The Impact of Decentralization Revenue on Economic Growth and Wellbeing

Resumo: O artigo tem dois objetivos: primeiro, testar o impacto da política de transferência da receita (medido pelo FPM) do governo central para os municípios brasileiros sobre o desempenho dos mesmos no âmbito do crescimento do PIB per capita, saúde e educação. Segundo, testar o impacto das auditorias feitas pelo CGU nestes municípios brasileiros visando a redução da corrupção sobre as mesmas variáveis acima descritas (taxa de crescimento do PIB per capita, saúde e educação). Para lidar com o problema da endogeneidade utiliza-se a descontinuidades do FPM teórico num modelo *Fuzzy Discontinue Designer*. Os resultados sugerem que a descentralização dos recursos induz crescimento do PIB per capita, porém reduzem o desempenho na educação e saúde. Além disto, a interação entre transferências e auditoria da CGU sugere que os municípios auditados têm um maior crescimento do PIB per capita e um melhor desempenho em educação e saúde.
Palavras-Chave: Descentralização, Regressão Descontínua, Municípios, Desenvolvimento humano.

Abstract: First of all, we are testing the net impact of revenue decentralization from central government to Brazilian municipalities on gdp *per capita* growth, health and education indexes. Second, we are testing the impact of accountability (CGU auditing) to promote a positive effect of decentralization on our outputs through corruption reduction. To deal with endogeneity problem we are using the FPM population discontinuities and applying the fuzzy Discontinue Designer (DD) setup to study the effects of a discrete change in transfers between municipalities just above or below the thresholds. The results suggested that higher decentralization resources induce more GDP per capita growth, and reduce education and health performance. Moreover, the interaction between decentralization revenue and audited reports (CGU), suggested that municipalities audited by CGU, increase GDP per capita growth, and their education and health performance is improved.
Keywords: Decentralization Policy, Discontinue Designer, Municipalities, Human Development
Código JEL: I150, R110, C930

Introdução:

Decentralization is theoretically considered more efficient to fit programs to local preferences and mayors would better able to evaluate and respond to population demand (Rodríguez-Pose and Sandall (2008) and Rodríguez-Pose and Serrano (2013)). By reducing the asymmetry of information, people could choose locations with better performance, generating beneficial competition between municipalities. Thus, local politicians would have incentives to meet the demand and maintain their "constituency". However, decentralization can also result in the loss of economies of scale. If the latter has a higher magnitude than the former, the result could be an increased expense. Furthermore, when decentralization is associated with tax differentiation between regions, the result may be greater inequity. Thus, the successes of decentralization depends on the existence of effective channels for the population to express their preferences (Costa-Font, Moscone, 2008 Crivelli; Leive; Stratmann, 2010).

Donahue 1997 defines devolution as a process to transfer political power and resources from central government to subnational levels of government. Devolution is a broader concept than decentralization because it corresponds to the return to municipalities not only of the revenue collected from its residents, but also the ability of these to collect taxes and to take responsibility for the expenses that occur in the municipalities. It is a form of administrative decentralization. This process was spread by European Countries at the beginning of the 21st century (POSE 2003, 2005). Theoretically, there are many advantages for local governments (Klugman, 1994) (Rodríguez-Pose & Ezcurra, 2011). However, empirically, there is no evidence that fiscal decentralization benefits sub territorial economies (Rodríguez-Pose & Ezcurra, 2011; Inman and Rubinfeld, 2000; Storper, 2005; Prud'Homme, 1995); Oates, 1993; Odero, 2004; Rodríguez-Pose, 2013).

Indeed, economic growth and development does not depend exclusively on the degree of fiscal devolution of a country (Davoodi and Zou, 1998; Akai and Sakata, 2002; Iimi, 2005; Thornton, 2007) and omitted variables may ultimately lie behind the observed negative relationship. In addition, the transfer of power and resources from central to subnational governments is a multidimensional process (Ebel and Yilmaz, 2002; Stegarescu, 2005) and a potential influence on the degree of fiscal devolution.

The aim of this paper is to measure the impact of the devolution process on municipalities' economic growth and wellbeing measures by health and education indexs. However, the simultaneity of decentralization and our outcomes makes it difficult to determine causality. To deal with this problem we are working with a Brazilian dataset because their governmental revenue transfer to municipalities changes exogenously and discontinuously at given population thresholds. Actually, each municipality in the same state has the same population bracket and receives, theoretically, the same governmental revenue transfers. Indeed, our decentralization measure does not follow exactly this role, but they are a strong function of an exogenous government revenue transfer that follow it. Specifically, we are using these population discontinuities and the theoretical transfer as an instrument for decentralization and applying the fuzzy Discontinue Designer (DD) setup to study the effects of a discrete change in transfers between municipalities just above or below the thresholds.

In addition, it is possible to argue that in municipalities where the institutions are fragile, there is a higher corruption index and the population does not have power to apply the pressure on local politics necessary for the success of the decentralization strategy. As argued by Rodríguez-Pose and Garcilazo 2015, the weaker the institutional setting, the more difficult it is to transform investments into growth and development. To test this prediction, we compare the impact of the municipalities anticorruption program promoted by Brazilian Governmental Accountability Office (CGU)[1] on our outputs above and below the population thresholds. It is a similar identification strategy to that used by Ferraz and Finan 2008 to identify the electoral punishment of disclosed corruption and also used by Brollo et. al., 2013 to discover that municipalities which receives a larger budget, faces a weaker electoral punishment for corruption.

[1] The CGU (*Controladoria Geral da União*) is similar to US Government Accountability Office (GAO). Their task is carried out by way of public audits, fraud deterrence procedures, and other sort of internal control, corruption prevention, and ombudsman activities. It is also the central body of the Federal Government Internal Control System, responsible for supervising, managing, and regulating the offices of the government.

Therefore, we are testing two assumptions: first, we are interested in testing the net impact of decentralization on gdp *per capita* growth, health and education indexes. Second, we test the impact of CGU auditing to promote a positive effect of decentralization on our outputs through corruption reduction.

Finally, this paper is structured along the following lines. The next section presents our decentralization definition and the Brazilian CGU anti corruption program. Section 3 introduces the dataset and empirical setup, while Section 4 presents the empirical results and discussion. The conclusions and some policy implications are included in Section 5.

The Brazilian Decentralization Structure and Their Governmental Accountability

Intergovernmental fiscal transfers represent an important balancing mechanism of the subnational units (SU) finance, both in developing and developed countries. There are at least two economic reasons to make such transfers: vertical and horizontal fiscal gaps. The vertical fiscal gap comes from the mismatch between the ability of the central government to raise taxes *vs* the ability of the SU to provide public services. The horizontal fiscal gap happens when the provision of public services does not have the same standard of quality in all SUs.
From an economic point of view, revenues should be collected by the central government while the expenditure should be made by local governments. This process makes obvious the need to establish central level resource transfers to the local levels. (Tiebout, 1956; Oates, 1972).
Furthermore, despite the theoretical economic efficiency of decentralization, it is not clear if fiscal transfer is able to reduce horizontal gaps between SUs. Working with the Brazilian dataset we are interested in testing if decentralization strategy is able reduce horizontal gaps between Brazilian municipalities.
This subsection describes the Brazilian decentralization setup and their accountability control. In the next subsection we discuss our identification strategy to calculate the decentralization impact on growth and health and education of the municipalities.

