

The Relation of Devolution and Quality of Institutions with Economic Growth of Brazilian Municipalities

Abstract

Devolution of fiscal capacity has been considered by governments all around the world an important force behind economic dynamism of sub-national regions. Since its last constitution in 1988, Brazil has been engaged in a controversial devolutionary. This paper aims understanding the relation of devolution and quality of institutions with economic, contributing to the current debate of to what extent, if any, and in which context should the Brazilian government devolve more fiscal capacity to this lower level of government. Using a new measure for devolution and considering institutional differences according to the evolutionary path of each Brazilian region, this paper applies an IV analysis and finds that, when good institutional quality is in place, devolution is positively related to economic growth. Therefore, in order to reap the benefits of any additional devolution, the Brazilian government should pay attention to the institutional arrangement of municipalities.

Resumo

A devolução da capacidade fiscal do governo central para as subnacionais do país tem sido considerada em todo o mundo como uma força importante por trás do dinamismo econômico destas regiões. Desde a constituição de 1988, o Brasil tem se envolvido em um controverso processo devolutivo. Este artigo visa compreender a relação entre devolução, qualidade das instituições e crescimento econômico. Contribuindo, desta forma, para o debate atual de até que ponto, e em que contexto o governo deveria transferir mais capacidade fiscal para suas subunidades. Propondo uma nova medida de desconcentração e considerando diferenças institucionais de acordo com o caminho evolutivo de cada região brasileira, este trabalho aplica a técnica de variáveis instrumentais e encontra que, havendo instituições fortes, a devolução está positivamente relacionada ao crescimento econômico. Portanto, para obter os benefícios de qualquer desconcentração adicional, o governo brasileiro deve prestar atenção ao arranjo institucional dos municípios.

Introduction

A trend towards many types of decentralization has affected the entire world over the past 40 years (Rodríguez-Pose & Gill 2005). Despite varying drastically from one country to another, different decentralizing processes can be categorized into three different discourses with regards to their motivations: the identity, the good governance and the economic efficiency discourses (Rodríguez-Pose & Sandall 2008). This study will focus on the economic efficiency discourse that has appeared more frequently in the recent years as a response to the effects of globalization. In a globalization process, the capacity of regions to engage in territorial competition becomes an important feature of the current world (Agnew 2001) as there is a common understanding that localities and municipalities are “the most suitable places to achieve economic dynamism in a globalized world” (Rodríguez-Pose & Sandall 2008, p.58). This discourse is closely related to the “new regionalism” agenda and its argument that devolution is a matter of counterbalancing the “economic and democratic deficit” of regions as sub-national governments are better prepared to improve economic dynamism and to promote

more accountable, participatory and transparent government (Tiebout 1956; Musgrave 1959; Oates 1972; Keating 1998; Morgan 2002).

Devolution could be defined as the statutory delegation of powers from the central government of a sovereign state to govern at a subnational level, such as a regional or local level. 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.

However, some paper suggested that the devolution performances depends on the degree of development of the country. There are studies that indicate increases in costs and losses in efficiency resulting from devolution (Costa-Font, Moscone, 2008 Crivelli; Leive; Stratmann, 2010). Some studies for countries with decentralized systems show inequalities in access and use between regions, favorable to the richest regions (Jiménez-Rubio, Smith, van Doorslaer, 2008). There are also results of positive impacts of decentralization on equity financing, but not so clear about the use of services (Bossert et al, 2003).

The current discourse is that, for the case of municipalities, governments have a certain level of responsibilities that is below the financial resources available to them, therefore more devolution is necessary. In this scenario of an imbalance of resources and responsibilities and a real possibility of movement towards changing these conditions, this paper aims at contributing to the ongoing discussion of to what extent, if any, and in which context should the Brazilian federal and state government devolve more fiscal capacity to municipalities. For this purpose, this paper posits the following research question: what is the relation of devolution and quality of institutions with GDP per capita growth of Brazilian municipalities from 2005 to 2012? Based on a strand of the literature that will be further discussed, this paper has defined the following hypothesis: devolution and good quality of institutions together at municipal level are positively correlated to higher rates of GDP per capita growth in the analyzed period (from 2005 to 2012).

This research intends to be innovative and contribute to the literature on this topic in four aspects. Firstly, it creates a new measure for devolution at the municipal level that overcomes some of the possible caveats of other proxies used for devolution at this level of government. Secondly, it applies a line of reasoning similar to what Acemoglu et al. (2001) proposed, differentiating the quality of institutions across Brazilian regions according to their process of colonization. Studies on devolution are normally conducted at state level due to availability of data, thus the analysis of devolution itself at the municipal level is a third contribution. Lastly, this research interacts devolution and regional quality of institutions to better understand the relation of devolution and municipal economic growth. This research applies fixed effect with instrumental variable model to help us understanding some important aspects of the proposed research question. This paper first reviews the theoretical discussion about devolution and quality of institutions and present how these two topic have evolved in the Brazilian context. Then it presents how the new measure for devolution was created and what are the assumptions considered with regards to quality of institutions of Brazilian geographical regions. Moreover, it will also discuss the strategy of analysis as well as the econometric model for the regressions. Forth, it will present the results and discussion. Finally, some conclusions.

Devolution, Institutions and Economic Growth

The mechanisms that are claimed to make local governments better capable of achieving economic development are under an overarching idea that devolution increases the overall efficiency of regions, a factor that is likely to induce economic growth (Martinez-Vazquez & McNab 2003). Efficiency, in turn, is defined as the ability of local governments to maximize the allocation and production of resources (Rodríguez-Pose & Bwire 2003). The allocative efficiency is related to the capacity of local governments to better allocate resources across the needs of their territories while the production efficiency is the capacity of governments to deliver services and goods at a lower unitary cost when compared to other tiers of governments. All in all, if local governments are in a better position to achieve these allocative and productive efficiencies, devolution makes sense as it is likely that the efficiency gains will be reflected in positive economic results (Rodríguez-Pose & Bwire 2003).

