\$	240.652.300,39	R\$	308.993.032,07	R\$	241.511.319,45	R\$	192.049.372,93	R\$	403.273.213,48
CE	R\$	369.895.171,76	R\$	434.682.681,48	R\$	320.848.903,21	R\$	260.091.964,38	R\$	424.398.907,47
ES	-R\$	464.876.774,51	-R\$	582.874.653,19	-R\$	444.489.560,10	-R\$	405.498.951,52	-R\$	542.495.236,22
GO	R\$	150.757.022,46	R\$	175.198.963,64	R\$	128.798.876,07	R\$	115.108.565,29	R\$	195.737.552,47
MA	R\$	361.847.815,04	R\$	394.118.503,06	R\$	290.773.669,46	R\$	246.467.398,03	R\$	418.424.224,17
MG	R\$	236.202.439,32	R\$	274.497.479,59	R\$	201.798.949,79	R\$	183.347.852,88	R\$	288.661.578,24
MS	R\$	70.630.072,08	R\$	82.081.186,28	R\$	60.342.619,91	R\$	71.862.910,70	R\$	141.803.626,38
MT	R\$	122.377.732,13	R\$	142.218.595,09	R\$	104.553.102,46	R\$	82.124.391,88	R\$	149.345.433,46
PA	R\$	324.092.335,12	R\$	376.636.793,76	R\$	276.887.457,58	R\$	254.224.629,06	R\$	418.584.719,47
PB	R\$	253.934.192,17	R\$	295.104.047,51	R\$	216.948.028,14	R\$	180.388.931,46	R\$	284.324.153,44
PE	R\$	365.887.096,14	R\$	425.207.657,34	R\$	312.594.704,86	R\$	231.058.040,61	R\$	396.392.411,00
PI	R\$	229.144.734,84	R\$	266.295.523,26	R\$	195.769.217,72	R\$	172.897.003,52	R\$	276.587.340,36
PR	R\$	146.223.189,36	R\$	169.184.339,71	R\$	125.210.427,43	R\$	92.331.740,46	R\$	174.103.645,20
RJ	-R\$	2.253.586.844,41	-R\$	2.596.114.580,67	-R\$	1.740.707.221,50	-R\$	1.545.434.041,12	-R\$	3.146.760.672,38
RN	-R\$	69.749.000,28	-R\$	34.363.100,53	R\$	10.673.943,23	R\$	38.582.990,31	R\$	115.985.869,08
RO	R\$	149.298.818,63	R\$	173.504.344,61	R\$	127.553.063,80	R\$	143.531.608,41	R\$	228.710.209,90
RR	R\$	131.540.552,25	R\$	152.866.965,51	R\$	112.381.334,43	R\$	111.414.411,50	R\$	150.856.506,56
RS	R\$	124.864.631,98	R\$	145.108.691,41	R\$	106.677.779,00	R\$	61.306.380,15	R\$	80.649.583,71
SC	R\$	67.862.135,20	R\$	78.864.491,04	R\$	57.977.841,51	R\$	60.506.627,27	R\$	80.888.683,75
SE	R\$	53.147.713,10	R\$	79.806.800,67	R\$	90.418.574,63	R\$	75.045.136,44	R\$	174.228.127,51
SP	-R\$	72.133.170,15	-R\$	207.294.539,94	-R\$	326.703.346,47	-R\$	293.256.935,13	-R\$	623.364.313,18
TO	R\$	230.131.010,56	R\$	267.441.701,84	R\$	196.611.839,73	R\$	142.545.919,86	R\$	232.222.007,52
UF/ANO	2018		2019		2020		2021		2022	
AC	R\$	459.036.767,01	R\$	461.538.037,22	R\$	354.237.842,87	R\$	675.484.888,51	R\$	951.954.947,68
AL	R\$	525.485.400,32	R\$	536.760.910,69	R\$	436.293.782,59	R\$	815.707.267,42	R\$	1.092.278.334,53