The Brazilian Decentralization Setup

In most countries, SU financial resources can have different sources. In Brazil, they can be either collected locally and remain there to be spent by the municipal administration (tax revenue) or be collected at another level of government that transfers the resource to localities later on (transfer revenue). These transfers also differ as they are either conditional, that is directed to specific programs and areas and local governments have no autonomy over them, or non-conditional, whereby local governments have full autonomy. With this type of system, when we are analyzing decentralization at city level, it is also important to understand the underlying mechanisms in the decentralization process in order to expose its effects. Indeed, the governmental transfer could be divided in two types: the conditional are Maintenance Fund to Finance Public education (FUNDEB[2]) and The Health Care Transference (PAB[3)], while the unconditional transfers are the Municipalities' Participation Fund (FPM[4]).

The FUNDEB aims to equalize the available resources in education across municipalities. This mechanism comprised 15% of the States' Participation Fund (FPE), the

[2] *Fundo de Manutenção e Desenvolvimento do Ensino e de Valorização do Magistério*
[3] *Piso da Atenção Básica*
[4] *Fundo de Participação dos Municípios*

FPM, sales tax on goods and services (ICMS, including appeals related to the exemption of exports mentioned in Supplementary Law 87/1996), and excise tax on industrialized products related to exports. The PAB is a financing mechanism for the Brazilian Health System (Sistema Unico de Saude – SUS). The amount is transferred monthly to each municipality according to a formula that linearly links the amount of resources (fixed PAB) to the number of inhabitants of the municipality in that year, according to IBGE. Resources must be expended only on basic health and in accordance with the guidelines of the Municipal Health Plan.

Finally, FPM is the most important transfer to Brazilian Municipalities and the only one over which local governments have spending autonomy. These amounts must be allocated to each municipality, as is clearly established by constitutional rules. It is mandatory, unconditional, nonmatching. In summary, the FPM transfers are transparent and free of political pressure. The 10% of funds transferred to capitals is distributed according to coefficients based on the ratio between the population of the capital, the sum of the population of all capitals, and the inverse of the per capita income of the state where the municipality is located. The official number of inhabitants in any particular municipality is measured every ten years by the Brazilian Geographic Institute (*Instituto Brasileiro de Geografia e Estatistica*-IBGE). It provides annual estimates of local populations between census years. The central government then uses these estimates to distribute FPM funds to municipalities. In this paper, we will use the FPM as an unconditional governmental transfer revenue measure.

In most countries responsibilities for city level expenditure are shared by different levels of government, such as federal, state and municipality. Therefore, to analyze decentralization of fiscal power in a municipality, it is important to understand the rate of financial resources spent by the municipality and the total expenditure made by the state and federal entities. To illustrate this shared responsibility at city level, the case of the Brazilian Education System is emblematic: while primary education is the responsibility of the municipal government, secondary and tertiary education are the responsibility of the state and federal government, respectively. The same rule is applied to the Brazilian Health System. Primary health care is the responsibility of the municipal government, while secondary and tertiary care (high complexity) are the state and federal responsibilities, respectively. The evaluation of the governmental transfer revenue can demonstrate the level of dependency of the municipalities on the state and federal entities. However, if the central government spends most of their revenue in a few municipalities, they could grow not because of efficiency in their expenditure, but because of high investment from the central government.

Unfortunately we do not have information about the total expenditure by central government in each municipality. We have therefore estimated this amount based on available data from the National Treasury of Brazil. The National Treasury allows us to access the exact amount of financial resources that is available to each city and, as cities do not save from one year to the next, this can be considered the amount of financial resources spent by a city on its own administrative region. However, there is no data at city level to show how much is spent by other tiers of government in a specific city. In order to overcome this lack of data, we rely on an estimate for other levels of government, based on the value added by the government on the GDP of each city in the analyzed period. The estimate was constructed by first calculating the percentage of value added by the government of each city in relation to the total value added by the government of all cities. For example, in the year 2008, Campinas had a value added by the government of R$ 2,188,079.00 to its GDP while the overall valued added by the government in Brazilian cities was R$ 252,421,440.00. This means that in relation to all the value added by the government in Brazil, Campinas had in its own territory 0.8% of all value

added by the government. After adding this value by the government of each city, we took the overall government expenditure of the three tiers of government (municipal, state and federal) that is released by the National Treasury and multiplied it by the valued added in each city. With this calculation, we produced an estimate of how much all tiers of government together spend in each city. We named this variable ExpAll.

The ability of the government to raise revenues from its own sources used to be dependent on the economic structures of state and municipality and on the availability of taxable resources. In other words, fiscal capacity is high correlated with institution quality. On the other hand, in the case of Brazil, the unconditional governmental revenue transfers to municipalities are exogenous and depend on population.

Therefore, we define devolution as a rate between unconditional governmental transfer revenue (FPM_{it}) plus conditional transfer (PAB_{it}+$FUNDEB_{it}$) plus tax revenue (tax_{it}) divided by total government expenditure ($ExpAll_{it}$) for the city i in the year t

The proxy decentralization is

$$Devolution_{it} = \frac{\mathrm{FPM}_{it} + \mathrm{PABit} + \mathrm{FUNDEBit} + tax_{it}}{ExpAll_{it}}$$

The Brazilian Governmental Accountability

The 1988 the Brazilian Constitution changed the Brazilian institutional framework exogenously. Among other changes, the Controladoria Geral da União (CGU) (similar to the US Government Accountability Office (GAO)) was created. The work of this office is carried out by way of public audits, fraud deterrence procedures, and other means of internal control, corruption prevention, and ombudsman activities. It is also the central body of the Federal Government Internal Control System, responsible for supervising, managing, and regulating the offices of the government.

In 2003 CGU began a municipalities' accountability program based on random selection of cities to be audited on their use of federal government transfers. The cities are selected by a random mechanism where only cities with fewer than 500,000 inhabitants are to be chosen for an audit. The program audits a limited number of cities as there are limited financial resources and personnel to engage in this auditing initiative.

It is central to understand the underlying mechanisms through which this paper suggests that institutions were changed after the auditing program started. There are two and they are related to law enforcement and media exposition. With regard to law enforcement, as previously mentioned, CGU needed to send detailed report to the public bodies which are responsible for investigation and prosecution of mayors.

For each municipality audited, a summary of the main findings is posted on the internet and disclosed to media sources. From 2003 to 2014, 2144 cities were selected in 27 selection rounds, with 120 cities being selected twice, and 3 cities selected three times. This corresponds to 38% of the total of Brazilian municipalities, and comprises federal public funds of more than $ 21 billion. Up to mid-2013, a total of 3,670 publics employees had been dismissed and 660 mayors had been impeached or banned from public office.[5]

[5] CGU official reports

For example, analyzing the CGU audit reports in 32 cities in the states from the Brazilian North region between 2010 and 2011, in education alone, the CGU technicians recorded 619 irregularities, resulting in an average of almost 20 per municipality. Of the total detected problems, almost 40% referred to mismanagement; about 30% indicated irregular expenditure (for example bidding fraud and overcharging,); and 17% referred to lack of accountability - a strong indication of corruption. These reports indicate an unpreparedness among employees in several cities: 241 irregularities were due to lack of administrative control, an average of 7.5 per city. The reports bring cases of inventory control and distribution of food inefficiencies; resources applied after deadlines; errors in hiring responsible staff for jobs, failure to develop basic designs for day care; lack of control over data on vehicles and drivers in transport programs; inadequacy or absence of registration of students; and lack of technical knowledge to operate the computerized system for the distribution of textbooks. They found 142 irregularities linked to the use of FUNDEB resource in these 32 cities, of which 70% relate to the lack of provision of resources and irregular bills and expenses such as purchases made without competitive bidding, which suggested strong signs of corruption.