Once understood that the link between devolution and economic growth is to increase allocative and productive efficiency of governments, clarifying the mechanisms underlying this link is the next step. Tiebout (1956) explains that local governments are more capable of identifying the preferences of their citizens, a fact that leads to a better allocation of resources. This supposedly better allocative capability ends up increasing the efficiency of local governments as there is a reduction of provision of services that are not necessary according to the local conditions. For instance, one municipality might be in need of a more robust health system due to a peculiarity (e.g. in a region with high incidence of “Dengue Fever”), but the federal government allocates more resources to education due to a top-down nation-wide policy. In this case, if fiscal capacity were devolved, the municipal government would be able to better allocate the financial resources according to its needs. Another important mechanism is related to the competition that is induced by devolution (Tiebout 1956). This argument relies in the assumption that citizens are mobile and decide where to live according to a cost-benefit analysis of their preferences and places’ living costs (Tiebout 1956). In this sense, if municipalities can have full power on their budget, they might compete with one another to provide the best services at the lowest cost possible with the aim of attracting citizens to their territory, a process that increases municipal efficiency.

Another important mechanism that increases the efficiency of municipalities through devolution is the creation of an environment within the municipal administration that is more prone to innovation (Breton 1983; Thiessen 2003; Rodríguez-Pose & Bwire 2003). This innovation environment is a result of two forces that are related to devolution towards local governments. The first is that, according to what was previously mentioned, municipalities will compete with one another in order to provide the best services at lowest costs. This competition leads to innovation of processes, products and business models aiming at either improving services or reducing costs. The second is that, as local governments act in a much smaller scale than central governments, the effects and possible failures, which are the most likely result of any attempt to innovate, are also much smaller. Therefore, as the risk of failure is reduced, local governments are more willing to innovate than central governments. For instance, Brazilian municipalities are partnering with Non-Governmental Organizations (NGOs) in order to facilitate the provision of some health services. As municipalities have their own legislative power, they created the legal framework for this initiative very quickly and were also rapid to adequate it in the case possible failures that might happen. A similar initiative coming from the federal government would be more complex to implement as legislation would be valid for all Brazilian municipalities, increasing the impacts of any failure, and would have to be under scrutiny of federal legislative power, diminishing the flexibility of adaptation of the legal framework as federal legislative power is much less responsive to municipalities’ needs.

The informational advantage that municipal governments are claimed to have is also important on understanding the arguments that support the connection between devolution and economic growth of devolved localities (Klugman 1994). The idea behind this argument is that local agents (public leaders, politicians, public servants, and others) are much better informed about the conditions of their municipalities when compared to central governments. Therefore, when there is this inadequacy or asymmetry of information, it is harder for central governments to make decisions and evaluate the impacts of these decisions in an administrative and political position that is far from localities (Klugman 1994). This situation might lead to losses of efficiency when power is centralized in the hands of the central government. The last mechanism to mention is the improvement of efficiency due to better accountability and transparency that a process of devolution might lead (Klugman 1994; Rodríguez-Pose & Bwire 2003). Devolving fiscal capacity puts the tier of government directly responsible for the expenditure and provision of services much closer to the recipients of these services. This proximity, in turn, might lead to better transparency and accountability. According to Rodríguez-Pose & Bwire (2003, p.1910), fostering transparency and accountability “reduces bureaucratic complexity and increases citizens' monitoring capacity, stimulating further efficiency gains”. Transparency and accountability might also contribute to an improvement in the institutional conditions as they enhance trust among actors within a specific context (Putnam et al. 1994). An environment with more trust contributes positively for the delivery of public policies “by decreasing the costs of collective action and increasing the benefits of cooperation” (Rodríguez-Pose & Bwire 2003, p.1910).

On the other side of the debate, there are scholars who criticize the positive effects of devolution (Breton 1983; Prud'homme 1995; Rodden 2003; Rodríguez-Pose & Bwire 2003; Morgan 2002). Against the argument that local governments are more efficient than central governments, Prud'homme (1995) posits that this can only be true when economies of scale are not relevant for the service provision. By concentrating the demand of many localities, central governments have more bargaining power, therefore can negotiate better unitary costs and be more cost-efficient. A second argument against devolution is that the local governments might be more subject to elite capture and corruption than central governments are. It is argued that local politicians are more likely to be influenced by pressing demands from local interest groups “in matters such as taxation and authorization” and that national politicians and bureaucrats have less discretion than their local counterparts (Prud'homme 1995, p.211). Devolution is also criticized by the fact that it might create overlapping functions and power in the public administrative system (Breton 1983) and this can create ambiguity of responsibilities and increase the administrative costs of governments, two factors that reduce the overall efficiency of the system (Rodríguez-Pose & Bwire 2003). Another important critique of devolving fiscal capacity is that local governments might lack qualified human resources that are able to effectively manage complex tasks and services. Prud'homme (1995) suggests that national governments are more likely to offer better salaries, create attractive careers, and to have scale to invest in technologies that can help on the delivery of services.

Along with the devolution trend that is claimed to lead to a better condition of regions in the pursuit of higher levels economic growth, there is an emerging consensus that institutions matter for regional development (Rodríguez-Pose 2013). In a broader sense, institutions are for now defined as “the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction” (North 1990, p.3). More recently, even within mainstream economists, institutions have gained primary importance for economic growth (Acemoglu et al. 2005). For instance, Rodrik (2004) recognizes that, despite the caveats on the

understanding of which direction the causality mechanism works in the case of high-quality institutions and economic growth, institutions are crucial when assessing the determinants of growth of regions. In a study sponsored by World Bank to clarify the importance of institutions in the quality of the decentralization process in seven different countries, Parker & Serrano (2000, p.26) stated that “from an operational perspective, having enough capacity to get the job done is one of the biggest challenges confronting local institutions”. Several important reports on development such as Barca (2009) have emphasized that the reason why traditional development policies have failed is the constant neglect of institutional context of underdeveloped regions.

