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Political decentralization and income inequality in developping countries : does governance matter ?

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Abstract

This paper presents the novel empirical relationship between decentralization and income inequality in 39 developing countries for the period of 1990-2017. We examine the mediating effect of governance in explaining the relationship between decentralization and income inequality. We proxy decentralization by political decentralization. We use the Gini coefficient as our primary measure of income inequality and adopt three Kaufman indicators as a measure of governance. We use Feaseble Generalized Least Square method and System Generalized Method of Moment in two steps as a technical econometric estimation. Our main finding is that the effect of political decentralization on income redistribution in developing countries depends on the quality of governance. From the interaction term, the negative effect of the political autonomy of subnational governments is high principally as the corruption contol get higher. Thus, sub-national governments in developing countries, by independently implementing their redistribution policies, can actually improve income redistribution if they achieve an optimal level of good governance by improving corruption control.

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Introduction

The process of decentralization widely promoted in developing countries by international donors is seen by policymakers as a means of improving redistribution, which will ultimately reduce inequality (Digdowiseiso et al. 2022). However, the relationship between decentralization and inequality is complex. Much research, both theoretical and empirical, has attempted to shed light on the nature of the relationship between the two economic phenomena but remains inconclusive. According to the theoretical literature, many sub-national governments should be involved in redistributive policies, since decentralized redistribution increases inter-jurisdictional competition between local governments (Bahl et al., 2002). This creates incentives to 'vote by the feet' (Tiebout, 1956). However, such fiscal mobility results in a zero-sum situation that creates new economic costs for all competing regions (Martinez-Vazquez and McNab, 2003). Therefore, in the presence of uniformity of preferences of local populations for public goods and services across jurisdictions, Oates (1972) believes that the central government should play the redistributive role instead of local governments.

From an empirical point of view, the possibility that decentralization has affected income inequality remains ambiguous. Some authors find in their investigations that decentralization produces a beneficial effect on reducing income inequality (Sepulveda and Martinez-Vazquez, 2011; Tselios et al., 2011; Lessmann, 2012). Others, however, have observed that a higher degree of decentralization leads to a more unequal distribution of national income (Neyapti, 2006; Beramendi, 2007; Sacchi and Salotti, 2014). Goerl and Seiferling (2014) have shown that decentralization of redistributive spending does not seem to have a significant impact on income inequality.

Given the mixed results on the link between decentralization and inequality, we assume that the lack of understanding in the literature on this subject is based on indirect mechanisms. This link can be explained by the governance. On this point, Rodriguez-Pose and Ezcurra (2010) argue that decentralization can increase inequality in poor countries due to weak institutions and a high level of territorial disparities. Lessmann (2012) argues that the efficiency-enhancing effect of regional convergence is more likely to occur in countries with a good institutional environment. However, the role of political decentralization combined with governance is rather weak and implicit and has not been tested empirically. Political decentralization refers to the power that citizens and elected representatives have in the decision-making process (Shneider, 2003; Hooghe et al., 2016; Visković et al., 2021), and governance refers to how public authority is exercised (Murshed et al., 2015).

The objective of this paper is to contribute to filling this gap in the literature and to determine the mediating effect of the quality of institutions perceived by governance in the relationship between political decentralization and income inequality. To do so, we rely draw on the theoretical arguments of the potential for elite capture at the sub-national level highlighted by Bardhan and Mookherjee, (2000) as well as Prud'homme's (1995) administrative capacity as indirect channels of the link between political decentralization and income inequality.

The rest of the paper is organized as follows: The following Section I presents a review of the literature on the relationship between decentralization and inequality and the role of governance. We then present in section II a new dataset and methodology that are closely related to aspects of inequality in developing countries. Finally, in Section 3, we obtain the econometric results.

1. Review of the literature

1.1. The implications of fiscal federalism theory on income inequality

There are several theoretical arguments in the theory of federalism that explain the impact of decentralization on income inequality and offer a variety of answers as to what kind of effect the process of decentralization can have on income inequality.