After an irregularity is found an Administrative Disciplinary Process (ADP) is instigated that specifies the necessary administrative improvement. If the administrative tasks to reduce the damage are not implemented in a timely manner it is characterized as a severe violation of legal rules. In this case The Special Account Taken (TCE)[6] must be implemented immediately to identify responsibility for the violation and initiate financial compensation.

Our understanding is that when mayors and civil servants were caught engaged in corruptive activities, they were ousted from city management and, therefore, corruption in the public administration of that city was discouraged as other civil servants were intimidated. This less corrupt city administration is likely to be more effective, leading to better public policies and, therefore, higher growth in the analyzed period.

The second mechanism relates to media exposition. Even in cases where the illegal activities that mayors and civil servants engaged in were not enough to oust them from power, the media were able to access publicly available audit reports and use them as political propaganda. As shown by Ferraz and Finan (2008), evidence suggests that information from the audits was exposed to voters during the municipal elections. The authors reproduced newspaper sections whose accounts of the audit reports were widely used in the political campaigns. Indeed, Ferraz and Finan (2008; 2011) show that CGU auditing improves the quality of politics because it increases the cost of corruption, due to the risk of losing political support or being convicted if the acts are discovered. As a result, the probability of being investigated, exposed and somehow punished is a key component when deciding the level of corruption.

On the other hand, Brollo et. al., 2013, using the same CGU report information, demonstrated that higher government revenues can attract less scrupulous politicians and thus exacerbate the political agency problem and deteriorate the quality of politics. In other words, raising government budget can worsen political quality.

As previously mentioned, CGU started its auditing program in 2003, randomly selecting municipalities to be audited with regard to public money invested in several areas at city level.

[6] *A Tomada de Contas Especial* - TCE is an instrument available to the Public Administration to seek compensation for any damage as may be caused. The process coated own rite and opened only after the all administrative measures have been exhausted to repair the damage. http://www.cgu.gov.br/assuntos/auditoria-e-fiscalizacao/avaliacao-da-gestao-dos-administradores/tomadas-de-contas-especiais/arquivos/manualtce.pdf
http://www.cgu.gov.br/assuntos/auditoria-e-fiscalizacao/avaliacao-da-gestao-dos-administradores/tomadas-de-contas-especiais/arquivos/manualtce.pdf

2003 was the third year of their term for mayors who took office in 2001. As the auditing program was an innovative and unexpected initiative, we can assume that, by the third year in power, mayors had already established their city management practices and, if it were the case, had been engaged in corruptive activities in previous years. The results from this first audit were only released in 2004, so their effects were not apparent before that. However, as mayors in their last year of mandate have only nine months before the elections in October to deliver policies, the last three months are normally dedicated to government transitions, and the nine months (from January to September) preceding the elections are almost completely dedicated to campaigning, our study will consider the effects of the CGU audit program from the first year of mandate of the newly-elected mayors in 2005. This group of mayors are considered to be aware of the auditing program, as well as its effects with regard to law enforcement and media exposition and, therefore, would be discouraged from engaging in corrupt activities, a feature of better institutional conditions that might lead to more effective management practices and higher growth.

Our strategy consists of exploiting the fact that the CGU audit is randomly conducted. Because of this, some voters know the about the audit report before the next election, while voters in other municipalities only know after the election. Therefore, we compare outcomes of municipalities audited before the 2004 election with those of municipalities whose audit results were disclosed afterwards, and this way we can identify the growth and social effect of the disclosed corruption (Ferraz and Finan (2008; 2011) and Brollo et. al. 2013). It is important to emphasize that some kind of irregularity (embezzlement, overpricing in bidding and/or fraud) was detected in all 720 municipalities with up to 500,000 inhabitants, audited by the Comptroller General, from 2005 to 2008[7].

Methodology

This paper use the theoretical federal transfers (or FPM theoretical), defined in previews section, as our key to the identification strategy. These transfers are discontinuously established according to the population size of the municipality with thresholds predetermined by law, which provides the source of exogenous variation on the treatment status. Thus, since there is a difference between the received (or transfer) and the regulated theoretical transfer, we use the latter as instruments on the actual transfers and compare municipalities around each cutoff of population size, as was discussed in detail in the empirical strategy section. We now describe of the mechanism that determines the FPM allocation to municipalities.

The Federal Constitution of Brazil categorized the municipalities into ”capitals” and ”inner cities” and define the FPM criteria for allocation fixing 10 percent of the total FPM amount to capitals and the remainder to inner cities. Decree 1881, dated August 27, 1981, created a new municipality category named *reserva*, including all municipalities with a population over 156,216 inhabitants (this total changed to 142633 since 1997), and fixed a portion of 3.6 percent is allocated to the *reserva* municipalities, 10 percent to capitals, and 86.4 percent to the remaining cities.

Indeed the FPM distribution rule generates 17 cutoffs. We define the treatment group as the municipalities that are on the right side of each population cutoff. Let yi(1) be the potential outcome of the municipality i if the municipality is “treated”, i.e., to the right of the population cutoff and let yi(0) located to the left of the population cutoff be the counterfactual (control

[7] For more detail about CGU audit findings, see the article published by g1-globo.com (25/06/08)
http://extra.globo.com/noticias/brasil/cgu-aponta-corrupcao-em-720-prefeituras-532300.html

group). The problem is that I cannot observe both outcomes at a given point of time. The assumption of the identification strategy is that municipalities close to the discontinuity points are similar to each other but by chance some had a few more people than other so they receive a different level of FPM.

The Federal Constitution of 1988 established the FPM in Art. 159 (Ib), and since 1993 the share of IR and IPI has been fixed at 22.5 percent. The total transfer amount allocation criteria is different for each category of municipality. For inner cities, which represents the majority of municipalities, the total amount of municipality FPM is obtained from the followed function:

$$\mathrm{FPM}_{i,t}^{k} = \left(0.864\mathrm{FPM}_{\mathrm{total},t}\right).\left(\frac{\lambda_s}{100}\right).\left(\frac{\lambda_i}{\sum_{i\in k}\lambda_i}\right)$$

where $\mathrm{FPM}_{\mathrm{total},t}$ is the total revenue (0.225·IR+0.225·IPI) allocated to all Brazilian cities i in year t, λs is a distinct coefficient for each Brazilian state *k*, and λ_i is the municipality coefficient derived from the population thresholds. Smaller municipalities in terms of population size correspond to lower coefficients. This mechanism allows different municipalities sharing equal population size to receive the same FPM amount only if they belong to the same state.