Despite the agreement that having the right institutions leads to more successful strategies of economic growth, the type institutions that matters and what are the mechanisms through which this connection works are still under development (Rodríguez-Pose 2013). Departing from the more general definition of institutions presented by North (1990), Rodríguez-Pose (2013, p.5) presents the concept separated into two: formal institutions (“hard” or “society” institutions) such as rule of law and property rights, and informal institutions (“soft” or “communities” institutions) such as norms, traditions and social conventions. With regards to more formal aspects of institutions, the improvement of rule of law, property rights, quality of public servants and others can lead to more accountable and transparent governments that, in turn, are more likely to implement quality and efficient policies (Rodríguez-Pose & Garcilazo 2015). For instance, Acemoglu et al. (2005) demonstrate that property rights are highly related to better income levels. In relation to more informal aspects of institutions, social capital and trust work reducing the transaction costs when there is asymmetry of information (Fukuyama 2000). Better informal institutions such as sharing the same culture, religion and values facilitate the cooperation between individuals and organizations and promotes the associational life that is necessary for the success of governments (Fukuyama 2000, p.1).

Background of Brazil

As devolutionary processes are normally very distinct from each other and depend on the context of the region where it happens (Rodríguez-Pose & Gill 2003), it is important to discuss the particular elements of this process in the case of Brazil.

In 2012, the final year of analysis of this study, the fiscal capacity of the federal, state and municipal governments were 57.5%, 24.4% and 18%, respectively (Afonso 2013). This data shows that, during this period, subnational governments, in special municipalities, not only gained responsibilities as previously demonstrated, but also financial resources to deliver public policies. Municipal governments almost tripled their fiscal capacity from 1960 (6.4%) to 2012 (18%). However, simply understanding the level of financial resources that are spent at local level might lead to wrong conclusions as it is possible to have similar levels of financial resources available at local governments, but completely different types of devolution due to the way that fiscal capacity was devolved (Rodríguez-Pose & Gill 2003). In the case of Brazilian municipalities, which is the focus of this study, one particularity to understand is that devolution has been mainly implemented through transfers of resources from federal and state governments and not through devolution of capacity to collect taxes locally. The revenue generated locally comes from few types of revenue sources that are, in the majority of municipalities, inexpressive when compared to the overall expenditure of these municipal governments, especially in less developed regions of the country. Therefore, with the fiscal gap at local level, municipalities are highly dependent on transfers. Table 1 represents the fiscal gap

in the structure of revenue and fiscal capacity in Brazil in the year of 2000, allowing us to identify that only 5.1% of the overall revenue is collected at municipal level, the rest of the 17% of financial resources available to municipalities was comprised of transfers from the central and state governments.

Table 1: Revenue and Fiscal Capacity (financial resources available) in the three levels of government in the year of 2000.

Level of Government	Type Tax	% Revenue	% Fiscal Capacity
Federal	Income Tax (IR)	13.5	57
	Tax on Industrialised Products (IPI)	4.9	
	Tax on Financial Operations (IOF)	0.9	
	Import Tax (II)	2.4	
	Export Tax (IE)	0.0	
	Rural Property Tax (ITR)	0.0	
	Payroll Social Insurance Contribution	15.3	
	Payroll Contribution to FGTS	5.2	
	Turnover Contributions	13.5	
	Net Profit Contribution (CSLL)	2.4	
	Bank Debit Contribution (CPMF)	4.0	
Others	5.2		
Total	67.3		
States	Value Added Tax (ICMS)	23.2	26
	Tax on Motor Vehicles (IPVA)	1.5	
	Heritage and Endowment (ITCMD)	0.0	
	Others	3.0	
	Total	27.7	
Municipalities	Tax on Services (ISS)	1.8	17
	Tax on Urban Property (IPTU)	1.5	
	Tax on Property Transfer (ITBI)	0.3	
	Others	1.5	
	Total	5.1	

Source: author's adaptation from Mora & Varsano (2001)

In order to understand the other specificities about the devolutionary process in Brazil at municipal level, it is important to analyze in details how the fiscal capacity of municipalities, the previously mentioned 17% in table 1, is comprised. This study will make these more specific considerations for the years of 2005 and 2012 because they reflect the period analyzed. It is

possible to see from table 2 that out of the total fiscal capacity of municipalities, the share that comes from taxes collected locally (Local taxes) in 2012 was 19%, a value that is higher than in 2005, but is still very low. The municipal governments at poorer regions, Northeast and North, rely even less on local taxes and their revenue from this source was 11% and 12%, respectively. The municipalities in Southeast have a much higher share of its fiscal capacity coming from local taxes: 23% in 2012. Another relevant aspect is the importance of the federal government in the transfer of financial resources to municipalities. Of the 65.9% of the transfers from other levels of government in 2012, the most important source is federal government with 28.7% of the total (central government transfers are also part of the Multi-level transfers). In table 2 is also possible to see the non-constitutional transfers which are resources that are transferred on the bases of specific partnerships among levels of government to implement programmers. These transfers contributed with only 1% of the total fiscal capacity of municipalities in 2012.

Table 2: Total revenue available to municipalities in the years of 2005 and 2012 according to revenue's sources. Source: author's creation with data from Tesouro Nacional (2016)

Year	Region	Fiscal Capacity %	Local taxes %	Constitutional transfers				Multi-level %	Non-constitutional transfers %	Other sources %
				Total %	Federal %	State %	Municipal %			
2005	Central-West	100	12.6	75.4	34.3	29.7	0.3	11.2	3.3	8.7
	Northeast	100	9.5	85.3	50.2	18.9	0.1	16.2	1.5	3.6
	North	100	9.4	84.1	43.4	24.6	0.1	16.1	2.1	4.4
	Southeast	100	22.9	61.8	23.7	29.8	0.2	8.1	1.0	14.4
	South	100	14.0	69.9	31.4	28.9	0.1	9.4	1.0	15.1
	Total	100	17.4	69.8	31.9	27.2	0.2	10.5	1.3	11.5
2012	Central-West	100	14.7	70.7	31.9	26.10	0.10	12.5	1.7	12.8
	Northeast	100	10.8	81.9	44.0	16.80	0.10	21.1	1.0	6.2
	North	100	12.0	79.5	36.2	22.10	0.10	21.2	1.5	7.0
	Southeast	100	24.4	57.7	21.4	26.00	0.00	10.3	0.9	17.0
	South	100	15.5	64.8	28.6	25.30	0.00	10.9	1.2	18.5
	Total	100	18.9	65.9	28.7	23.70	0.10	13.4	1.0	14.2