The 'first-generation theory' of fiscal federalism argues that local governments should not engage in income redistribution (Oates, 1968; 1972; 1999). According to this literature, decentralized redistribution encourages 'poor' households to migrate to other jurisdictions where redistribution systems are more generous, while 'rich' households may migrate to areas with minimal tax and transfer regimes (Stigler, 1957; Musgrave, 1959; Oates, 1972). This 'vote by the feet' phenomenon would make redistribution at sub-national levels of government difficult, counterproductive and unsustainable (Tiebout, 1956; Prud'homme, 1995). In this case, income inequality within each homogeneous region might decrease, but this would be due to the immigration of the poor and the emigration of the rich, while income inequality at the national level would not be affected.

According to this stream of literature, a decentralized redistribution system should lead to lower levels of redistribution than is socially desirable (Tiebout, 1956; Prud'homme, 1995). In other words, local governments' attempts at redistribution through decentralization would be both too weak and ineffective to change the national income distribution. One should therefore expect a less balanced distribution of income among citizens and more inequality when redistribution policies are decentralized.

These first-generation claims are challenged by second-generation approaches to fiscal federalism (McKinnon, 1995, 1997; Weingast and Qian, 1997; Bahl et al. 2002; Padovano, 2007). Weingast and Qian (1997) argue that the 'foot-voting' of Tiebout (1956), which focuses on the extent to which local governments provide social benefits to their communities, may be more effective in reducing inequality than redistribution programs established by the central government. In this context, local governments, particularly in poorer areas, take advantage of less generous social provisions by adopting a policy of lowering taxes for businesses to attract more investment (McKinnon, 1997). This method creates more jobs within the jurisdiction. Ultimately, these mechanisms not only produce a high intensity of redistribution in local communities, but also reduce inequality.

1.2. The role of institutional channel of governance in the relationship between decentralization and income inequality

Many believe that decentralization can undermine redistribution if implemented in developing and transition economies (Bird and Vaillancourt, 1999; Rodden, 2002). All the risks associated with fiscal decentralization point towards a decrease in the quality of government decisions and an increase in the influence of elites. Bardhan and Mookherjee (2000) argue that local executives tend to be captured by their elites, even if they are democratically elected by vote. This results in a significant increase in the redirection of benefits to unwanted groups and corruption.

The goal of redistribution in developing countries becomes even more difficult to achieve because of already existing problems related to the capacity and competence of local agents (Prd'homme, 1995). Keefer and Knack (2002) explain that a poor quality bureaucracy can contribute to a higher level of inequality through a lower degree of enforcement of property rights. In principle, a higher level of bureaucratic quality requires stronger enforcement of the rules of impartiality, whereby the use of authority is not based on partisan considerations and interests (Rothstein and Teorell, 2008). Bureaucratic quality also requires autonomy, i.e. that

bureaucrats can set goals and achieve desired results. This autonomy must ensure the legitimacy of government so that citizens and political leaders support the programs designed and implemented by bureaucrats.

1.3. Some empirical evidence on the impact of decentralization on income inequality

The empirical literature contains several contributions on the effects of fiscal decentralization on inequality, especially in light of the evidence from the theoretical studies described above.

Beramendi (2007) on a sample of 15 OECD countries over the period 1980-1997, finds that a higher degree of fiscal decentralization leads to a more unequal distribution of income within a country, as decentralized governments may make different (or even opposite) redistributive decisions. More recently, Sacchi and Salotti (2014) find that a high level of fiscal decentralization is associated with a high level of household income inequality in a sample of 23 OECD countries. This suggests that, although decentralization is attractive for efficiency reasons, it has undesirable consequences from an inequality perspective.

