

Political Determinants of Fiscal Centralization: empirical evidence from Brazil*

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Abstract

This paper examines the theory of the median voter as an explanatory model of the choices of fiscal design in federal systems. According to this model, representatives governments support fiscal centralization when this decision corresponds to the preference of their median voter. This model is discussed in connection with the decisions adopted by the Brazilian Constitutional Convention of 1988 regarding fiscal design. From this discussion, the paper proposes an alternative explanation for the choices of fiscal designs, which takes into account not only the preference of the median voter for levels of taxation, but also the preferences of local government representatives for fiscal designs that involve an increase in revenue for the local government and, primarily, do not impose revenue losses or risks of revenue losses when compared to the *status quo*.

1. Introduction

There are many studies on comparative politics in the specialized literature about federal states that deal with the effects of fiscal or political decentralization. Fiscal decentralization refers to the distribution of authority among the central government and

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subnational units to tax and to spend. Political decentralization can be understood as either the formation of local governments through their own elections or the distribution of decision-making authority over certain policies between the central government and the subnational units ([Rodden, 2005](#)).

Seminal works by authors associated with the theory of public choice and the political economy of welfare underline the beneficial effects that could result from the implementation of political structures with decentralized political and fiscal authority. These works argue that decentralized governments would be more appropriate, be it is because they allow for heterogeneous preferences held by the population to be revealed, problems with information asymmetry to be avoided, public goods to be provided more efficiently, or because such arrangements protect the market and the population against government interventions and expropriations of rights by the government ([Tiebout, 1956](#); [Weingast, 1995, 2007, 2009](#); [Buchanan, 1996](#); [Inman and Rubinfeld, 1997](#); [Qian and Weingast, 2011](#)). These arguments have developed from a key assumption about the mobility of people and capital among the subunits ([Tiebout, 1956](#)). This mobility allows for the preferences of the population to be revealed and, since it is understood that local government leaders want to satisfy the preference of their voters, they can allocate the resources more efficiently.

Some of the beneficial consequences of the implementation of political and fiscal decentralization have been questioned by several authors ([Paterson and Rom, 1990](#); [Peterson, 1995](#); [Prud'homme, 1995](#)). If there is mobility of people and capital, decentralization may result in a competition between the subunits to provide the least amount of social welfare policies so as not to attract migration of the poor population from other jurisdictions to their localities ([Peterson, 1995](#)).

In the former literature as well as in the later one, the decentralization of authority over policies appears as a causal exogenous variable in relation to the inequalities.

Taking centralization as the dependent variable, the traditional view assigns the political actors from the wealthiest regions positions in favor of decentralization, while the poorest regions prefer centralization as a means to raise resources through redistribution among regions. Thus, such preferences, let us say, the one of wealthier regions, can be transformed into decisions when a federal state institutionalizes the veto power of subnational units. If certain subunits, even if they represent a minority of the population, have veto power, they could skew the decisions in their favor at the expense of reforms that correspond to the preferences of the broader national population (Stepan, 1999).

However, such notions about the preferences of the regions for centralization or decentralization, fundamentally based on the distribution of income, appear to have been inadequate to explain the large empirical variation found in the fiscal design of the federal states (Beramendi, 2012). It is worth citing the examples pointed out by Beramendi (2007, 2012) about choices on fiscal designs that occurred in Canada and the United States after the Great Depression in the late 1920s and 1930s. Both countries were faced with similar circumstances in terms of decentralization of insurance policies, patterns of inequality, and exposure to external influences. However they chose different paths: the United States decentralized the unemployment policies, while Canada opted for centralization. On that occasion, the poorest states in the United States were opposed to centralization even if it meant larger transfers from the wealthier regions. In Canada, on the other hand, as was the case in Germany after the reunification, the wealthy regions supported fiscal centralization despite the possibility

of loss of revenue through interregional redistribution (id.).

In the light of these examples, among others, the traditional view that wealthy regions are in favor of decentralization and poor regions are in favor of centralization begs to be reconsidered. Explanations must be reviewed or other variables must be included in order to match the theoretical propositions with the empirical observations. This path can be drawn in two ways: by changing the assumptions that provide information on the preferences of the actors, or by including intervening variables that influence the translation of preferences into decisions.

More recently, the comparative literature has pointed out the inverse causal direction, or to say it better, the endogenous one. Income distribution appears to be an explanatory variable in whether or not to implement decentralized political and fiscal structures of authority ([Bolton and Roland, 1997](#); [Wibbels, 2005](#); [Sambanis and Milanovic, 2009](#); [Alesina and Spolaore, 2003](#)). The current distribution of income is precisely what matters because the fiscal design may produce redistributive effects. This is the reason why “distributional concerns play a fundamental role in shaping the organization of fiscal structures” in federal states ([Beramendi, 2012](#), p.6).

In the context of this debate, [Beramendi \(2007\)](#) presented a model that intended to explain the preference of the representatives and the results of the decision-making process when fiscal centralization is at stake. According to the author’s model, the preference of the representatives for fiscal designs depends as much on intra-regional and interregional income distribution as it does on the preferences for levels of insurance policies against the risk of job loss. The preferences of the representative will reflect the preference of their local median voter. The current distribution of income is precisely what matters because the fiscal design may produce redistributive effects. This is the

reason why "distributional concerns play a fundamental role in shaping the organization of fiscal structures" in federal states (Beramendi, 2012, p.6).

From that formulation, this paper has two objectives. The first is to discuss this hypothesis on the preferences of representatives for fiscal designs based on the decisions that were made by Brazilian Constitutional Convention of 1988. The second is to test it through empirical analysis of the decisions that were made in 1989 concerning the sharing of tax revenue from the States Participation Fund (FPE) among the states, following the decisions on fiscal design made at the Constitutional Convention of 1988. These decisions have governed the revenue sharing of the FPE fund from 1989 until 2012.

The Constitutional Convention of 1988 served as a great opportunity to rebuild the fiscal and political design of the Brazilian federation. It largely maintained the previous centralized fiscal structure. However, it introduced a significant change as to the sharing of tax revenue, which increased its decentralization. In other words, constitutional transfers to subnational units increased in relation to what had previously occurred. Considering state level, the significant increase of transfers from the States Participation Fund (FPE) was the most important among these changes due to its size and redistributive power. The FPE fund has an overwhelming power to mitigate the inequality of expenditure capacity of the states in Brazil and is the largest redistributive transfer to the states. This transfer is defined in the 1988 Constitution and in the Law 62/89. It is thus necessary to revert to the time when these rules were approved in order to understand their political determinants. In doing so, we are able to understand the political factors behind one of the most important redistributive characteristics, at the state and regional level, of the Brazilian fiscal structure. Furthermore, this

investigation contributes to the advancement of the theory of fiscal choice because it is closely related to fiscal centralization.

As will be argued below, the empirical analysis shows the Beramendi's (2007) model predicts the coalition in the Constitutional Convention fairly well. However, at a closer look, it neither provides a total understanding of the position of certain states on the decisions in question nor allows us to understand the dynamics of the decision-making process that actually happened. The empirical analysis discloses other important factors involved. I argue that in order to determine the preferences of regional actors for a specific fiscal design, it is necessary to include the calculation of the impact on the local government budget that the proposed new structure will cause in relation to the status quo. Regional actors will support reforms that involve an increase in their government revenue or an increase in authority over their main source(s) of revenue. However, they will oppose reforms that jeopardize their budget, be it through immediate loss of revenue, or through risks to future revenue. Secondly, I argue that the decision-making rules play an important role in relation to how sufficient the preferences are in defining the final results. The strategic behavior of these actors depends on these rules.