The last crucial point to mention is the conditionality that are in place when municipalities are executing their fiscal capacity. The first conditionality is that municipalities must spend 25% of all their current revenue in the development of education (Constitution of Brazil 1988). Still related to education, the FUNDEB (Maintenance Fund for Development and Support of Professionals in the Education System), which is one of the most important line of transfers of resources from other levels of government to municipalities and is part of the Multi-level transfers in table 4, must have at least 60% of all its resources applied to salaries of professors (Constitution of Brazil 1988). With regards to the health system, governments of municipalities must invest at least 15% of their current revenue in services and programmers related to health

(Constitutional Amendment 29 2000). With regards to expenditures in personnel, the Fiscal Responsibility Law regulates the expenditure in all levels of government. At municipal level, public administration cannot spend more than 60% of its current revenue with personnel and this 60% is divided into 54% for Executive power and 6% for Legislative power (Complementary Law Number 101 2000). The overall Legislative expenditure is also regulated by the Constitutional Amendment number 25/2000 in which it demands that minimum percentages of financial resources be channeled from the Executive to Legislative power. These percentages vary from 8% in municipalities with less than 100,000 inhabitants to 5% in municipalities with more than 500,000 inhabitants (Constitutional Amendment 25 2000). This list of conditionalities is not exhaustive, but are enough to demonstrate that, despite having increased the fiscal capacity at municipal level, local governments are highly restricted and controlled on where and how to spend. All in all, the general sense for municipalities and politicians at municipal level, despite having gained fiscal capacity over the last years, is that municipalities should get more power in terms of financial resources and autonomy. The Brazilian Constitutional Transfer is called *Fundo de Participação dos Municípios*- FPM and we are exploring their exogenous in our identification strategy.

Quality of Institutions

According to Rodríguez-Pose (2013), “measuring institutions – and, most of all, informal institutions – is virtually impossible”. Finding plausible measures to proxy institutions at municipal level in a developing country is even more complex. Therefore, this research will first present arguments that substantiate why the institutional panorama of Brazilian municipalities is diverse and then, based on these arguments, will assign to each Brazilian region a more general proxy for institutions that will be assumed to be the same for all the municipalities in that region. Table 3 summarizes the assumptions of quality of institutions for each of the 3 regions. The first argument that explains the existence of this institutional diversity in Brazil is related to the political and legislative autonomy that municipalities acquired after the 1988 Constitution. According to Article 30 of the 1988 Constitution, it is responsibility of municipalities “to legislate on subjects of local interest” and “to supplement federal and state legislation where applicable”, so localities can legislate on various topics such as Service Taxes (ISS) and Urban Property Taxes (IPTU) (Constitution of Brazil 1988). Article 31 states that the “control of the municipality shall be exercised by the municipal Legislative power” (Constitution of Brazil 1988) and this involves activities such as the approval of the actions and expenditures of the local Executive power. In some cases, there is also the involvement of other levels of government when necessary, but local Legislative powers are the first, and in many remote areas of the country the only, instance of control of the Executive Power. The possibility of legislating at municipal levels and this check-and-balance system under the responsibility of Legislative power are subject to political, cultural and social conditions of localities, a fact that leads to diverse and unique institutional arrangements across the country. For instance, alliances among politicians and public servants from the Legislative and Executive powers in one municipality might create an informal institutional context prone to corruption where the law enforcement supposedly applied by the Legislative power is ineffective. Or, without violating the law and more related to a formal institutional aspect, local legislation can pass specific laws such as the increase of Service Taxes (ISS) and Urban Property Taxes (IPTU) that might inhibit economic activity. These two examples show how the legislative autonomy of local

governments might lead to a diversity of institutions across municipalities that are in the same country and ruled by the same constitution.

The second argument is related to the way that the 5 Brazilian regions evolved since Brazilian colonization. According to Acemoglu et al. (2001, p: 1370), regions that were subject to different types of colonization might have developed different institutions “that persisted even after independence”. For instance, on the one hand, the Belgian colonization of Congo had an exploratory focus, therefore the macro-institutions taken to the colonized country were scarce and did not introduce important institutional aspects such as private property; while, on the other hand, British colonization of Australia did not have an exploratory focus and, therefore, introduced in the colonized country much better macro-institutions (Acemoglu et al. 2001). In the case of Brazil, despite having a single colonizer – Portugal – thus supposedly acquiring the same macro-institutions from its colonizer, micro and geographic characteristics influenced the way institutional arrangements were consolidated over time within the country (Naritomi et al. 2009).

Naritomi et al. (2009, p.20) shows that for Brazilian municipalities “geography alone explains 65, 30, and 20 percent of the variation in, respectively, *ln* income per capita, governance and land Gini”. At the beginning of the Brazilian colonial period, distance from Portugal was a very important factor in the decision of which areas to explore first and due to this proximity, the Northeast region was the first to be explored (Naritomi et al. 2009). First with the extraction of wood (Pau-Brasil) and then with the plantation of sugar-cane and production of sugar, a period named the Sugar Economic Cycle, Portugal imposed to Brazil two very extractive activities. These activities were mainly based on slavery, large rural properties in the hands of few, a patriarchal society, and the practice of rent-seeking activities (Naritomi et al. 2009, p.8). Thus, based on these extractive colonial origins of the Northeast region and on the arguments presented by Acemoglu et al. (2001), Brazilian municipalities in that region are likely have a different institutional arrangement that is more fragile and less effective than other Brazilian regions that had different colonization and settlement processes.