Conversely, Tselios et al (2011) argue that fiscal decentralisation reduces interpersonal income inequality within regions using regionally aggregated microeconomic data for over 100,000 people in the European Union, although the precise effect depends on the level of development of each region. Sepulveda and Martinez-Vazquez (2011) test the relationship between decentralization and inequality, and suggest that fiscal decentralization reduces income inequality, provided that the size of the general government is at least 20% of the economy. Neyapti (2006) shows that revenue decentralization leads to an increase in inequality (measured by the Gini coefficient calculated on household incomes within the country) in 54 countries, but when combined with good governance, it can reduce inequality.

Digdowiseiso et al (2022) empirically examine the relationship between fiscal decentralization, vertical inequality and horizontal inequality. They focus on how institutional quality and military spending affect the relationship between fiscal decentralization and inequality in 33 developing countries over the period 1990-2014. Their results indicate that the impact of decentralisation on income inequality depends on the level of institutions and defense spending achieved by developing countries.

2. Data and methodology

2.1. Model specification

We examine the relationship between political decentralization and income inequality by considering the mediating role of governance. The model to be estimated is specified as follows:

$$IIN_{it} = \alpha + \delta DEC_{it} + \beta GOV_{it} + \rho(DEC * GOV)_{it} + \tau X_{it} + \mu_i + \theta_t + \varepsilon_{it} \quad (1)$$

Where country and year are represented by i and t respectively; IIN_{it} denotes the income inequality approximated by the Gini coefficient. Later we introduce the Palma ratio as an alternative measure of inequality. The indicator of political decentralization is given by the variable DEC_{it} ; the variable GOV_{it} is governance indicator ; $(DEC * GOV)_{it}$ represents the interaction term between political decentralization and governance. The coefficients of interest are δ, β and ρ ; X_{it} represents the control variables: GDP per capita in purchasing power parity and its squared value, the size of government, trade openness, and the annual population growth rate ; μ_i ; θ_t and ε_{it} respectively are the country fixed effect, the year fixed effect and the error term.

2.2. Data

Our sample is an unbalanced panel of 39 developing countries. The choice to restrict the number of countries to 39 is due to the lack of data in particular for decentralization. The study covers the period 1990-2017. Table 5 in Appendix 2 presents the list of variables in the model and their sources.

2.2.1. Dependent variable

As a dependent variable and for robustness purposes, we use three measures of income inequality. The GINI coefficient ϵ (0 100) with a value of 100 means very high inequality, is the most common measure of inequality, which can be defined in terms of income or consumption, and either for individuals or households. We first measure the income inequality by the Gini coefficient before any transfer. Secondly in the robustness check step, we capture the income inequality by the Gini coefficient after transfer, to take into account the government cash and the private transfers such as gifts, alimony or assistance from non-profits organizations. However, a problem with the use of the Gini coefficient is that it is an alternative measure that is not able to capture absolute income (Sonora, 2019). Therefore, we also use the Palma ratio, which is the ratio between the share of the richest 10% and the poorest 40%. This measure of income inequality has been used in several works including, Daly and Wilson (2013) and Sonora (2019).

2.2.2. Political decentralization

In this study, we use political decentralization as a measure of decentralization. It is measured by the Political Autonomy Index of sub-national governments from the Regional Autonomy Index (RAI) database by Shair-Rosenfield and al. (2021) and Hooghe et al. (2016) This indicator refers to the range of policies for which a local government is responsible.

2.2.3. Governance indicators

We consider in our study, three indicators of governance of Kaufman and Kraay (2017) taken from the WorldWide Governance Indicators (WGI):

- **Quality of bureaucracy or government effectiveness**, which approximates the quality and performance of the civil service and its level of independence from political pressures, the quality of policymaking and implementation, and the credibility of government engagement.
- **The rule of law**, which captures the degree of confidence citizens have in the rules devised by society and how they comply with them and, in particular, the enforcement of contracts, the competence of the police and the courts, and the perception of crime and violence
- **Corruption control,** captures the use of public power for personal gain, as well as the 'hijacking' of the state by elites and private interests.