The rest of this paper is structured as follows. The next section presents and discusses the theoretical model of Beramendi (2007) and applies it to the Constitutional Convention of 1988, which is also valid for 1989, given that the actors were the same and the values of the variables described in the model had not changed between these two moments. That will provide us with the distribution of preferences predicted by the model. Then I discuss the decisions on the sharing of the FPE fund, which lead to Supplementary Law nº 62 of 1989. Lastly, I present the conclusion.

2. Determinants of regional actors' preferences for fiscal decentralization

In order to explain decisions on fiscal centralization or decentralization, [Beramendi \(2007, 2012\)](#) presents an analytical model that aims to determine the regional actors' preferences. First, his model assumes that political actors in democratic governments are motivated by electoral interests. Regional political actors seek electoral support from voters in their localities. Thus, the relevant voter's preference in the locality will be a determining factor in the regional political actor's preference. [Beramendi \(2007\)](#) adopts the median voter theory, as applied by [Bolton and Roland \(1997\)](#) and by [Alesina and Perotti \(1998\)](#). In this case, the relevant voter is the median voter and, therefore, his preference is what matters. Since decisions are related to fiscal design, the relevant preference defined in the model is the preference for levels of taxation or redistribution¹.

The appropriate level of redistribution for a median voter in a given region depends on two elements: the difference between average income and median income will determine the desired level of income redistribution. Given two regions with the same average income, the one whose median voter has a lower income in relation to the average income tends to prefer higher levels of income redistribution. The second element is the distribution of the risk of income loss, or the risk of job loss². If there are higher risks of job loss, the preference for insurance policies increases and, consequently, so does the preference for higher levels of redistribution ([Beramendi,](#)

¹[Beramendi \(2007\)](#), following [Alesina and Perotti \(1998\)](#), has adopted that redistribution is a linear function of taxation. In such context, reference to either taxation or redistribution are interchangeable.

²In the model, the author assumes that the risk of job loss is directly associated with the region's degree of economic specialization. The higher the specialization, the greater the risks of losing income.

2007; Iversen and Soskice, 2001; Estevez-Abe et al., 2001). Together, these two factors are what configure the *territorial structure of inequality*, which will determine the preference for higher or lower levels of taxation, be it for the redistribution of income, or the adoption of insurance policies against local labor market risks.

When the decision regarding centralization is in question, the regional actor compares the distributive consequences of the adoption of a centralized fiscal design or a decentralized fiscal system in terms of these two factors, and will thus support the design that is aligned with the distributive consequences expected. This theoretical formulation has been developed into a formal model that quantifies the preference of the median voter and, as a result, the one of the locality for decentralization of fiscal authority. This preference is obtained by the following formula (for more details see Beramendi (2007)):

$$E[U_d^m(c)] - E[U_c^m] = \frac{1}{2}(y - y_\mu) + \frac{\beta w^m(2\beta w^m - \lambda y - \theta)}{2(\lambda y + \theta)} - \frac{\beta w_\mu^m(2\beta w^m - \lambda y - \theta)}{2(\lambda_\mu y_\mu + \theta_\mu)} \quad (1)$$

where $E[U_d^m(c)]$ is the average utility of the regional median voter if the level of taxation were the one adopted by the region in the event of decentralization; $E[U_c^m(c)]$ is the average utility of the regional median voter if the level of taxation were the one adopted by the Union in the case of centralization; β is the proportion of the population that is employed; λ represents the proportion of the population that is unemployed; y represents the GDP per capita; w represents the median voter income; σ is the indicator for the diversification of economic activity; $\theta = 2\beta(w^m)^2(1 + \sigma_z^2)$

and $\theta_{\mu} = 2\beta(w_{\mu}^m)^2(1 + \sigma_{z\mu}^2)$ are, respectively, the terms that capture the individual's risk of income loss at the regional and union level. Subscript μ indicates a variable that is measured at union level, and the absence of a subscript indicates a variable that is measured at regional level.

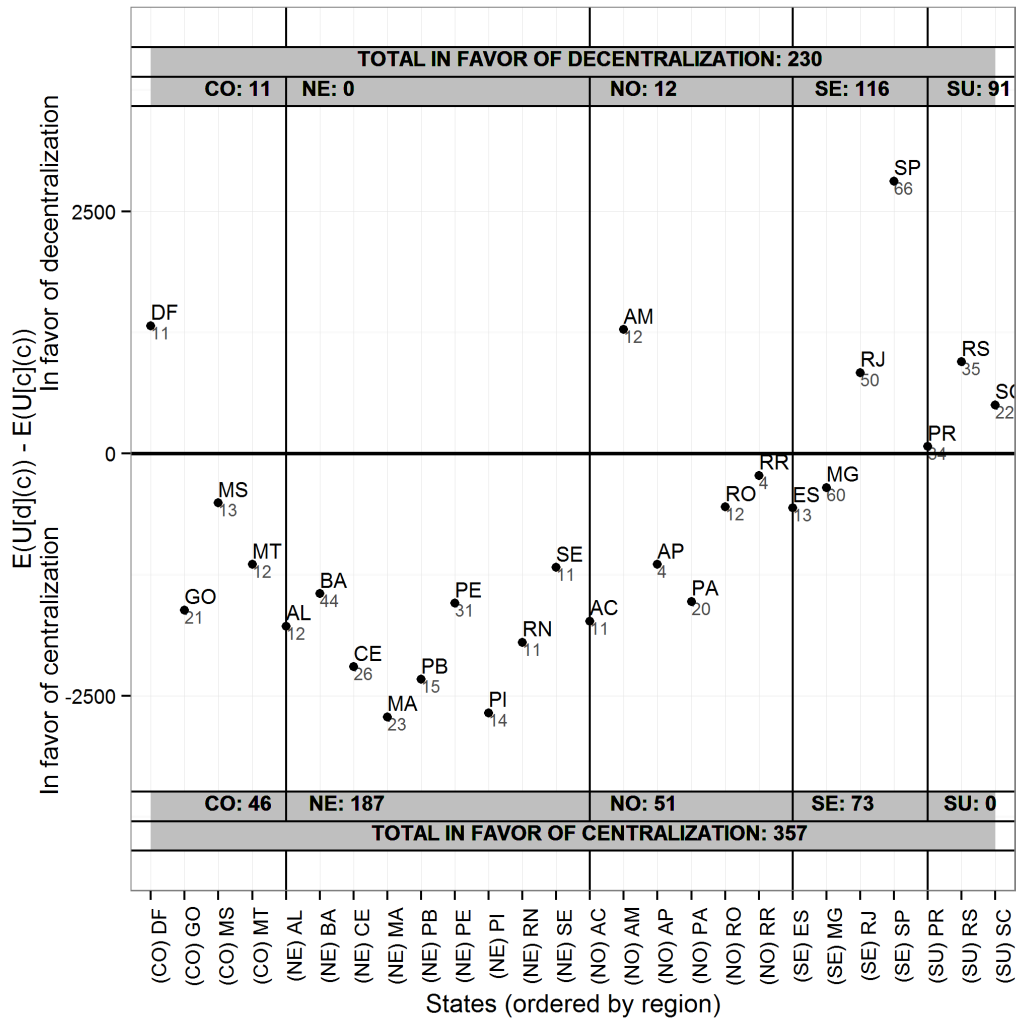
From this model, we can calculate the preferences for redistribution for each state of the federation at the Constitutional Convention of 1988 and, as a result, deduce which states, in this model, apparently had incentives to support centralization.