The less populated of the Brazilian regions, the North, only started increasing its population during XIX century. Up to this century, the region was mainly inhabited by indigenous people in an immense geographic area within the Amazon Basin (IBGE 2016). From 1840 to 1910, the Rubber Cycle, an also very extractive economic activity in the Amazon forest, created a migration influx to the states of this region. People from the Northeast region and Japanese immigrants moved to municipalities of the North to engage in the extraction of rubber. This initiative was short-lived and did not bring institutional and sustainable economic development for that region. More recently, aiming at increasing the population and development of this region, the Brazilian government started two development programmes: the first was the creation of a development agency dedicated to the North region named SUDAM and the second was the creation of a manufacturing pole with lots of tax incentives named Zona Franca de Manaus. These two initiatives also triggered a migratory influx to that area and contributed to the formation of its population. However, even with all these efforts, the North region is not yet economically developed, neither densely populated. The region has many remote municipalities where government and formal institutions such as public organizations are less present. Based on these facts, this research considers that the quality of institutions in this region is similar to that of que Northeast region.

Different from the type of colonization suffered from the North and Northeast regions, the Southeast and South regions were not under “constant and direct intervention” from Portugal and its extractive activities during the colonial period. In this direction, Naritomi et al.

(2009, p.5) states that “in these areas history was connected to activities developed by settlers at the margin of the colonial enterprises supported by the metropolis”. Corroborating to that different type of colonization that is likely to have led to a different and better institutional arrangement, Rio de Janeiro, a municipality in the Southeast region, was the place to where the entire Portuguese court flee during the Napoleonic expansion towards Portugal in 1808 (Hermann 2007). The entire court established itself in the municipality of Rio de Janeiro from 1808 to 1815, bringing with them around 15,000 people from the Portuguese elite and also several institutions (Venâncio 2007). This fact alone can be considered a positive institutional shock that did not happen in any other region of Brazil during its colonial time. Along with that, the immigration of other European nationalities to Southeast and South regions flourished from the second half of XIX century (Gregory 2007) and many immigrants came to these regions as part of the workforce for the coffee farms and settlements. These immigrants were mostly artisans, business man, and professors with the intention to settle in Brazil and begin a new life, a completely different objective and context when compared to the other immigrants that came with the intention to engage in the extractive-related activities in the Northeast and North regions. This set of factors is in line with what Acemoglu et al. (2001) proposes: having colonizers and immigrants with “more noble” objectives that settled in these parts of the Brazilian territory led to better institutional conditions of the municipalities of these regions.

Partially similar to what happened to Southeast and South regions, the Central-West region was not under an exclusive extractive colonization and also had an institutional shock similar to that of Rio de Janeiro in 1808. The expansion of the agricultural and livestock frontiers as a result of actions of the central government to modernize the Brazilian agricultural industry during the 1960s, 1970s and 1980s generated migratory flows of people from South and Southeast regions to the so far sparsely inhabited Central-West region. This fact alone was the main responsible for the settlements in the part of the country, also a completely different process of what the Northeast and North regions were subject in the evolution of their population. Second, the transfer of the capital from Rio de Janeiro to Federal District, which is in the hearth of Central-West region, in 1960, also brought structural changes for the region as many institutions, organizations, and highly qualified people suddenly moved to the new Brazilian capital. Understanding how the Central-West was formed and seeing its current level of development, the highest in the country along with Southeast region as showed in table 1, encourage us to say that institutional arrangement in the Central-West is better than that of the Northeast and North regions and in line with that of the South and Southeast regions.

Table 3: Author’s assignment for the Quality of Institutions according to the historical evolution of Brazilian regions

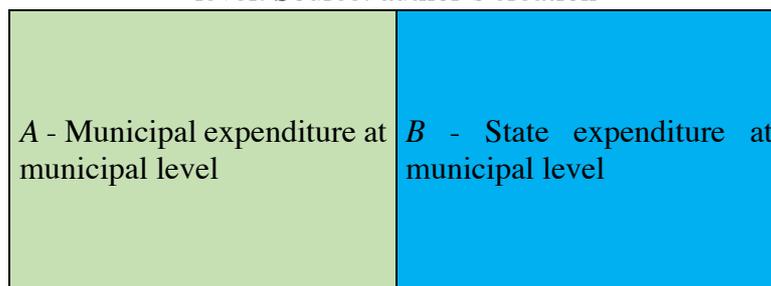
Region	Quality of institution
North (NO)	Bad
Northeast (NE)	Bad
Southeast (SE)	Good
South (SU)	Good
Central-West (CW)	Good

Data Set

This study analyzes the relation of devolution and quality of institutions with GDP per capita growth from 2005 to 2012 of 4,742¹ Brazilian municipalities. Brazilian municipal elections took place in 2004 and 2008, therefore the period from 2005 to 2012 reflects exactly two mandates of 4 years of municipal governments. In order to better understand this relation, this study created one new measure for devolution. It also applied a line of reasoning similar to what Acemoglu et al. (2001) proposes with the intention to understand how different regional institutional arrangements relate to devolution and economic growth. As far as this research is aware, no study has to date used a similar proxy for devolution at municipal level and an argument based on the rationale presented by Acemoglu et al. (2001) to understand the previously stated relation for the case of Brazil.

The most common measures in studies of fiscal decentralization are “the subnational share in total government expenditure and the subnational share in total government revenue” (Rodríguez-Pose & Ezcurra 2010, p.623). However, most studies are conducted at state level due to a better availability of data. Observing the representative scheme in figure 1, it is possible to observe that, for the case of Brazil, each tier of government is responsible for expenditures at municipal level, therefore the sum of *A*, *B* and *C* represents the overall expenditure made by all tiers of government in the municipal territory. Thus, devolution at municipal level also needs to consider these three variables. For the case of Brazil, there is disaggregated data available on *A*, meaning that there is availability of data on what each municipal government spends or collects (Tesouro Nacional 2016). However, there is no disaggregated data available on *B* and *C*, meaning that IBGE (2016) and National Treasury (Tesouro Nacional 2015) only releases what state and federal government directly spend at municipal level in an aggregated manner. Item *A* consolidates the overall expenditure of municipalities, meaning expenditure of financial resources coming from all tiers of government, but operationalized and spent by the municipal public administration at municipal territory. Items *B* and *C* consolidate the expenditure made by state and federal government directly at municipalities, bypassing municipal administration. Military police, which is operationalized and financed by the state government, but is delivered at the municipal level, is an example of expenditure in the *B* category.