AM	R\$	283.135.633,86	R\$	253.676.745,93	R\$	244.983.335,40	R\$	408.813.200,86	R\$	651.427.323,60
AP	R\$	411.203.830,81	R\$	388.056.642,94	R\$	370.398.683,31	R\$	681.338.093,02	R\$	971.345.907,18
BA	R\$	775.085.657,47	R\$	757.966.076,19	R\$	659.762.563,67	R\$	1.219.772.422,79	R\$	1.768.662.161,71
CE	R\$	732.401.753,22	R\$	702.680.277,31	R\$	596.565.502,85	R\$	1.063.804.090,21	R\$	1.421.593.707,45
ES	-R\$	697.228.058,03	-R\$	859.727.538,40	-R\$	533.666.092,24	-R\$	965.907.803,39	-R\$	635.013.503,70
GO	R\$	373.027.226,72	R\$	302.101.482,62	R\$	281.974.350,49	R\$	589.684.209,70	R\$	859.433.004,35
MA	R\$	717.946.399,23	R\$	731.267.600,90	R\$	613.850.139,90	R\$	1.059.808.855,79	R\$	1.537.905.312,46
MG	R\$	580.713.085,93	R\$	554.942.541,75	R\$	461.144.874,95	R\$	877.641.700,28	R\$	1.251.949.367,28
MS	R\$	177.784.604,33	R\$	191.706.910,08	R\$	144.135.480,89	R\$	258.346.303,15	R\$	351.399.691,04
MT	R\$	268.827.366,13	R\$	229.245.343,04	R\$	176.756.763,81	R\$	354.176.748,60	R\$	467.284.861,76
PA	R\$	738.291.159,92	R\$	738.283.821,02	R\$	579.624.929,94	R\$	1.115.263.416,57	R\$	1.537.446.994,82
PB	R\$	512.723.721,14	R\$	458.183.486,22	R\$	410.005.265,51	R\$	749.040.900,87	R\$	1.108.048.121,66
PE	R\$	716.919.485,25	R\$	723.869.618,53	R\$	611.574.640,05	R\$	1.080.500.301,07	R\$	1.609.719.534,45
PI	R\$	497.859.847,94	R\$	501.483.529,39	R\$	411.020.440,33	R\$	762.521.860,23	R\$	1.067.818.804,08
PR	R\$	276.196.411,10	R\$	253.096.335,59	R\$	199.952.315,73	R\$	429.583.376,29	R\$	704.349.697,14
RJ	-R\$	6.022.171.509,20	-R\$	5.922.311.796,92	-R\$	4.674.794.412,35	-R\$	9.268.212.735,92	-R\$	11.925.738.378,44
RN	R\$	237.971.313,14	R\$	299.628.255,39	R\$	245.026.557,23	R\$	413.463.652,88	R\$	538.514.211,40
RO	R\$	396.094.309,32	R\$	372.798.856,42	R\$	266.973.975,43	R\$	509.557.142,28	R\$	655.828.675,29
RR	R\$	282.928.666,00	R\$	339.278.670,43	R\$	226.001.270,14	R\$	594.922.599,50	R\$	903.511.850,51
RS	R\$	159.109.717,17	R\$	135.692.609,46	R\$	148.649.350,15	R\$	215.077.979,89	R\$	324.311.637,71
SC	R\$	168.818.241,38	R\$	117.602.409,57	R\$	126.524.059,71	R\$	209.174.538,36	R\$	380.056.416,32
SE	R\$	327.779.300,39	R\$	368.662.525,87	R\$	306.627.977,62	R\$	571.193.325,70	R\$	802.876.299,94
SP	-R\$	1.048.016.680,35	-R\$	954.615.516,17	-R\$	571.770.368,01	-R\$	1.256.427.716,46	-R\$	1.678.291.173,24
TO	R\$	417.530.702,10	R\$	387.317.079,05	R\$	301.329.538,57	R\$	583.085.130,06	R\$	797.507.372,06

Note: Source: Own Elaboration.