There were 587 legislators, which included deputies and senators from the 26 Brazilian states, at the beginning of the Constitutional Convention in 1987³. Figure 1 represents the distribution of the states' preferences (the variables used in the analysis are described in appendix A.1). As the equation (1) indicates, values higher than zero represent preferences for decentralization. For positive values, the further away from zero, the more the state supports decentralization. For negative values, the further away from zero, the more the state prefers centralization. The number located below the state abbreviation represents the quantity of chairs each state held at the Constitutional Convention. The states are ordered by its regions in the figure: South (SU), Southeast (SE), North(NO), Northeast (NE), and Center-West (CO).

As Figure 1 indicates, it would be expected that all states from the South (SU) region (Rio Grande do Sul - RS, Santa Catarina - SC, and Paraná - PR), as well as São Paulo (SP), Rio de Janeiro (RJ), Amazonas (AM), and the Federal District (DF), would be expected to oppose fiscal centralization. The model predicts that a total of 230 legislators would oppose centralization (those positioned above zero in figure 1),

³The 27th state Tocantins were created in 1988.

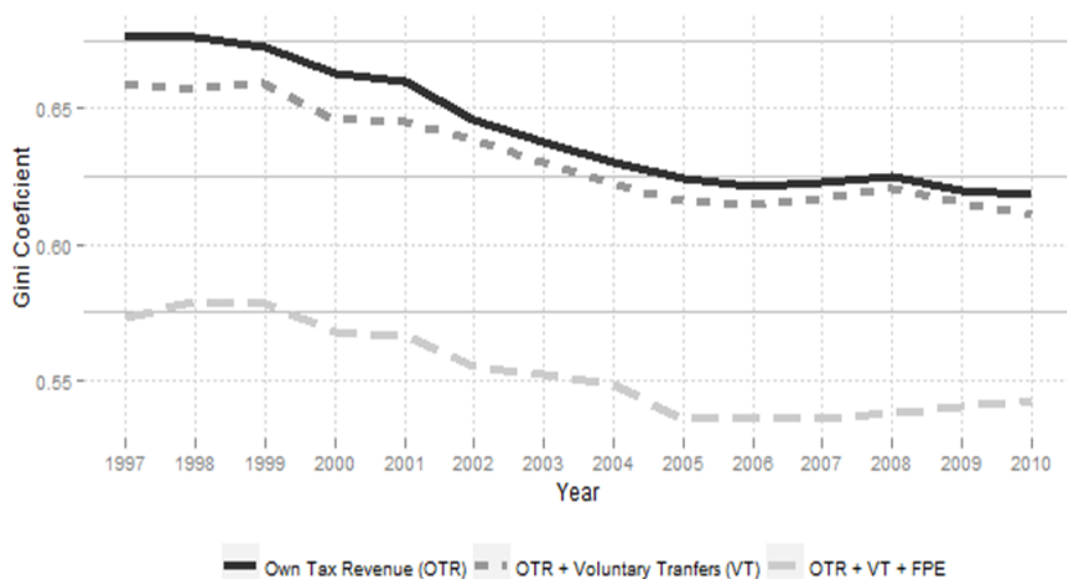
Figure 1: State preferences for the decentralization of fiscal policy



while 357 legislators would be in favor of it.

The following section discusses the decision-making process that resulted in the decisions on decentralization of tax revenue, more specifically, interregional distribution of tax revenue among states through the FPE fund, thus presenting the elements for empirical analysis for the subsequent section. That section will empirically analyze the decisions on the sharing of tax revenue from the FPE fund, which took place in 1989.

Figure 2: Effect of the transfers in the difference of expenditure capacity of the states



3. The redistribution of tax revenue among states at the Constitutional Convention of 1988

As pointed out the Constitutional Convention of 1988 served as a great opportunity to rebuild the fiscal and political design of the Brazilian federation. It largely maintained the previous centralized fiscal structure. However, it introduced a significant change into the constitutional text as to the sharing of tax revenue, which increased its decentralization. Concerning the states, the significant increase of transfers from the States Participation Fund (FPE) was one of the most important among these changes due to its size and redistributive power. Figure 2 shows its relative importance to the budget of the states. As can be seen, the FPE fund has an overwhelming power to mitigate the inequality of expenditure capacity of the states in Brazil.

The term States Participation Fund (FPE) was first introduced through constitu-

tional amendment (EMC) n° 18 of 1965. The fund collection base already consisted of two federal taxes, which also form its collection base at present: income tax (IR) and tax on industrialized products (IPI). The major changes that occurred over time in the federal subunits constitutional revenue sharing funds were related to the percentages of IPI and IR that would be distributed and the share allocated to each fund. These changes are described in Table 1.

Table 1: Distribution of IPI and IR to the Revenue Sharing Funds

Legislation	Period		% IPI and IR to FPE	Fund		
				FPE	FPM	FE
EC n° 18 de 1965 ^a	1967	1968	20%	10%	10%	–
AC n° 40 de 1968 ^b	1969	1975	12%	5%	5%	2%
EC n° 5 de 1975	1976	1980	20% ^c	9%	9%	2%
EC n° 17 de 1980	1981	1983	24% ^c	11%	11%	2%
EC n° 23 de 1983	1984	1985	32%	14%	16%	2%
EC n° 27 de 1985	1986	1988(CF)	33%	14%	17%	2%
CF 1988 (art. 159)	1989	2007	47% ^c	21.5%	22%	3%
EC n° 55 de 2007	2008	2012	48%	21.5%	23%	3%

Source: www.camara.gov.br; www.planalto.gov.br; Souza (2011); Rocha (2010); Afonso (2010); MF-STN (2005, 2011). Prepared by the author.

EC: constitutional amendment; AC: Supplementary act; LC: Supplementary law; DL: Decree-law

^a Creation of the FPE fund and of the Municipalities Participation Fund (FPM).

^b Creation of the Special Fund (FE), which was regulated by Decree-law n° 835 of 1969.

^c The Law predicts a progressive annual increase until it reaches its final value.

As table 1 shows, the revenue sharing funds reached 33% of the IPI and the IR, with 14% of this share allocated to the FPE fund. The Constitutional Convention redefined the overall percentages of IPI and IR for the constitutional funds from 33% to 47%. It represents an increase of 42.4%. In addition to that, it also redefined the share allocated to the FPE fund from 14% to 21.5%, which represents an increase of

53.6%.

According to (Leme, 1992, p.184-5), the federal issue on decentralization at the Constitutional Convention mainly revolved around the sharing of tax revenue. The main agreement that defined the fiscal chapter took place in the committee and subcommittee that were responsible for defining of the fiscal chapter in the Constitution⁴.