Table 1: Municipalities'FPM coefficients

Population Brakets	
Below 10,188	0.6
[10,188 13,584)	0.8
[13,584 16,980)	1.0
[16,980 23,772)	1.2
[23,772 30,564)	1.4
[30,564 37,356)	1.6
[37,356 44,148)	1.8
[44,148 50,940)	2.0
Above 50,940	from 2.2 to 4.0

Note: FPM coefficients used to allocation of federal transfer

The Brazilian Institute of Geography and Statistics (IBGE) annually estimates the population size of the municipalities and the Federal Court of Audits (TCU) set the constant factors for each population brackets. Table 3 shows the constant values for each population bracket. Since Brazilian capitals essentially differ from the rest of the municipalities and almost 88% of cities have population below 47,5448, we have excluded the capitals and concentrate our empirical analysis inside this range, which includes the first ten thresholds. For the *reserva* cities, the FPM allocation is derived from the followed formula:

$$\mathrm{FPM}_{i,t}^{*} = \left(0.036\mathrm{FPM}_{\mathrm{total},t}\right).\left(\frac{\theta_{\mathrm{pop}}\theta_{\mathrm{income}}^{k}}{\sum\theta_{\mathrm{pop}}\theta_{\mathrm{income}}^{k}}\right),$$

[8] Note that this value is the average point of the seventh population interval of Table 3.

Table 2 presents the means of actual transfers and our predicted transfers by municipalities according to both previous functions. To better adjust our key identification for reasons explained in the empirical strategy section, the sample
is restricted to inner and *reserva* cities audited between 2003 and 2008. For each cutoff, we take municipalities inside the range, between the average points of each population size interval. For example, for the second cutoff (13,584) we take the expected value of actual transfers (and predicted FPM) for municipalities with a population above 11,885 and below 15,282 inhabitants. Overall, the total amount of predicted transfers surpasses the real value received, reflecting the allocation inconsistencies of federal transfers.

Table 2: Means of Actual and Predicted Transfer for Municipalities at the Threasholds

Population Size	Actual Transfer	Predict Transfer	No. Obs
6,794 - 11,883	53.62	37.68	3789
11,886 - 15,281	72.82	52.69	1800
15,284 - 20,370	91.71	66.30	1916
20,385 - 27151	104.35	76.06	1521
27,189 - 33,945	119.64	87.03	966
33,989 - 40,740	135.50	99.16	587
40,762 - 47,510	150.04	110.93	408

Note: Average of actual and predicted FPM transfer by population interval in years 2005 to 2008

Figure 1 and 2 depicts the theoretical FPM, FPM relative transfers (FPM transfer divided by al expenditure (AllExp)) and the devolution against the IBGE population estimates[9]. I pool the observations together and normalize the population size as the distance to the closest threshold. Specifically, I analyze the observations pooling the thresholds 1 to 6 (population up to 50,000) and thresholds 1 to 4 (population up to 27,000). To deal with symmetric cutoffs, I restrict the analysis for municipalities with more than 6,792 people[10]. The validity of this instrument depends on: First, each cutoff group has the same functional form; Second, there is a constant treatment effects across cutoffs and Thierd, centering assignment by cutoff group weighs units appropriately for estimating desired treatment effects. Papers as Brollo, Nannicini, Perotti, and Tabellini (2013) and Da Mata (2014) have used the same FPM rule and also apply a similar pooling approach to gain statistical power.

[9] Figure 1 and 2 scatterplot respectively of FPM and devolution averaged over 100-inhabitant bins plus running-mean smoothing performed separately in each interval between two thresholds.

[10] The first cutoff separates two groups: municipalities with 6,792 to 11,885 inhabitants.

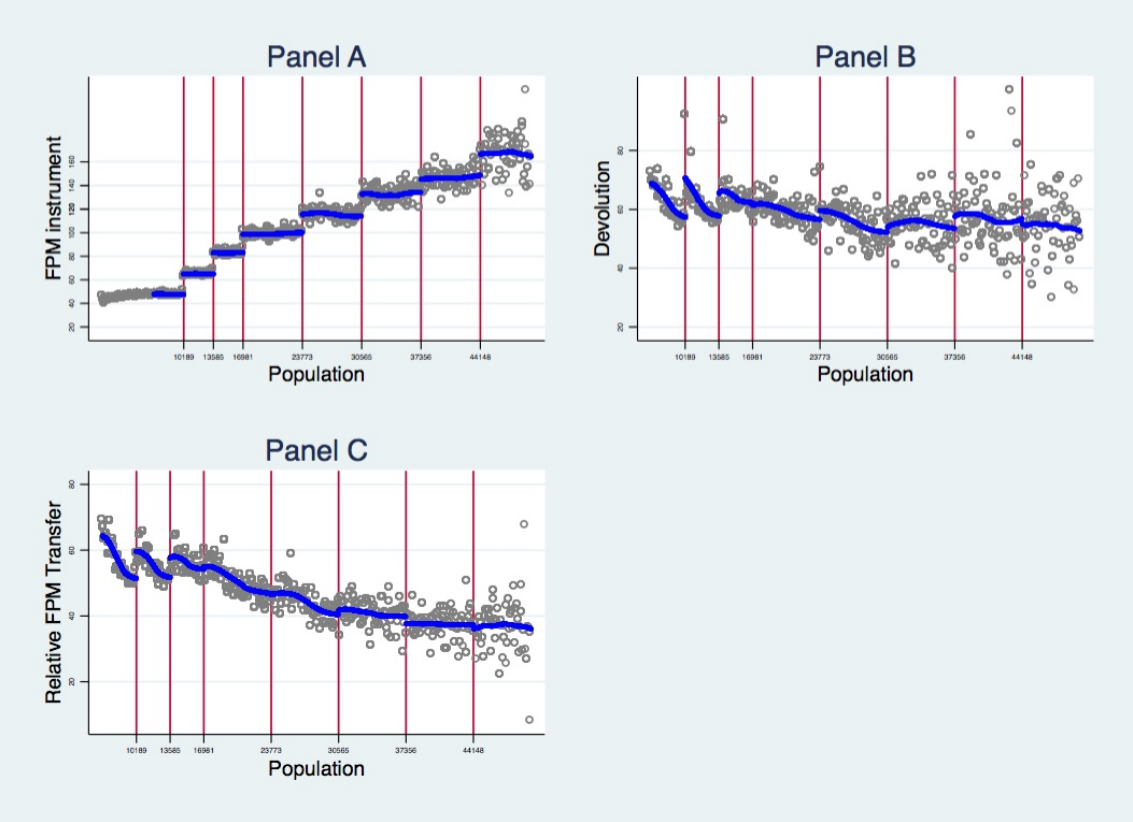

Figure 1. Instrument and Theoretical FPM Transfers and Devolution, up to 50,000 inhabitants: 2001-2009.

Notes: Panel A: scatterplot of theoretical FPM versus population size and scatterplot averaged over 100-inhabitant bins plus running-mean smoothing performed separately in each interval between two thresholds. Panel B: scatterplot of Relative FPM transfers versus population size scatterplot averaged over 100-inhabitant bins plus running-mean smoothing performed separately in each interval between two thresholds. Panel C: scatterplot of devolution versus population size and scatterplot averaged over 100-inhabitant bins plus running-mean smoothing performed separately in each interval between two thresholds.

Figure 1, panels A, B and C show the observations pooling the thresholds 1 to 6 (population up to 50,000). Panel A, display the theoretical transfers and it suggests the positive relation between FPM theoretical and population as expected. There, by construction, the jumps at the seven thresholds are sharp. Note that also theoretical transfers show some within-bracket variability because of the different share received by each state, and this variability increases with population size.