Figure 1: Representation of all the expenditure² made at Municipal level. Source: author’s creation



¹ Brazil currently has 5,569 municipalities plus the Federal District, but the availability of data on the variables restricted the number of observations in this study to 4, 742 municipalities. State capitals, the Federal District (Brasilia) and Former federal regions (Acre, Amapá, Rondônia e Roraima) were intentionally dropped from the sample because they represent a specific pattern of municipality that is inserted in conurbations and access different sources of revenue (FPM – Participation Fund of Municipalities has different rationale to distribute resources to state capitals).

² The sizes of the squares are just a scheme to illustrate the fact that all levels of government spend in the municipalities.

	C - Federal expenditure at municipal level

The ideal proxy for devolution at municipal level would be to calculate the item A in relation to the sum of A , B and C for each Brazilian municipality i according to the formula 1 presented below. By doing that, it would be possible to understand the level of expenditure that is in fact devolved, meaning the expenditure made at municipal level by the municipal administration in relation to the expenditure made at municipal level by all levels of government.

$$Dev_i = \frac{A_i}{A_i + B_i + C_i} \quad (1)$$

However, as there is no disaggregated data for B and C for every municipality i , the operation in formula 1 was not possible and this research needed to create a disaggregated measure to proxy $A_i + B_i + C_i$ for each municipality i . In order to do that, this research conducted the following steps:

1. Gathered data for GDP in an Expenditure Perspective of every Brazilian municipality. For this type of GDP in Expenditure Perspective, the Brazilian Institute of Geography and Statistics (IBGE 2016) calculates the sum of private consumption (PC), government consumption (GC), investments (IN), and exports (EX) *minus* imports (IMP) for each municipality i as it is stated in formula 2. By analyzing government consumption (GC) in each municipality i , it is possible to proxy the absolute size of government in the economy of that municipality i .

$$GDP\ expenditure_i = PC_i + GC_i + IN_i + EX_i - IMP_i; \quad (2)$$

2. Summed the absolute size of government of every municipality i in the country and identified the overall size of government in the economy for all the Brazilian municipalities as stated in formula 3.

$$\sum_{i=1}^{5,570} GC_i; \quad (3)$$

3. Divided the absolute size of government of each municipality i (GC_i) by the overall size of government in the Brazilian economy (formula 3). By doing that, this study found the relative size of government ($GovS_i$) in percentage terms for every Brazilian municipality i (formula 4).

$$GovS_i = \frac{GC_i}{\sum_{i=1}^{5,570} GC_i} \quad (4)$$

4. Multiplied the relative size of government of each Brazilian municipality ($GovS_i$) by the overall expenditure made by all levels of government, which is the sum of A , B and C . This aggregated information ($A + B + C$) was organized by the National Treasury (Tesouro Nacional 2015). By doing that, this study was able to create a proxy for the overall government expenditure (all tiers of government) at municipal level (OGE_i) for each municipality i as expressed in formula 5.

$$OGE_i = A_i + B_i + C_i \approx GovS_i * (A + B + C) \quad (5)$$

5. Finally, this study resorted to formula 1 and calculated the level of devolution for each municipality i as expressed below, solving the problem of disaggregated data on the expenditures B and C :

$$Dev_i = \frac{A_i}{A_i + B_i + C_i} = \frac{A_i}{OGE_i} \quad (6)$$

Table 4 is the summary of descriptive statistics of the new measure for devolution created and it is possible to notice that the new variable Dev_i reflects what is expected as the level of devolution previously mentioned for Brazilian municipalities. The overall level of devolution towards municipal governments is 14% in 2005, which is approximately 4 percentage points lower than that of 2012 (18%). Capitals are relevant as their absolute expenditures are relevant in absolute terms (much larger municipalities) and their devolved fiscal capacity is much higher than the Brazilian average due to a larger tax base coming from local resources. Therefore, not having them in the sample diminishes the overall level of devolution presented in table 4.

Table 4: Fiscal Devolution at municipal level by region in 2005 and 2012

	2005			2012		
	Mean	Std. Dev.	Freq.	Mean	Std. Dev.	Freq.
Brazil	0.13	0.06	4,789	0.176	0.057	5118
North	0.09	0.07	333	0.134	0.051	364
Northeast	0.12	0.05	1,427	0.177	0.047	1556
Southeast	0.13	0.06	1,545	0.184	0.059	1587
South	0.14	0.06	1,165	0.172	0.056	1176
Central-West	0.12	0.06	419	0.190	0.072	435

Differences with regards to the devolution levels in regions are in line of what is expected: richer regions rely on larger local tax bases such as Service Taxes (ISS) and Urban Property Taxes (IPTU), therefore are more fiscally devolved. Considering the differences in GDP per capita and comparing with the devolution level in figures 2 and 3, it is evident that poor regions such as North and Northeast are, on average, less devolved while rich regions such as Southeast, South and Central-West are, on average, more devolved.

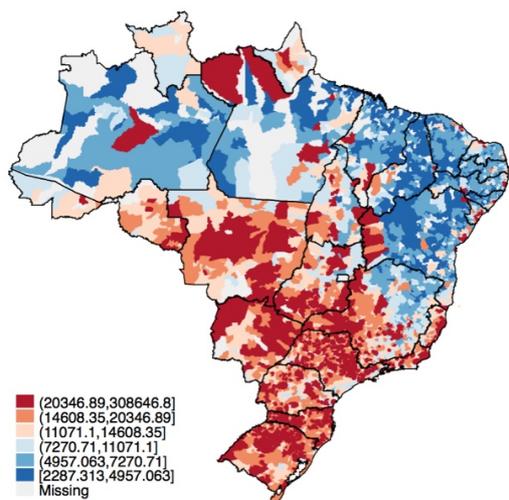


Figure 2: GDP per capita growth of Brazilian municipalities in 2012

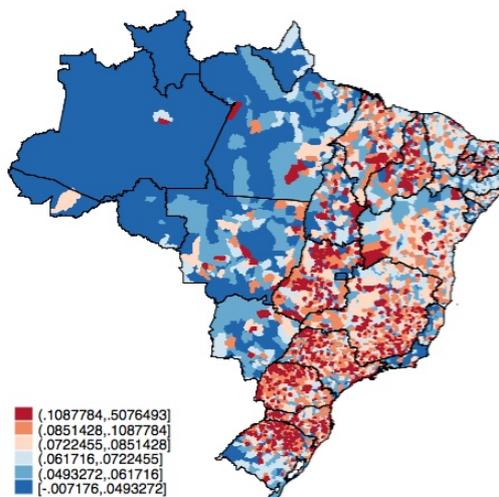


Figure 3: devolution of Brazilian municipalities in 2012

Because of the lack of data at this level of government, when devolution towards municipalities is analyzed, it is widely known that most studies use transfers from central to sub-national governments as proxy for devolution.