The bargains for the sharing of the revenue among states involved two dynamics. First, the state representatives joined together to ensure decentralization of Union resources. Second, states and regions had to negotiate among themselves on how this revenue would be shared. Leme (1992) points out that states were very successful at increasing the overall amount of transfers because, in addition to the few defenders of Union interests in the committee and subcommittee, the Union committed the strategic error of beginning negotiations late in the Systematization Committee, which is precisely where the Union expected it could impose its preference. By that time, the interregional agreements had already been formed (id. p. 148).

The dispute between the states over revenue sharing had two results. On the one hand, there was an increase in the overall amount of transfers. On the other hand, the dispute divided the interests and some impasses could not be resolved in the Constitutional Convention alone.

⁴The Constitutional convention of 1988, which occurred in a decentralized manner, was organized into eight Committees, with each being responsible for a theme. Each committee was subdivided into three subcommittees, also organized by theme. The subcommittees developed, voted on, and sent the approved draft related to its theme to their respective thematic committee. Each thematic committee then combined three thematic drafts approved in their respective subcommittees, evaluated it, and voted on the compiled draft. Each thematic committee then delivered the approved draft to the Systemization Committee. The Systemization Committee then joined the original parts from each committee in order to send a draft to be voted on at the final stage, in plenary, in two rounds. The Subcommittee for Taxing, Sharing, and Distribution of Revenue was responsible for the chapter on taxation and the related committee was the Committee for the Tax System, Budget, and Finances.

In Leme's view, the major dispute was between the states from the North (NO), Northeast (NE), and Central-West (CO) regions, which demanded more transfers, and the South (SU) and Southeast (SE) regions, which demanded decentralization and opposed high redistributive transfers. The former regions are the poorest ones, and the latter regions are the wealthiest ones. This dispute closely corresponds to the prediction of Beramendi's model about the states preferences. In fact, it was the formation of a low-income coalition that demanded redistribution (Rodden, 2009). The poorest states focused on the increase of the FPE fund as an instrument for redistribution and they wanted to guarantee this in the Constitution. The states from the South, especially Rio Grande do Sul (RS) felt undermined by the criteria for sharing the FPE fund proposed by the poorest regions. Rio Grande do Sul demanded an increase in the Reimbursement Fund for Exporting States (FR)⁵, through which it would greatly benefit and, according to its argument, such an increase would compensate for the losses from the future sharing of the FPE fund. The criteria for sharing the FPE fund, which were proposed in the subcommittee during the Constitutional Convention, excluded states with per capita income higher than the national average wage.

Although the states were able to increase the overall amount of transfers through the FPE fund, no criteria were approved in the subcommittee due to the disagreement between the state representatives over how much each state should receive. The draft of the fiscal chapter was sent to the committee with no written rule about how the FPE fund should be shared out among the states. In the Committee, the agreement on the FR fund by representatives from the North, Northeast, and Central-West regions served

⁵The FR fund was created in the Constitutional Convention of 1988 as a result of the interregional bargain over the FPE sharing rule. It is a federal fund which is transferred to the states. It is composed of a given percentage of the IPI.

as a bargaining chip to negotiate a higher transfer percentage of the FPE fund, which was then increased from 18.5% to 21.5%. The FR fund, which left the subcommittee with a transfer rate of 5%, was increased to 10% in the committee. The states from the South and Southeast regions supported more transfers of the FPE fund in exchange for support from the North and Northeast to approve the autonomy of the states to set the tax rates for ICMS (Leme, 1992, p.157), to decide fiscal rates or taxes when the Constitution don't rule it (residual power), and to ensure an increase of the FR fund. Leme states that "with regard to the strengthening of state tax autonomy, the representatives from the North, Northeast, and Central-West conceded in exchange for an increase in federal transfers. Thus, an accommodation of regional interests was promoted, whose result was to have the Union be the loser" (Leme, 1992, p.150, free translation).

However, there was neither an agreement reached in the Committee nor in any phase of the Constitutional Convention concerning the criteria for sharing the FPE fund among the states. The only thing they decided on at the time was the overall amount to be transferred. Furthermore, few changes actually occurred in the Systematization Committee and the plenary meetings related to federal transfers to the states and the states autonomy to decide on their fiscal policy. The main one, however, was that the Union could remove residual power from the states, but the transfer percentages that had been obtained were not reduced. Since the criteria for sharing the FPE fund was not agreed upon in the Constitutional Convention, they were postponed for supplementary legislation (Leme, 1992, p.164). The law that eventually regulated the criteria for sharing the FPE fund among the states and regions was Supplementary Law nº 62 of 1989. This law regulated the sharing of the FPE fund among states and

regions until 2012⁶. The following section aims to shed light on what changed between 1988 and 1989 so that the sharing criteria could be approved.

4. The Criteria for Sharing the FPE fund in Supplementary Law nº 62 of 1989

The criteria for sharing the States Participation Fund (FPE) among states were based on article 88 of the Brazilian National Tax Code of 1966 (Law nº 5172 of 1966). This code defined that 5% of the total fund would be distributed proportionally to the area of each state and the remaining 95% would be distributed proportionally through what the code denotes as participation coefficients for individual states. The coefficient for each state was determined through the multiplication of two factors defined in the Brazilian National Tax Code (CTN). One of the factors represented the percentage of the population living in that state, and the other was based on the inverse of per capita GDP of each state. Up to 1975, the sharing of the FPE fund was calculated by these state coefficients

Decree-law nº 1.434 of 1975 introduced regional criteria. This decree, drafted in the authoritarian period, maintained the formula of the coefficients for individual states from Law nº 5172 of 1966 and allocated 20% of the FPE fund exclusively to the North and Northeast regions while the rest of the fund was distributed among all of the states, including those from the North and Northeast. Another change in the criteria for revenue sharing was a result of Decree-law nº 1.723 of 1979, which extended the sharing of the FPE fund to the former regional territories of Rondônia, Roraima, and Amapá, which at the time were not legal states, but rather federal territories. Until

⁶The criteria for sharing the FPE fund should be reformed before 2013 due to the Supreme Court decision.

the Constitutional Convention of 1988, the criteria for sharing of the individual states was defined by the National Tax Code of 1966 in conjunction with the criteria from Decree-law nº 1.723 of 1979.

These criteria for revenue sharing were redefined by Supplementary Law nº 62 of 1989. Through its transitory provisions (Federal Constitution of 1988, article 161), the Constitution of 1988 defined that the criteria for sharing the FPE fund among the states and regions would be regulated through supplementary legislation, which eventually occurred through Law nº 62 of 1989. This law fixed the coefficients for individual states thus reserving 85% of the FPE fund exclusively for the North, Northeast, and, from then on, Center-West regions. The South and Southeast regions shared the other 15% of the fund (details of the coefficients for individual states and the summary of the calculation of these coefficients are in appendix [A.2](#)). The poorest states were the ones that benefited the most from this new rule (check [Table 4](#)).

Law nº 62 of 1989, which regulated the criteria for sharing the FPE fund, originated from Bill nº 104 of 1989 was presented by Federal Deputy, Firmo de Castro (PMDB/CE) in plenary in June 1989. From the time the bill was presented by Deputy Firmo de Castro (PMDB/CE) until it was finally approved in the Senate, not a single change occurred in the original criteria presented in the bill during any of the decision-making stages which it underwent. Amendments were not even presented during the approval processes. In the House of Representatives, the Constitution, Justice, and Editing Committee (CCJR), the Finance Committee (CF), and the Plenary Assembly all ruled on the bill.