The Panel B and C depict the average negative relation of relative transfer and devolution versus population cutoff (figure 1). A scatterplot where transfers (devolution) are both averaged over cells of 100 inhabitants, plus the smoothed average of transfers (devolution) - solid line - calculated separately in each interval from one threshold to the next. Both figures display visible jumps at the transfer (devolution) in first, second. Because we are working with a relative not absolute measures some noise persists around each threshold, pointing to possible cases of misalignment. This is evident when we compared Panel B and C with Panel A, which display the theoretical transfers.

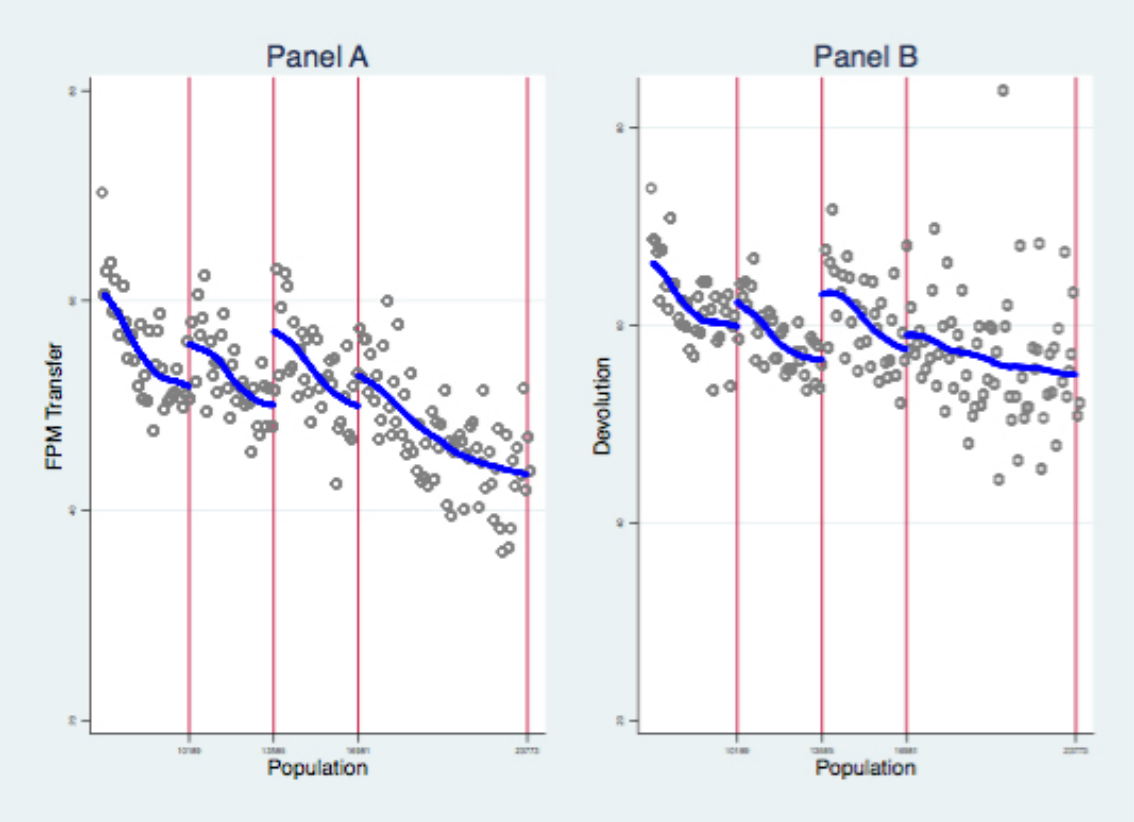

Figure 2. Instrument and Theoretical FPM Transfers and Devolution up to 27,000 inhabitants: 2001-2009.

Notes: Each point represents the relative transfer FPM (Panel A) and devolution (Panel B) in 2001-2009 for the municipalities in each bin. Bin-width equals to 100. Solid curve - Panel A and B - is a local linear smoother fit separately for each population cutoff.

Figure 2, panels B and C depict the average negative relation of relative transfer and devolution versus population cutoff by thresholds 1 to 4 (population up to 27,000). A scatterplot where transfers (devolution) are both averaged over cells of 100 inhabitants, plus the smoothed average of transfers (devolution) - solid line - calculated separately in each interval from one threshold to the next. Both figures display visible jumps at the transfer (devolution) in all cutoffs.

Empirical Setup

We began our sample in 2005 because this was the first year that mayors were mandated after CGU auditing had started. We finished the sample in 2008 because this period allows us to capture a complete term of municipal government. To avoid legislative or institutional discontinuities we restricted our sample to municipalities with a population below 50,940. This corresponds to 90% of all Brazilian municipalities and 34% of the population. The GDP is deflated by the general index price (IPCA, base = 2013) and considered in per capita terms and in Brazilian currency. Table 1 below shows the descriptive statistics of our sample.

Table 3: Descriptive Variables: 2005 and 2008

	2005			2008		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
GDP per capita (R$)	4,841	11,712	12.9	5,095	14,156	15,570
Population	4,841	26,703	62.7	5,095	26,984	63,000
FPM transfer (R$100.000)	4,840	78.8	69.1	5,095	112.0	99.0
GDP per capita growth	4,841	-0.010	0.13	5,095	0.074	0.13
Health index	4,798	0.599	0.196	5,040	0.661	0.169
Education index	4,670	0.584	0.160	5,031	0.644	0.133
Relative Transfer Revenue	4,840	0.061	0.033	5,095	0.076	0.041
Devolution Revenue	4,840	0.069	0.032	5,095	0.087	0.039
CGU audited city	448	0.1	0.3	950	0.2	0.4

Source: FIRJAN (it have begun in 2005), IBGE (Brazilian Institute of Geography and Statistics), National Treasury and CGU report (it have begun in 2003).

In light of the theoretical discussion, decentralization resource from central government to municipalities theoretically improve the local economy, although the successes of decentralization depends on the existence of effective channels for the population to express their preferences. To teste this hypotheses we are answer two questions: (1) What is the impact of our decentralization measure on economic growth, health and education? (2) Is the CGU audit able to improve the outcomes performance throw corruption reduction (Ferraz and Finan, 2013)?

Indeed as discussed in previews section, our decentralization measures are endogenous, once a simultaneity causality with our outputs is supposed. To circumvent this problem we apply a fuzzy Regression Discontinuity Design (DD) exploiting the theoretical FPM discontinuities to capture the devolution and transfers impact on outcomes related to economic growth, education, and health.

The DD can be used when the treatment is a discontinuous function of an underlying continuous variable (Angrist and Lavy 1999, Van der Klauw 1996). The DD setup compares our outcomes for municipalities whose value of the underlying targeting variable is just below and just above the discontinuity. Formally, the treatment rule is:

$T = 1$ if $P \geq \overline{P}$ (treated group – T)
$T = 0$ if $P < \overline{P}$ (control group – C)

where P is the theoretical FPM population cutoff. Then with a large sample, it is possible to compute (for some ε):

$$E[y \mid \overline{P} \leq P < \overline{P} + \varepsilon] - E[y \mid \overline{P} - \varepsilon \leq P < \overline{P} =$$
$$E[y^T \mid T, \overline{P} \leq P < \overline{P} + \varepsilon] - E[y^C \mid C, \overline{P} - \varepsilon \leq P < \overline{P}]$$

The assumption is that as the ε goes to 0, the difference between the two groups in the absence of the treatment shrinks to 0. However, some municipalities with $x > \overline{x}$ do not receive a corresponding transfer (devolution). On the other hand, there are municipalities whose $x < \overline{x}$ will receive a higher transfer (devolution). Formally:

$p\,(t = 1) = p_1$ if $P > \overline{P} =$
$p(t = 0) = p_0$ if $P < \overline{P}$, with $p_1 > p_0$.