In this paper all variables are deflated by the general index price (IPCA, base = 2013) and considered in per capita terms and in Brazilian currency. Table 5 below shows the descriptive statistics of our sample for our variables.

Table 5: Description of control variables: 2005-2012.

Variable	Obs	Mean	Std. Dev.	Source
GDP per capita growth	60624	0.046	0.144	IBGE (2016)
ln(GDP per capita (R\$))	60624	9.156	0.727	IBGE (2016)
devolution	65782	0.150	0.060	Brazilian National Travel (2016)
Tax of infant mortality	61802	0.129	0.209	IBGE (2016)
% agriculture	65783	0.233	0.161	IBGE (2016)
% industry	65782	0.155	0.128	IBGE (2016)
% government	65783	0.265	0.143	IBGE (2016)
% service	65783	0.553	0.143	IBGE (2016)
ln(population)	60624	9.373	1.114	IBGE (2016)
population growth	60624	0.007	0.047	IBGE (2016)

Empirical Strategy

Aiming to test the research question and the hypothesis previously presented, an econometric model is estimated using panel data, which aims to assess the connection between government quality and regional growth and to establish whether the returns of Brazilian Central Government financial devolution is affected by the quality of the government of the regions receiving funds. Also controlled are a series of regional factors deemed to affect economic performance. In this model, the growth of GDP per capita across regions in Brazilian municipalities between 2005 and 2012 is specified by the following equation:

$$\Delta y_{it} = \beta_0 + \beta_1 \ln y_{i,t-1} + \beta_2 \ln Dev_{i,t-1} + \beta_3 (South * \ln Dev_{i,t-1}) + \beta_4 (South) + \Phi X_{i,t-1} + \eta_i + \tau_t + \zeta_{it} \quad (1)$$

where Δy_{it} is the average annual growth of real GDP per capita of municipality i in time t ; $y_{i,t-1}$ is the GDP per capita in the previous period in region i ; $\ln Dev_{i,t-1}$ is the previous period neperian logarithm of endogenous interest variable that measure the municipalities devolution; *South* is a dummy variable equal 1 municipalities belongs to Central West, Southeast and South regions and 0 un other cases; *South*lnDev_{i,t-1}*, represents interaction between the previous period neperian logarithm of devolution undertaken by the central government and our institutional measure; $X_{i,t-1}$ denotes the matrix of previous period variables controlling for other factors assumed to influence growth respectivaly: the tax of infant mortality; the participation of agriculture, industry, service and government in municipalities GDP; the municipalities population and density; and finally the municipalities fixed effect η_i , time dummy τ_t and stochastic term ζ_{it} .

The model specification considers a fixed effect (FE) panel regression model, with heteroskedasticity robust estimators and municipality (i) and time (t) controls. The sample of around 5000 municipalities in 5 Brazilian micro regions. The time period covered in the analysis is limited to the years between 2005 and 2012.

The main interest lies in the coefficients are β_2 and β_3 which intend to capture relation of devolution and the interaction between devolution and quality of institution respectivaly with economic growth.

The equation (1) fixed effect estimation must be interpreted with caution, because of the simultaneity causality between our outcomes and devolution variables. As identification strategy we are using instrumental variable describe below.

This paper use the theoretical federal constitutional transfers (or FPM theoretical), defined in Section 3, as instrument for devolution. The FPM is around 70% of all central government transfer to municipalities (table2). These transfers are 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.

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:

$$FPM_{i,t}^k = (0.864 FPM_{total,t}) \cdot \left(\frac{\lambda_s}{100} \right) \cdot \left(\frac{\lambda_i}{\sum_{i \in k} \lambda_i} \right) \quad (2)$$

where $FPM_{total,t}$ is the total revenue ($0.225 \cdot IR + 0.225 \cdot IPI$) allocated to all Brazilian cities i in year t , λ_s 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. The figure 5 below show the correlation between the average actual and theoretical municipalities FPM from 2005 and 2012, the $R^2=0.63$.

Indeed, since 1991 around 1080 new municipalities have been created in Brazil. Once, the municipalities that was divided receives a FPM proportionally larger than its population loss it makes the FPM proposed constitutionally differ from the one actually received by the municipalities. In addition, it is possible to identify a flaw in TCU's oversight, allowing some municipalities to receive more than constitutionally provided. Thus, since there is a difference between the FPM actual (or transfer) and the regulated theoretical transfer, we use the latter as instruments on the actual constitutional transfers.

Results and Discussion

According to the theories of Acemoglu et al. (2001) that different types of colonization lead to different institutional arrangements and that these differences persist overtime, this study suggests that the geographical regions of Brazil differ with regards to their institutional arrangements, therefore with regards to capacity to reap the benefits of any devolutionary policy. These regions and their differences can be clustered into two main groups according to table 3 where there is the Southern part of the country, comprised of Central-West, Southeast and South, with institutions that are classified as good, and the Northern part of the country, comprised of North and Northeast, with institutions that are classified as bad. Based on this definition we had used as a proxy for quality of institution an dummy variable equal 1 if municipalities belong to region with good institution: Central West, South and Southeast and zero for municipalities that belong to other three regions.