The Committee of Finance was the main one in charge of analysing the bill. [Table 2](#) shows the composition of the Finance Committee per political party and region at

the time the bill was voted. Even with 46.4% of the committee's votes, representatives from the South and Southeast did not vote against the proposition.

Table 2: Composition of the Finance Committee per Region and Party when voting Law nº 62 of 1989

PDS	PDT	PFL	PMDB	PT	TOTAL (%)	
CO	0	0	1	1	0	7.1%
NE	2	0	5	4	0	39.3%
NO	0	1	0	1	0	7.1%
SE	0	1	1	6	1	32.1%
SU	1	0	1	2	0	14.3%
TOTAL(%)	10.7%	7.1%	28.6%	50.0%	3.6%	100.0%

Fonte: www.camara.gov.br, (DCD, 29/11/1989), quadro elaborado pelo autor.

During the approval process, political party leaders from different regions submitted an urgent request for an assessment of the material⁷. The bill was submitted to a symbolic vote at the Plenary Assembly and was easily approved. The composition of the Plenary Assembly at the beginning of the session, when the bill was voted, is summarized per region and political party in Table 3. As can be seen, at the Plenary Assembly, the South and Southeast regions totaled 41.6% of the deputies at the beginning of the session. According to the rules of the House of Representatives internal regulations, which were approved in September 1989, a supplementary law requires approval by the absolute majority of its house members.

According to Leme (1992) the North, Northeast, and Center-West regions failed

⁷The urgent request was signed by Ibsen Pinheiro (RS/Leader of the PMDB), Plínio Arruda Sampaio (SP/Leader of the PT), José Lins (CE/Vice Leader of the PFL), Aldo Arantes (GO/Vice Leader of the PCB), Artur Lima Cavalcanti (PE/Vice Leader of the PDT), Robson Marinho (SP/Vice Leader of the PSDB), Gerson Peres (PA/Vice Leader of the PDS).

Table 3: Composition of the Plenary Assembly by Party and Region on the voting of Law n° 62/1989

	CO	NE	NO	SE	SU	TOTAL(%)
PMDB	3	10	6	8	11	37.6%
PFL	2	15	2	5	2	25.7%
PSDB	2	2	2	5	1	11.9%
PTB	5	0	1	1	1	7.9%
PDS	0	1	2	0	2	5.0%
PDT	0	2	0	1	2	5.0%
PCB	1	1	0	0	0	2.0%
PL	0	0	0	2	0	2.0%
PDC	0	1	0	0	0	1.0%
PLP	1	0	0	0	0	1.0%
PT	0	0	0	1	0	1.0%
TOTAL(%)	13.9%	31.7%	12.9%	22.8%	18.8%	100%

Source: DCD, 1989 - Minutes from the 165th session on 28/11/1989. Prepared by the author.

to approve the criteria for revenue sharing in 1988, which they would have benefitted from, due to resistance from other regions. However, this resistance that was enough to block the decision at the time of Constitutional Convention, completely disappeared in 1989. It was not clear why it happened especially since the North, Northeast, and Center-West regions did not have anything else to offer in exchange for support, as had been the case at the Constitutional Convention of 1988.

Furthermore, changes did not occur in the territorial structure of inequality between 1988 and 1989. Moreover, the representatives in 1989 were the same as in the Constitutional Convention one year earlier in 1988.

The majority rule played an important role here. If unanimous consent were necessary for either the states or the regions to approve the Bill n° 62/89, a single state would be able to veto it. Thus, the status quo would be the result according to Be-

ramendi's model because the South and Southeast states would oppose any change that did not benefit them. Due to the majority rule, the South and Southeast would not be able to do anything if the other regions decided to approve the bill. As graph 1 shows, regions interested in higher redistribution totaled more than 60% of the seats. Again, although they were a minority, these states would be expected to resist a rule that opposes its median voter preferences.

In fact, the lack of resistance from South and Southeast in 1989 when the sharing rule was approved cannot be understood without looking at the overall impact that changes to the fiscal structure posed to local government finances. Hence, in addition to the criteria for revenue sharing, we must also consider the changes to the states' finances, which were largely introduced by the 1988 Constitution.

As previously mentioned, the criteria for revenue sharing among states and regions from Bill nº 104 of 1989, adopted as Supplementary Law nº 62 of 1989, distributed 85% of the overall amount of the FPE fund, as defined in the Constitution, exclusively to states in the North, Northeast, and Center-West regions, and no longer the exclusive 20% added to the general revenue sharing of the other 80%, according to previous legislation. However, it is necessary to consider that the new Constitution changed the overall percentage of IR and IPI distributed to the FPE fund from 14% to 21.5%. When taken as a whole, these changes draw a different picture of who the winners and losers were as a result of the new criteria for sharing the FPE fund. To identify the winners and losers of this new law, it is first necessary to calculate the total percentages of IPI and IR that were distributed to each state before and after the change, with these criteria taken into consideration.

Table 4 compares each state and region percentage share of IPI and IR collected by

the Union and distributed to the states through transfers of the FPE fund, before and after the changes introduced in the Constitution and in the Law nº 62 of 1989 (details of this calculation are in the Appendix A.2). The coefficients listed in table 4 are the official values and are contained in the Brazilian Court of Audit (TCU) resolutions. These resolutions⁸ presents the actual coefficients after calculation according to the rules of the laws for individual states for the budgetary operations each year. The total and individual amounts for each state and region in the Table 4 represent the percentage totals of IPI and IR transferred. For example, under Law nº 62 of 1989, the South (SO) and Southeast (SE) received 15% of the FPE fund, or in other words, 15% of the 21.5% of IPI and IR distributed to the FPE fund. These regions would thus receive a total of 3.225% of IPI and IR collected ($15\% \times 21.5\% = 3.225\%$).

As can be seen in the Table 4, all the states, with the exception of São Paulo and Rio de Janeiro, began to have a higher share of the Union revenue from IPI and IR in comparison to the shares they had received under the previous rule. The Southeast region, as a whole, began to receive less due to the reduction in transfers to these two states. If we consider the previous average percentage share (column A of the Table 4), the values highlighted in the table show that São Paulo had its percentage share of IPI and IR reduced by approximately 0.18% under the new law. Rio de Janeiro's percentage share became approximately 0.13% less. All of the other states benefitted from the changes.

⁸The following years have been considered: 1981, 1984, 1985, 1987, 1989 and 1990. The other years have not been included because the coefficients are not considered in the Brazilian Court of Audit (TCU) resolutions available for reference. The TCU calculated coefficients for 1990 based on the previous rule, even though they had not been used due to the approval of the Law 62/89 (see Brasil - TCU, Resoluções 240/89, 242 and 244/90). This allows us to precisely compare the impact of the new rule on the states budget.

If we consider that the actors took into account the impact the changes would have on their revenues when they performed their strategic choices, we can conclude that the South region, as well as two states from the Southeast region (Minas Gerais and Espírito Santo) would have no reason to oppose the criteria defined in the new law.

Thus, the only thing left is to explain why São Paulo and Rio de Janeiro did not organize themselves to try to veto the bill. Again, the answer may lie in the overall amount of transfers these states received after the reforms at the Constitutional Convention, as well as the share of revenue that these transfers represented to these states.