Calculating the difference in outcome between municipalities just above and just below $\overline{P}$.

$$E[y\,|\overline{P} \leq x < \overline{P} + \varepsilon] - E[y\,|\overline{P} - \varepsilon \leq x < \overline{P}]$$

For assumption, once ε is small enough, the outcome in the absence of treatment is almost the same in the two groups; therefore, we can attribute this difference to the difference in the probability of treatment. However, there are some treated people and some control people on both sides of $\bar{x}$. To obtain the effect of the treatment, the literature suggested the fuzzy strategy. Because we are working with relative measure our asymptotically hypothesis is biased, therefore we have to construct an instrument and estimate the IV versions of the DD setup ((Hahn, Todd and der Klaauw 2001)).

The several cutoffs in our sample permit us work with two approaches for estimation: global methods (global polynomial estimators) or local methods (local linear regression). Although, by applying local methods, we can obtain low bias it has a useful interpretation whether the sample of observations around the cutoffs are as dense as possible. However, our sample is not sufficiently dense at the cutoffs (figure 7 and 8) so we cannot observe enough counterfactuals around the cutoff. Therefore, we work with global polynomial estimators and include up to a fourth-order polynomial in the regressions (spline polynomial approximation).

To test if decentralization resource has a positive impact on our outcome we have estimate the reduced form of the model is:

$$desc_{it-1} = g(P_i) + \delta\, instrument_{it-1} + \gamma_t + \eta_k + \zeta_{it} \qquad (1)$$

$$y_{it} = g(P_i) + \theta\, \widehat{desc}_{it-1} + \gamma_t + \eta_k + \varepsilon_{it} \qquad (2)$$

where, y_{it} is our three outcomes; *desc* represents our two decentralization measures; $g(\cdot)$ is a high-order polynomial in Pi; γ_t and η_k are respectively time and states fixed effects. The coefficient δ identifies the reduced-form (or intent-to-treat) effect of theoretical transfers on our decentralization measures, and θ captures the impact of decentralization measure on outcomes.

Under the exogenous instrument assumption, the above reduced-form effects can be used to identify the causal effect of decentralization measure on the outcome. When 2SLS regression is estimated, the theoretical transfers are used as an instrument for both decentralizations measure, equation (1).

Theoretically, there are several of regional factors deemed to affect economic performance. As a robustness we are testing if our results are sensible for inclusion of these characteristics following the equation bellow:

$$y_{it} = \beta_1 \widehat{desc}_{it-1} + X_{it-1} + g(P_i) + \gamma_t + \eta_k + \varepsilon_{it} \qquad (3)$$

where, X_{it} is a matrix of variables that control for economic performance, specifically: the share of industry, agriculture and service in municipalities GDP and conditional transfer (PAB and FUNDEB), describe in section 3.

Our second objective is to show that in cities in which the mayor was audited, devolution has a positive impact on outcomes. To identify this effect, we follow Brollo et. al. 2013, and combine our fuzzy DD with the identification strategy proposed by Ferraz and Finan (2008). As discussed before, our strategy consists of exploiting the fact that the CGU conducts audits at random. Because of this, some voters know the audit report before the next election, while voters in other municipalities only know after the election. Therefore, we compare outcomes of municipalities before the 2004 election with outcomes of municipalities whose audited has been disclosed after the election, and this way we can identify the outcomes effects of disclosed corruption. Eventually, we combine this strategy with the DD setup discussed above in order to test whether the interaction between decentralization and CGU audited, that for assumption improves the quality of mayor, has a positive impact on our outcomes when we compare municipalities outcomes above and below the theoretical FPM cutoffs. Formally, we estimate the following equations:

$$y_{it} = \beta_1 \widehat{desc}_{it-1} + \beta_2 cgu + \beta_3 (desc_{t-1} * cgu) + g(P_i) + \gamma_t + \eta_k + \varepsilon_{it} \quad (4)$$

where cgu is a dummy equal 1 if the municipality was audited before 2005 and zero if the municipality was audited after 2005. Once more, an IV regression is running, controlling by year and states fixed effect. In equation (3) the coefficient of interest is β_3, which captures the effect of interaction between decentralization measure and CGU auditing on our outcomes. With this model we are testing the assumption that the CGU auditing has a positive impact on our outcome when before and after thresholds are compared. In turn, the interaction represents the presence of substitution and/or complementary effect between CGU and decentralization. In other words, a positive β_3 mean that the effects are complementary, i.e. decentralization improves the outcome just in cities audited before 2005. Note that, in equation (4) the causal effects we have identified is local in sense that the iteration permit us the CGU auditing impact just before and after thresholds.

Results and Discussion

In this section, we test our two main assumptions. First of all, we tested whether the Brazilian decentralization strategy has had a positive impact on growth, health and education indexes. Second, we have tested whether municipalities where the corruption was disclosed by CGU audit, before the election, improved the quality of politicians and, for instance, improved governance showing better performance in our outcomes.

The Effect of Decentralization on Growth and Development

Table 4 estimate the IV fuzzy DD regressions —i.e. equations (2) and (3). Throughout, we control for a second-order polynomial in population size, as well as time and regional dummies. This table reports in the first row the estimated coefficients of overall effect (obtained by estimating a single regression on the entire sample) and In the remaining rows, we present heterogeneity results by focusing on individual threshold. These heterogeneous effects are captured by interacting equations (2) and (3) with a full set of dummies ranging from the midpoint below to the midpoint above every FPM threshold.

The column (1), (2) and (3) report the estimated coefficients of devolution on our three outcomes respectively (equation 2). In the first tree columns of table 4 devolution has a positive

and significant impact on GDP per capita growth (columns 1). However, it has a negative impact on health and education indexes (columns 2 and 3). From a quantitative point of view, an increase in the amount of devolution equal to 0.01 percentage point (13%) increase the per capita growth by 0.003 percentage points - i.e. raising the municipalities devolution in 13% increase the municipalities per capita growth in 4%. On the other hand, that devolution improved 0.1 an 0.08 perceptual points - i.e. the health and education indexes are reduced in respectively 15% and 12%.