The aim of this model is establish the link between devolution and quality of institution with economic growth. In order to better explain devolution in a continental country with a diverse institutional context, it is crucial to disaggregate the analysis into a regional level. According to the theories of Acemoglu et al. (2001) that different types of colonization lead to different institutional arrangements and that these differences persist overtime, this study suggests that the geographical regions of Brazil differ with regards to their institutional arrangements, therefore with regards to capacity to reap the benefits of any devolutionary policy. These regions and their differences can be clustered into two main groups according to table 3 where there is the Southern part of the country, comprised of Central-West, Southeast and South, with institutions that are classified as good, and the Northern part of the country, comprised of North and Northeast, with institutions that are classified as bad. With this panorama presented, table 6 shows the regional relation of devolution and quality of institutions with economic growth of municipalities.

Table 6 below report both strategy of estimation FE and FE-IV. As expected the FE-IV devolution coefficient is bigger then FE regression model (table 6, columns (1) and (4)), suggesting that endogeneity problem was controlled. The FE analysis provides evidence that financial devolution from central government to Brazilian municipalities and institution proxy (south) have had a positive and statistically significant link with regional growth, (table 6 columns (1), (2) and (3)). The Both coefficients are positive and significant, except in regression

with interaction. The interaction between devolution and institutional quality is positive and significant, pointing that in regions with better institutional arrangements the municipalities have better economic growth. Rodríguez-Pose and Garcilazo, 2015 have found similar results for European Union.

Estimation results using IV strategy are reported in table 6, columns (4), (5), (6) and (7). After inclusion institutional quality proxies in our model, table 6, columns 5 and 6 financial devolution coefficients lose importance to explain GDP per capita growth. These results suggested that institution is the more important to explain economic growth than financial devolution. Indeed, leave in regions with better institutional condition (*south*) increase the GDP per capita growth in 4% on average.

Exploring those results, we estimate the equation 1 interacting financial devolution with each regional dummies instead of the South dummy, respectively: North(N), Northeast(NE), Center-West(CW), Southeast(SE) and South(S). The results show that the coefficients for all three South regions are positive and significant. Indeed, increase financial devolution in CW, S and SE regions raise the municipalities economic growth in respectively 0.17%, 0.2 and 0.22%. These results indicate that better institutional arrangement of these region with devolution allowed the municipalities located at the Southern part of Brazil to become more efficient, a fact that is likely to be converted into economic growth. On the other hand, The North and Northeast region did not present a significant coefficient, therefore, in this econometric model, devolution does not show relation with economic development of municipalities in those region. This might indicate that the bad institutional arrangement in that region does not allow municipal governments to increase their efficiency. For instance, the average qualification of public servants at the North and Northeast regions in the year of 2005 was lower than the country's average (IBGE 2005) and this can be an indicative of limited capacity to transform the autonomy and fiscal capacity into more allocative and productive efficiency.

Table 6: Independent variable GDP per capita growth:
2005-2012

VARIABLES	(1) FE	(2) FE	(3) FE	(4) FE-IV	(5) FE-IV	(6) FE-IV	(7) FE-IV
$\ln(\text{GDP pc})$	-0.572** (0.007)	-0.058** (0.002)	-0.062** (0.002)	-0.063** (0.005)	-0.058** (0.004)	-0.057** (0.004)	-0.065** (0.004)
$\ln Dev$	0.208** (0.023)	0.117** (0.013)	0.008 (0.021)	0.684** (0.133)	0.101 (0.088)	0.123 (0.109)	
<i>south</i>		0.035** (0.002)	0.000 (0.006)		0.035** (0.003)	0.043** (0.015)	
$\ln Dev * \textit{south}$			0.163** (0.026)			-0.036 (0.070)	
$\ln Dev * N$							0.168 (0.111)
$\ln Dev * NE$							0.030 (0.085)
$\ln Dev * SE$							0.202** (0.087)
$\ln Dev * S$							0.219**

<i>lnDev</i> *CW							(0.094)
							0.248**
							(0.095)

Observations	36,260	36,260	36,260	36,259	36,259	36,259	36,259
N of cod6	4,666	4,666	4,666	4,666	4,666	4,666	4,666

Obs.: The Variable Devolution and FPM theoretical was used as instrument in FE-IV regression are in logarithm and deflected to 2013=1. All variable described in table 5 (respectively: tax of infant mortality, % agriculture, % industry, % government, % service, ln(population)) and the lag of dependent variable were used as control variable. Cluster standard errors in parentheses: ** p<0.05, * p<0.1

Concluions

This paper has investigated the relation of devolution and quality of institutions at with GDP per capita growth of Brazilian municipalities from 2005 to 2012 and its main hypothesis was that devolution and good quality of institutions together at municipal level are positively correlated with GDP per capita growth. The analysis using an innovative proxy for devolution and the argument that the historical evolution of Brazilian regions influenced the formation of institutional arrangements of municipalities confirmed our hypothesis by showing that devolution is related to economic growth and that this relation is particularly stronger where the institutional conditions are better. To control for endogeneity of our interest variable we have used the FPM theoretical divided by expenditure as a instrument for devolution in IV2SLS regression.

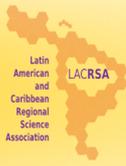
When analyzed in an aggregate manner for the entire country, devolution of fiscal capacity is strongest and significant variable. However, when analyzing devolution disaggregated into regions, the coefficient for the devolution of the regions become significant again just in South region in line with what was hypothesized in this research: for regions with good quality of institutions such as South, devolution has a positive and significant relation with economic growth. The coefficient for other regions were not significant, indicating that the worse institutional arrangement of municipalities might have diminished their capacity to become more efficient through devolution.

Devolution is in the agenda of the political discussions happening in Brazil nowadays. This research might inform these discussions by indicating that devolution, for the case of Brazilian municipalities, is positively related to economic growth. However, two other factors are very important to be considered when engaging in a devolutionary process. First, it is important to have a balance between devolution through transferring financial resources and devolution through transferring capacity to collect taxes locally. The latter might induce local governments to be more efficient and accountable as they need to make efforts locally to collect part of their financial resources, indeed the better collected tax structure is found in the south region. Second, the quality of institutions of municipalities is important when devolving fiscal capacity. So, initiatives to improve quality local institutions are welcome and can bring positive effects when fiscal capacity is devolved. This research suggests that further studies be conducted using a more elaborated analysis and more disaggregated proxies for quality of institutions at municipal level in order to confirm this research's findings.

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