Firstly, in addition to the increase in transfers of IPI and IR through the FPE fund to the states, the Constitutional Convention created the Reimbursement Fund (FR) for exporting states. This fund was an innovation of the Constitutional Convention and came from the initiative of the South states, especially Rio Grande do Sul (Leme, 1992, p.161), and its purpose was to compensate exporting states for the revenue losses caused by tax exemptions placed on exports (Id.). Of all the states, those from the South and Southeast regions benefitted the most. At the end of the Constitutional Convention process, it was approved that 10% of IPI collected by the Union would be transferred to these states, in proportion to the value of their exports (Brazilian Constitution, article 159-II). In 1990, the states that benefitted the most from this fund were in the following order: São Paulo, Minas Gerais, Rio Grande do Sul, Rio de Janeiro, Bahia, Espírito Santo, Santa Catarina, and Paraná. This list, with the exception of Bahia, is comprised of all of the states from the South and Southeast regions.

Let us take a look at São Paulo and Rio de Janeiro, the apparent losers from the

new law (Law nº 62 of 1989). Under the old rule, states from the South and Southeast would receive:

$$FPE_{UF} = 0.14 \times 0.8(IPI + IR) \times coef_{UF}$$

If we consider the coefficients for São Paulo, the old rule would provide an average annual transfer⁹ total from the FPE fund (details of the calculations are in the Appendix A.2):

$$FPE_{SP} = 0.0039836(IPI + IR) \quad (2)$$

The 1988 Constitution ruled that 21.5% of the total IPI and IR collected by the federal government should go to the FPE fund. Together with the new coefficients from Law nº 61 of 1989, São Paulo began to receive a total share equal to:

$$FPE_{SP} = 0.00215(IPI + IR) \quad (3)$$

If we stopped here, we would conclude that São Paulo began to receive 0.18% less than before, as shown in Table 4. However, in addition to that, states began to receive 10% of IPI in proportion to their respective exports from the Reimbursement Fund (FR). The coefficient for São Paulo in 1990, calculated by the TCU, determined that 20% of the total 10% transferred from the FR would go to São Paulo. As a result:

$$FR_{SP} = 0.02(IPI) \quad (4)$$

⁹The following years have been considered: 1981, 1984, 1985, 1987, 1989 and 1990, for which official figures were available. Data is available at: http://portal2.tcu.gov.br/portal/page/portal/TCU/comunidades/transferencias/fpe_fpm

Thus, by calculating (2), (3) and (4), the variation in the percentage of transferred revenue from IPI and IR corresponds to:

$$\Delta \text{Transf}_{SP} = 0.01826(IPI) + (-0.00183)(IR) \quad (5)$$

Equation (5) reveals that in 1990 São Paulo increased its share of IPI by 1.82%, but reduced its share of IR by 0.18% compared with its average for previous years. Under the hypothesis of constant total revenue of IPI and IR between two years, in order for this variation to represent a loss of revenue, the collection of IR should be 10 times as high as IPI. For an idea, between 1980 and 1990, the collection of IPI represented an average of 58.21% of what was collected in IR. In 2000, this percentage reached 36.5%, that is, the IR was approximately 2.8 times as high. That was the lowest percentage of IPI since 1980.

If we make the same calculations for Rio de Janeiro, it is possible to identify that in 1990 Rio de Janeiro increased its share of IPI by approximately 0.75%. However it reduced its share of IR by 0.13% relative to its average for previous years. In order for this variation to represent a loss in revenue, the collection of IR must be six times as great as that of IPI.

In summary, São Paulo and Rio de Janeiro also began to have higher shares of Union revenue through constitutional funds. Although they were losers in terms of their share of transferred IR relative to what they had previously received, this loss was easily compensated by their gain in transferred IPI. In addition to not losing revenue from these transfers, these states, as pointed out before, were able to increase their control over the ICMS tax rate. For these particular states, constitutional transfers

represent a much lower share of the revenue composition than for the other states. In contrast, individual collections, especially due to the ICMS tax, represent a substantial share of their collected revenue.

Thus, although fiscal reforms from the Constitutional Convention and the new criteria for revenue sharing brought higher shares to states from the Northeast, North, and Center-West regions (in that order), they also increased revenue for states in other regions. Not one state had its revenue affected by the changes. However, during the Constitutional Convention, this was not clear. What changed between the Constitutional Convention and the following year, when the criteria for revenue sharing were adopted, was the fact that the states could accurately determine how the changes would impact their revenues. This calculation is what favored the consensus.

The criteria for sharing the FPE fund from Law nº 104 of 1989 were not decided on during the bill approval process, but rather beforehand. Bill nº 104 of 1989, which established the supplementary law with the criteria for sharing the FPE fund, came as a result of a proposal that had been introduced by the Secretaries of the Treasury and the Secretaries of Finances of the States and the Federal District (DCD, 31/10/89, page 12715, Col.01). According to the justification made by Firmo de Castro (PMDB/CE), the Secretaries' argument over the criteria for revenue sharing was for the reduction of inter-regional inequality of public income. The result of the meetings between the state secretaries, which were held from October 1988 to February 1989, in which "all the participants, from the most developed states to the least developed states", agreed that "the states from the North, Northeast, and Center-West regions should increase their total share of the FPE fund from 78% to 85%" (id., free translation). This measure would compensate these states, since "the increase of the reserve base of

ICMS [obtained by constitutional tax reforms would benefit] [...] the most developed states in the country more significantly" (ibid., free translation). In addition to the approval of the increase of 85% of the FPE fund to be distributed exclusively to the least developed regions, Firmo de Castro (PMDB/CE) points out that there was unanimous approval among the states Secretaries of the Treasury and the Secretaries of Finance to fix the coefficients for individual states. The coefficients for individual states from this law were obtained through adjustments to the coefficients that had previously been in force. The coefficients for individual states also aimed to offset the budgets of the poorest regions.

Finally, another element that supported the agreement was the decision that the law would be provisional. The coefficients, as the law and the agreement predicted, would be reviewed after the population census scheduled for 1990, which would provide the population and economic data to calculate the new coefficients. In addition to that, after a few years of the new fiscal structure in place, data on public finances would also be available under this new arrangement. The coefficients determined in the supplementary law would therefore only be valid up to, and including, the budgetary execution of 1991.

Nonetheless, Law nº 62/89 regulated the transfers of the FPE fund until at least 2012. In one of its paragraphs (article 2º, § 3) the law approved contained a provision that would allow it to be valid even after 1992.

Article 2 [...]

§ 1º The percentage of the Fund for States (FPE) to be sent to the individual States and the Federal District, to be applied up to and including the year of 1992, are shown in the Annex, which is part of this Supplementary

Law.

§ 2 The criteria for sharing the States and Federal District Participation Fund, to be in force from 1992, will be established in a specific law, based on the calculation of the 1990 census.

§ 3 Until the criteria, which refer to the previous paragraph have been defined, the coefficients established in this Supplementary Law will continue to be in force.

After 1992, and despite attempts from representatives from several states, not one piece of the legislation replaced Law n^o 62 of 1989.

Finally, in 2010, the Supreme Court (STF) ruled the fixed criteria defined in Law n^o 62 of 1989 unconstitutional. What motivated this Supreme Court decision were four Direct Actions of Unconstitutionality (ADIs) proposed by state governors from the South and Center-West regions. The argument was precisely that the fixed criteria for revenue sharing did not permit the socioeconomic changes that states faced to be incorporated into the transfers, such that the FPE fund was not properly fulfilling its role of interregional redistribution, as determined in the Constitution of 1988.