Table 4: Global estimates effects of decentralization measure on GDP per capita growth, health and education with control variable (2005-2008)

	GDP per capita growth	Health	Education	GDP per capita growth	Health	Education
	(1)	(2)	(3)	(4)	(5)	(6)
Overall effect	0.266***	-1.082***	-0.893***	0.458***	-0.943***	-0.801***
	(0.061)	(0.096)	(0.074)	(0.075)	(0.119)	(0.095)
1st- threshold	0.430***	-1.325***	-1.324***	0.643***	-1.626***	-1.796***
	(0.155)	(0.207)	(0.160)	(0.189)	(0.317)	(0.306)
2nd- threshold	0.485***	-1.675***	-1.806***	0.897***	-1.951***	-2.232***
	(0.176)	(0.254)	(0.213)	(0.217)	(0.373)	(0.339)
3rd- threshold	0.575**	-2.115***	-1.957***	0.981***	-2.202***	-2.221***
	(0.240)	(0.272)	(0.232)	(0.272)	(0.377)	(0.364)
4th- threshold	-0.027	-3.067***	-2.072***	0.600*	-3.489***	-2.752***
	(0.280)	(0.394)	(0.301)	(0.333)	(0.571)	(0.553)
5th- threshold	-0.142	-4.495***	-3.353***	0.539	-4.686***	-3.761***
	(0.390)	(0.700)	(0.563)	(0.441)	(0.778)	(0.715)
6th- threshold	-0.543	-3.842***	-3.695***	0.227	-4.261***	-4.466***
	(0.622)	(1.097)	(0.994)	(0.651)	(1.168)	(1.135)
7th- threshold	0.286	-5.588**	-6.189**	1.074	-6.835**	-7.800**
	(0.778)	(2.448)	(2.637)	(0.904)	(2.953)	(3.325)
Ln(gdp per capita_t-1)				-0.085***		
				(0.007)		
% agriculture				-0.257***	-1.113***	-0.812***
				(0.062)	(0.123)	(0.112)
% industry				-0.147**	-1.048***	-0.706***
				(0.070)	(0.130)	(0.114)
% service				-0.276***	-1.185***	-0.780***
				(0.071)	(0.125)	(0.109)
Cond. Transfer				-1.058**	2.188**	2.576**
				(0.426)	(0.996)	(1.101)
Obs.	17,699	17,209	17,490	17,296	17,090	16,815

Notes: Effects of devolution on health and education for municipalities with population up to 50,000. The estimated coefficient of devolution (instrumented by theoretical FPM) controlling for a second order polynomial in normalized population size, time dummy and regions fixed effect as in equation (3)—in a regression where the dependent variable corresponds to each column heading, the control variables are specifically: the share of industry, agriculture and service in municipalities GDP per capita and conditional transfer. Robust standard errors clustered at the municipality level are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The columns (4), (5) e (6) explore the sensitivity of the results to the inclusion of covariates (equation 3). Indeed, dynamic cities have more industry and/or services and can collect tax, for instance it can growth faster and provide better health and education services. On the other hand, one can argue that dynamic cities can attract people, and this migration movement could both, reduce economic per capita growth and overcharge educational and health system. Therefore, the negative coefficient of decentralization measures may be associated with the fact that dynamics cities (with their higher economic performance) attract people and reduce wellbeing by overcharge security system. The DD approach potentially isolates the effects of confounders, therefore we extended that the inclusion of control variable do not change our results. Precisely, we use the share of industry, agriculture and service in municipalities GDP and conditional transfer (PAB and FUNDEB) as control variable.

The results in Table 4, columns 4, 5 and 6 show that the impact of intergovernmental transfers on outcomes stays almost the same as before. The share of industry, service and agriculture have a highly significant negative coefficient at economic growth, health and education, while relative conditional transfer is positive and significant just in health and education equation. When assignment to treatment is random, the point estimate should not change after including control variables. In the present analysis, the overall effect coefficient is is bigger when I include the controls in growth equation (column 4), however it is lower when I include other potential determinants of our outcome, in columns 5 and 6. It seems that the coefficient of control variables are capturing the positive effect of migration on economic growth, and the cited crowded effect of migration on health and education performance.

The Effect of Interaction between Decentralization and CGU on Growth and Development

Our second main question is whether higher decentralization in municipalities where the corruption was disclosed by CGU audit before the election has led to better performance in growth, health and education as suggested by Rodríguez-Pose & Garcilazo, 2015. To test this assumption we have combined our fuzzy DD design with the identification strategy used by Ferraz and Finan, 2008, and estimate equation (4) in order to compare our outcomes of disclosed corruption just above and below the FPM thresholds.

Table 5 reports the results for our three outcomes. In thesr regressions we are comparing municipalities that were audited and have had their corruption disclosed before the election with municipalities that have had their corruption disclosed just after the election, before and after thresholds. The data set is analyzed from 2005 to 2008. We are working with a small sample that include just municipalities that have been audited by CGU up to 2008 which correspond to 950 municipalities.

Table 5: Impact of interaction between decentralization measures and CGU auditing on Growth, Health and Education (2005-2008)

	GDP per capita Growth (1)	Health Index (2)	Education index (3)
	Panel A		
Devolution	-0.371***	-1.475***	-1.107***
	(0.106)	(0.218)	(0.163)
CGU	-0.047***	-0.162***	-0.135***
	(0.018)	(0.037)	(0.028)
devolution *CGU	0.285***	0.881***	0.750***
	(0.094)	(0.205)	(0.159)
Obs.	6,612	6,553	6,467

Note: The CGU audited impact is estimated as the effect of the interaction between CGU (i.e., a dummy equal to one if the audit report was released before the election) and our decentralization measures on the outcomes, as described in equation (4). In this regression we are working just with municipalities that were audited by CGU. We have included the GDP per capita in t-1at growth regression. All the control variables included interacted with the CGU dummy, are in these regressions as describe in equation (4). Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 5 the devolution and CGU have a negative impact on all outcomes, however the CGU and devolution interaction have a positive impact on growth Indeed, the CGU audited increase the per capita growth, health and education respectively in 0.238, 0.719 and 0.616 percentage point.

This quasi-experimental analysis found a positive impact of decentralization on GDP per capita growth, a negative impact on health and education (table 5). Testing if CGU auditing worked as a proxy for better governance, we found that municipalities whose audit happened before the election had greater GDP per capita growth and better performance in health and education (table 6). The interaction between both decentralization measures and CGU auditing have a positive coefficient in three regression. As expected these results suggested the importance of accountability to improve expenditure performance.

Conclusions

Could the decentralization strategy improve economic growth, health and education? This is important questions, because decentralization revenue spread in European countries and most developed and in development countries at the beginning of the 21st century. Since, according to a large literature, the success of decentralization depends on the existence of effective channels for the population to express their preferences, in other words growth depends on good governance.

Here, we have focused on two mechanisms that are of fundamental importance in a variety of situations: the decentralization resources from central government to municipalities

and CGU audits that punish corruption and improve governance. At the margins, higher decentralization resources induce more GDP per capita growth, and reduce health and education performance. Moreover, the interaction between decentralization revenue and audited reports gives rise to a complementarity effect: precisely, municipalities audited by CGU after election have the better per capita growth education and health performance when compared with municipalities audited after the election.

Nevertheless, additional resources are often given specifically to regions or countries with weak institutions, as in the case of Structural Funds to lagging regions in the European Union, or of foreign aid to developing countries. As a result of these policies, and if our estimates have external validity, the control of corruption is more important to improve growth than decentralization.

References

Afonso, J.R., 2013. Nuevos Acuerdos Fiscales para Reducir la Desigualdad en América Latina: Brasil. In Nuevos Acuerdos Fiscales para Reducir la Desigualdad en América Latina: Brasil. Santiago de Chile, pp. 1–18.

Afonso, J.R.R., 2006. Novos Desafios à Decentralização Fiscal do Brasil: As Políticas Sociais e as Transferências de Renda. In XVIII Seminário Regional de Política Fiscal. Santiago do Chile, pp. 1–34.