Table 4: % of IPI and IR transferred to the states

UF	Região	(A)	(B)	(C)	(C) - (A)	(C) - (B)
DF	CO	0.08072	0.08551	0.14839	0.06767	0.06288
GO	CO	0.4655	0.35224	0.61127	0.14577	0.25903
MS	CO	0.19029	0.16503	0.28638	0.09609	0.12135
MT	CO	0.29616	0.28594	0.4962	0.20004	0.21026
TOTAL CO		1.03267	0.88872	1.54224	0.50957	0.65352
AL	NE	0.51415	0.52535	0.89442	0.38027	0.36907
BA	NE	1.36803	1.31548	2.02018	0.65215	0.7047
CE	NE	0.98496	0.9784	1.57743	0.59248	0.59903
MA	NE	0.91757	0.94445	1.55191	0.63435	0.60746
PB	NE	0.63692	0.60476	1.02961	0.39269	0.42486
PE	NE	0.9511	0.88628	1.48354	0.53244	0.59726
RN	NE	0.51646	0.52759	0.89825	0.38179	0.37066
SE	NE	0.51356	0.52472	0.89339	0.37983	0.36867
TOTAL NE		6.40275	6.30704	10.34875	3.94599	4.0417
AC	NO	0.44126	0.432	0.73552	0.29426	0.30352
AM	NO	0.3925	0.35237	0.59994	0.20743	0.24757
AP	NO	0.43093	0.43093	0.73358	0.30265	0.30265
PA	NO	0.78688	0.77189	1.31408	0.5272	0.54219
PI	NO	0.5348	0.54572	0.9291	0.3943	0.38338
RO	NO	0.36361	0.35542	0.60535	0.24175	0.24994
RR	NO	0.31983	0.31326	0.53335	0.21352	0.22009
TO	NO	0.54813	0.54813	0.9331	0.38497	0.38497
TOTAL NO		3.81795	3.74972	6.38402	2.56607	2.6343
ES	SE	0.19774	0.17326	0.3225	0.12476	0.14924
MG	SE	0.94458	0.8909	0.95772	0.01314	0.06681
RJ	SE	0.46197	0.47527	0.32846	-0.13352	-0.14682
SP	SE	0.39836	0.44195	0.215	-0.18336	-0.22695
TOTAL SE		2.00264	1.98139	1.82367	-0.17897	-0.15772
PR	SU	0.4632	0.47488	0.61989	0.15668	0.14501
RS	SU	0.39175	0.38769	0.50628	0.11453	0.11859
SC	SU	0.2186	0.21056	0.27516	0.05656	0.0646
TOTAL SU		1.07355	1.07313	1.40133	0.32778	0.3282
TOTAL (NO + NE + CO)		11.25337	10.94548	18.275	7.02163	7.32952
TOTAL (SU + SE)		3.0761	3.05452	3.225	0.14881	0.17048
TOTAL		14.32956	14	21.5	7.17044	7.5

Source: TCU, 1988 Constitution and Law nº 62/89.

(A) average % between 1981 and 1990

(B) % if the status-quo was preserved

(C) % after the changes introduced but the 1988 Constitution and Law nº62/89

5. Conclusion

A regional low-income coalition took place when the fiscal chapter of the 1988 Constitution was in the process of being developed as well as when the Congress voted on law 62/89. This coalition reflects what Beramendi's model predicted quite well. However, the reasons behind the regional actors' behavior include additional motivations not predicted by the model.

The bargains that occurred during those situations revolved around budgetary concerns. The behavior of the wealthiest states only seems plausible when we consider that they were worried about the impact the new transfers system would have on their budgets. According to Beramendi's model, their median voter did not support centralization. As the wealthiest states were the minority in the House of Representatives and as the rule demanded an absolute majority to approve the changes, they would have lost anyway. Hence, the wealthiest states had incentives to show their voters that they at least tried to veto those changes. The lack of any resistance to the approval indicates that some agreement took place. I have argued that it happened because the changes would not negatively affect their budgets. The new fiscal system brought uncertainty about the subnational governments revenue. The representatives were able to reduce this uncertainty. They did that because they could calculate the impact of the new system in their budget. They knew the overall change introduced by the Constitution and they were anchored in the information provided by their Secretary of Finances. Only part of this information was present in 1988.

When we look at the debates that took place in the Constitutional Convention Committees and Subcommittees, it becomes even more clear that the representatives

where worried about the budget of the subnational governments when fiscal design was being discussed.

In the end, the decisions that involved the FPE fund, contributed to an increase in the interregional redistributive power of the constitutional transfers to the states. Inter-regional transfers are only possible through centralization. With that said, maintaining centralization was a necessary choice for the poorest states.

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A. Apêndices

A.1. Variables

The socioeconomic data of the population was obtained from the Brazilian National Household surveys (PNAD) of 1987. The PNAD of 1987 (and remained this way until 2002) did not collect data from the rural region in the North of Brazil, except for Tocantins.

Proportion of the Population Employed (β)

$$\beta = \frac{\text{Eemployed Population}}{\text{Total Population}}$$

For 1987, the variable used was "5100 - Hours worked at all jobs". This variable indicates the number of hours worked per week by a person at his main job and at any other jobs he has [IBGE \(1988\)](#). The people who responded to this question were considered to be employed.

Median voter income (w_m)

For 1987, the PNAD variable used was "601 - Monthly income from all jobs". Income was deflated by the IPCA to Brazilian reais (R\$) in 2000. ***Indicator of economic***

specialization (σ)

There are several indicators of economic specialization. One of the most widely used

is the Herfindahl index ([Research and Economic Analyses Division - State of Hawaii, 2008](#); [Scherer, 1980](#); [Tauer, 1992](#)). This index is used to measure the concentration of the industrial activity, but it can also be used to measure the concentration of the employment in a specific area for economic activity in general.

$$\text{Herfindahl index} = \sum_i S_i^2$$

where S_i represents the portion of the population that is employed in sector i . The index varies from zero to one. The more concentrated the employed population is in a specific sector, the less diversified the economy is and the closer the index is to 1. In other words, 1 indicates total economic specialization, where the entire population is employed in one single industry of the economy.

As in the argument developed by the model assumes that the risk of job loss is directly associated to the degree of economic specialization, I have adopted it as a proxy for this risk. That is:

$$\sigma^2 = k \sum_i S_i^2$$

For 1987, the variable used was "504 - Activity / Area of work". This is a categorical variable that indicates the area of economic activity performed by the person interviewed.

Table 5: Summary of the variables

Variable	Data
β	Definition: Proportion of employed population Source: PNAD 1987 (var:5100) $\beta = \frac{\text{População empregada}}{\text{População Total}}$
λ	Definition: Proportion of unemployed population Source: PNAD 1987 (var:5100) : $\lambda = 1 - \beta$
w_m	Definition: Median voter income Source: PNAD 1987 (var: 601)
y	Definition: GDP <i>per capita</i> of states and union Source: Instituto de Pesquisa Economica Aplciada (IPEA)
σ^2	Definition: Economic diversification index (proxy) Source: PNAD 1987 (var: 504) : $\sigma^2 = \sum_i S_i^2$ (Herfindahl index) where S_i is the share of populacion of the state employed in the sector i .

A.2. Allocation and The Criteria for Sharing the FPE fund from 1966 to 2012

From its creation until 2012, the final value of the State Participation Fund (FPE) was given by a percentage of net IPI and net IR, that is, after the discounts of refunds and tax incentives. So, the total allocated to the FPE fund is given by:

$$R_{Gross} = IPI + IR$$

$$R_{net} = R_{Gross} - \text{Refunds} - \text{Tax Incentives}$$

$$FPE_{Total} = p_{FPE} * R_{net}$$

Table 6 presents the variation for defining total percentages (p_{FPE}) of IPI and IR allocated to the FPE fund over time.

Table 6: Percentage of IPI and IR allocated to FPE from 1966 to 2012

Law	Period	Perc.IR and IPI to FPE (p_{FPE})
EC nº 18 de 1965	1967-1968	10%
AC nº 40 de 1968	1969-1975	5%
EC nº 5 de 1975	1976	6%
	1977	7%
	1978	8%
	1979-1980	9%
EC nº 17 de 1980	1981	10%
	1982-1983	10.5%
EC nº 23 de 1983	1984	12.5%
	1985	14%
EC nº 27 de 1985	1985-1988	14%
LC nº 62 de 1989	1988	18%
	1989	19%
	1990	19.5%
	1991	20%
	1992	20.5%
	1993-2012	21.5%

Source: Referred law and www.camara.gov.br. Prepared by the author.

The criteria for sharing the FPE fund among states from 1966 to 1975

The criteria for sharing the FPE fund contained in articles 88, 89 and 90 of the National Tax Code of 1966 (Law nº 5172 of 1966), until the Decree-law nº 1.434 of

1975 was obtained through the following formula:

$$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{pop_{UF}} * f_{income_{UF}}}{\sum f_{pop_{UF}} * f_{income_{UF}}} \right) * FPE_{Total} \quad (6)$$

where A_{UF} is the territorial area relative to the state, f_{pop} and f_{income} are respectively the representative factors for state population and for the inverse of per capita state income. These two factors were defined by the tax code of 1966 as shown in the following two tables.

The criteria for sharing the FPE fund among states from 1976 to 1988

After 1975, 20% of total FPE fund was divided exclusively among states from the North and Northeast regions. These regions remained with:

$$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{pop_{UF}} * f_{income_{UF}}}{\sum f_{pop_{UF}} * f_{income_{UF}}} \right) * 0,2 * FPE_{Total} \quad (7)$$

All states, including those from the North and Northeast regions, received:

$$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{pop_{UF}} * f_{income_{UF}}}{\sum f_{pop_{UF}} * f_{income_{UF}}} \right) * 0,8 * FPE_{Total} \quad (8)$$

Tables 7 and 8 present representative factors of the population (f_{pop}) and income (f_{income}) as defined under the National Tax Code (NTC) (Law n° 5172, article 89). In the case of the representative factor for income, it was calculated with assistance from the related per capita income from the UF given by:

$$\text{Relative Index} = \frac{\text{per capita income}_{UF}}{\sum_{UF} \text{per capita income}_{UF}}$$

Table 7: Representative factor for the population

Proportion of the population in the state	f_{pop}
I - Up to 2%	2
II - From 2% to 5%:	—
a) for the first 2%	2
b) for every 0.3% or exceeding fraction, add	0.3
III - up to 5% to 10%:	—
a) for the first 5%	5
b) for every 0.5% of exceeding fraction, add	0.5
IV - up to 10%	10

Source: Lei 5172/66, art.89.

Table 8: Representative factor for income

Inverse of the index relative to per capita income	f_{income}
to 0,0045	0.40
From 0,0045 to 0,0055	0.50
From 0,0055 to 0,0065	0.60
From 0,0065 to 0,0075	0.70
From 0,0075 to 0,0085	0.80
From 0,0085 to 0,0095	0.90
From 0,0095 to 0,0110	1.00
From 0,0110 to 0,0130	1.20
From 0,0130 to 0,0150	1.40
From 0,0150 to 0,0170	1.60
From 0,0170 to 0,0190	1.80
From 0,0190 to 0,0220	2.00
Above 0,220	2.50

Source: Lei 5172/66, art.89.

The Criteria for Sharing the FPE fund from 1988 to 2012

The criteria for revenue sharing that were in force until 2012, fixed and defined in the Single Annex of Supplementary Law n° 62 of 1989, are as follows:

States from the North, Northeast and Central-West:

$$FPE_{UF} = p_{UF}(0, 85) * FPE_{Total} \quad (9)$$

States from the South and Southeast:

$$FPE_{UF} = p_{UF}(0, 15) * FPE_{Total} \quad (10)$$

The reserving of 85% and 15% of the fund for the regions is fixed in the coefficients for individual states, fixed in the annex of Law n° 62 of 1989 as indicated in table 9:

Table 9: Each state's percentage share of the FPE fund from 1989 to 2012 (Law nº 62 of 1989)

State	Region	Share (p_{UF})
Acre	NO	3.421
Amapá	NO	3.412
Amazonas	NO	2.7904
Pará	NO	6.112
Rondônia	NO	2.8156
Roraima	NO	2.4807
Tocantins	NO	4.34
Alagoas	NE	4.1601
Bahia	NE	9.3962
Ceará	NE	7.3369
Maranhão	NE	7.2182
Paraíba	NE	4.7889
Pernambuco	NE	6.9002
Piauí	NE	4.3214
Rio Grande do	NE	4.1779
Sergipe	NE	4.1553
Distrito Federal	CO	0.6902
Goiás	CO	2.8431
Mato Grosso	CO	2.3079
Mato Grosso do	CO	1.332
Espírito Santo	SE	1.5
Minas Gerais	SE	4.4545
Rio de Janeiro	SE	1.5277
São Paulo	SE	1
Paraná	SL	2.8832
Rio Grande do	SL	2.3548
Santa Catarina	SL	1.2798
TOTAL	SE+SL	15 %
TOTAL	NO+NR+CO	85 %
TOTAL GERAL		100 %

Source: Cited legislation.

Table 10: Summary of the criteria for revenue sharing by overall percentages and the FPE fund among states and regions that were used in Brazil from 1966 to 2012

Period	Region	State sharing rule
1966-1975 ^[a]	Todas	$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{popUF} * f_{incomeUF}}{\sum f_{popUF} * f_{incomeUF}} \right) * FPE_{Total}$
1976-1989 ^{[b][1]}	NO e NE	$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{popUF} * f_{incomeUF}}{\sum f_{popUF} * f_{incomeUF}} \right) * 0,2 * FPE_{Total}$
1990-2012 ^[c]	Todas	$FPE_{UF} = \left(0,05 * A_{UF} + 0,95 * \frac{f_{popUF} * f_{incomeUF}}{\sum f_{popUF} * f_{incomeUF}} \right) * 0,8 * FPE_{Total}$
	NO, NE, CO	$FPE_{UF} = p_{UF}(0,85) * FPE_{Total}$
	SL, SE	$FPE_{UF} = p_{UF}(0,15) * FPE_{Total}$

^[1]In 1976 and 1977 North and Northwest received 10%.

^[a]Decree-law n° 5172/66.

^[b]Decree-law n° 1.434 de 1975 e n° 1.723 de 1979.

^[c]Supplementary law n° 62 de 1989.