Agnew, J., 2001. Regions in Revolt. Progress in Human Geography, 25(1), pp.103–111.

Barca, F., 2009. An agenda for a reformed cohesion policy. A place-based approach to meeting European Union challenges and expectations, Brussels. Available at: http://ec.europa.eu/regional_policy/archive/policy/future/barca_en.htm.

Barro, R.J., 1991. Economic Growth in a Cross Section of Countries. The quarterly Journal of Economics, (May), p.38.

Brollo, F; Nannicini,T; Perotti,R and Tabellin,G.i, 2013. "The Political Resource Curse," American Economic Review, American Economic Association, vol. 103(5), pages 1759-96, August.

Ferraz, C.; Finan, F. Exposing Corrupt Politicians: The Effects of Brazil's Publicly Released Audits on Electoral Outcomes. The Quarterly Journal of Economics, MIT Press, v. 123, n. 2, pages 703-745, 2008.

Ferraz, C.; Finan, F. Electoral Accountability and Corruption: Evidence from the Audits of Local Governments. American Economic Review, S.i., v. 101, n. 4, p.1274-1311, jun. 2011.

Fukuyama, F., 2000. Social Capital and the Civil Society, Washington, DC.

Gregory, V., 2007. Imigração Alemã. In M. P. Coelho, ed. Povoamento, Brasil: 500 anos de. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística - IBGE, pp. 1–237.

Hermann, J., 2007. Cenário do encontro dos povos. In M. P. Coelho, ed. Brasil: 500 anos de povoamento. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística - IBGE, pp. 1–237.

IBGE, 2005. Base de Informações Básicas Municipais. Instituto Brasileiro de Geografia e Estatística. Available at: http://www.ibge.gov.br/home/estatistica/economia/perfilmunic/defaulttab1_perfil.sht.

IBGE, 2016. IBGE :: Instituto Brasileiro de Geografia e Estatística. Available at: http://www.ibge.gov.br/home/ [Accessed April 16, 2016].

IBGE, 2013. Portal Brasil. Portal Brasil, p.1. Available at: http://www.brasil.gov.br/economia-e-emprego/2013/06/cresce-numero-de-municipios-no-brasil-em-2013 [Accessed July 27, 2016].

Keating, M., 1998. The New Regionalism in Western Europe, Cheltenham: Edward Elgar.

Klugman, J., 1994. Decentralisation: A survey of literature from a human development perspective. UNDP Human Development Report Office. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2294658.

Maps of Brazil, 2016. Brazil my Country. Available at: http://www.brazilmycountry.com/brazil-map/ [Accessed July 1, 2016].

Martinez-Vazquez, J. & McNab, R., 2003. Fiscal decentralization and economic growth. World Development, 31(9), pp.1597–1616.

Mora, M. & Varsano, R., 2001. Fiscal decentralization and subnational fiscal autonomy in Brazil: some facts of the nineties. Texto para discussão 854, pp.1–32.

Morgan, K., 2002. English Question: Regional Perspectives on a Fractured Nation. Regional Studies, 36(7), pp.797–810.

Musgrave, R.A., 1959. The theory of public finance: a study in public economy, New York: McGraw-Hill.

Naritomi, J., Soares, R.R. & Assunção, J.J., 2009. Institutional development and colonial heritage within Brazil, Bonn.

North, D., 1990. Institutions, institutional change, and economic performance (Political economy of institutions and decisions), Cambridge, Mass: Cambridge University Press.

Oates, W.E., 1972. Fiscal Federalism, New York: Harcourt Brace Jovanovich.

Parker, A. & Serrano, R., 2000. Promoting Good Local Governance through Social Funds and Decentralization,

Prud'homme, R., 1995. The Dangers of Decentralization. In M. Syrquin, ed. The World Bank Research Observer. Washington: World Bank, pp. 201–221.

Putnam, R., Leonardi, R. & Nanetti, 1994. Making democracy work: Civic traditions in modern Italy, Princeton, NJ: Princeton University Press.

Rodden, J., 2003. Soft Budget Constraints and German Federalism. In J. Rodden, G. Eskeland, & J. Litvack, eds. Fiscal Decentralization and the Challenge of Hard Budget Constraints. MIT Press.

Rodríguez-Pose, A., 2013. Do institutions matter for regional development? Regional Studies, 47(7), pp.1034–1047. Available at: http://www.tandfonline.com/toc/cres20/current.

Rodríguez-Pose, A. & Bwire, A., 2003. The economic (in) efficiency of devolution. Environment and Planning, p.39.

Rodríguez-Pose, A. & Ezcurra, R., 2010. Is fiscal decentralization harmful for economic growth? Evidence from the OECD countries. Journal of Economic Geography, 11, pp.619–643.

Rodríguez-Pose, A. & Garcilazo, E., 2015. Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions. Regional Studies, 49(8), pp.1274–1290.

Rodríguez-Pose, A. & Gill, N., 2005. On the "Economic Dividend" of Devolution. Regional Studies, 39(4), pp.405–420.

Rodríguez-Pose, A. & Gill, N., 2004. Reassessing Relations between the Centre and the States: The Challenge for the Brazilian Administration. Regional Studies, 38(7),

pp.833–844. Available at: http://www.tandfonline.com/doi/abs/10.1080/0034340042000265287.

Rodríguez-Pose, A. & Gill, N., 2003. The global trend towards devolution and its implications, London.

Rodríguez-Pose, A. & Sandall, R.B., 2008. From identity to the economy: Analysing the evolution of the decentralisation discourse. Environment and Planning C: Government and Policy, 26(1), pp.54–72.

Rodrik, D., 2004. Getting institutions right, Cambridge, Mass.

Skidmore, T.E., 2000. Foreword: A new test for Brazilian Democracy Democratic. P. R. Kingstone & T. J. Power, eds., Pittsburgh.

Temer, M., 2016. Uma nova ponte: a verdadeira Federação. Estadão. Available at: http://opiniao.estadao.com.br/noticias/geral,uma-nova-ponte-a-verdadeira-federacao,10000007243.

Tesouro Nacional, 2015. Consolidação das Contas Públicas. Available at: https://www.tesouro.fazenda.gov.br/documents/10180/205489/Consolidacao_Contas_Publicas.xls [Accessed July 1, 2016].

Tesouro Nacional, 2016. Contas Anuais - Artigo Prefeituras e Governos - STN. Available at: http://www.tesouro.fazenda.gov.br/contas-anuais [Accessed April 16, 2016].

Thiessen, U., 2003. Fiscal Decentralization & Economic Growth in OECD High-Income Countries,

Tiebout, C.M., 1956. A pure theory of local expenditures. The Journal of Political Economy, 64(5), pp.416–424.

Varsano, R. et al., 1998. Uma análise da carga tributária do Brasil, Rio de Janeiro. Available at: http://www.en.ipea.gov.br/agencia/images/stories/PDFs/TDs/td_0583.pdf.

Venâncio, R.P., 2007. Presença Portuguesa. In M. P. Coelho, ed. Brasil: 500 anos de povoamento2. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística - IBGE, pp. 1–237.

World Bank, 2016. Definition of Administrative Decentralization. Available at: http://www1.worldbank.org/publicsector/decentralization/admin.htm [Accessed July 1, 2016].