2.2.4 Control variables

The control variables were chosen based on the literature review on decentralization and inequality (Sepulveda and Martinez-Vazquez, 2011; Sacchi and Salotti, 2014; Goerl and Seiferling, 2014 and Digdowiseiso, 2022). Here we control for the logarithm of GDP per capita in purchasing power parity and its squared value to test the Kuznets (1955) inverted-U hypothesis; the population growth rate; trade openness (measured by the sum of exports and imports as a percentage of GDP); the size of government (measured by total public expenditure as a percentage of GDP. These variables are taken from the World Bank's WDI database.

2.3. Estimation approach

We use the Feasible Generalized Least Square (FGLS) method. It has the advantage of taking into account the heteroscedasticity and autocorrelation errors of the panel. This method also has the advantage of controlling for country heterogeneity. However, it is based on the assumption of exogeneity of the explanatory variables in the model, which can be considered as a strong assumption. To overcome this limitation and for robustness reasons, the above model is also estimated by the System Generalized Method of Moment in two step (SGMM). The two-step SGMM is more robust than the one-step SGMM as it is very efficient and robust in the presence of heteroscedasticity and serial autocorrelation. This technique takes into account country heterogeneity as in the FGLS model. It also addresses the endogeneity problem of the endogenous variable when its lagged value is considered as an explanatory variable.

3. Estimation results

3.1 Baseline result

The results in Table 1 below aim to determine the individual effects of political decentralization and governance on income inequality (measured by the Gini coefficient before tranfer). Therefore the results are without interaction terms. It shows that political decentralization has a negative and no significant effect on income inequality in all specification of the model. However the quality of bureaucracy, rule of law and control of corruption positively and significantly affects the income inequality at the 1% level.

For the control variables, we find evidence for the validity of the Kuznets (1955) hypothesis on the U-inverse relationship between growth and income inequality. First, GDP per capita significantly increases income inequality at the national level and then the quadratic form of GDP per capita produces a reduction in inequality across the different specifications of the estimated model. The size of government significantly induces a reduction in income inequality, as does trade openness. The population growth rate has a positive and significant effect at the 1% level on all different specifications.

Thus, the baseline results provide an overview of the possible effect of political decentralization on income inequality.

Table 1 : regression of political decentralization and governance on Gini coefficient before tranfer

	(1)	(2)	(3)
VARIABLES	FGLS	FGLS	FGLS
POLAUTO	-0.2056	-0.1735	-0.0242
	(0.1464)	(0.1457)	(0.1413)
POPRATE	1.9143***	2.0280***	2.1966***
	(0.3117)	(0.3161)	(0.3029)
GOVEXP	-0.0205	-0.0179	-0.0548*
	(0.0326)	(0.0324)	(0.0315)
TRADOP	-2.8819***	-2.6400***	-2.8574***
	(0.4486)	(0.4351)	(0.4193)
GDPPC	37.3723***	37.0484***	41.8687***
	(5.3243)	(5.2846)	(5.0294)
GDPPC2	-2.0154***	-1.9830***	-2.2917***
	(0.2903)	(0.2862)	(0.2720)
QBUR	1.7731***		
	(0.4967)		

Rule of law		1.4951***	
		(0.4121)	
CORR			2.8001***
			(0.3606)
Constant	-115.8167***	-116.6348***	-133.3358***
	(24.7647)	(24.7885)	(23.6513)
Observations	589	589	589
Number of countries	35	35	35

*** statistical significaticance at 1%, ** statistical significaticance at 5% and * statistical significaticance at 10%.

3.2. Main results

For our main results we re-estimated each of the regressions in Table 1 by introducing interaction terms for each measure of governance with political decentralization to determine the mediating effect of governance in the relationship between decentralization and income inequality. The results are given in Table 2

Introducing first the interaction terms between political decentralization and governance, the direct effect of political decentralization is only visible when we control for rule of law (Table 2 column 2). Indeed, the political autonomy of local governments leads to a decrease of income inequality of -0.27 points following a unit increase at the 10% significance level.

Concerning the mediating effect of governance indicators, the interaction term has a negative and statistically significant effect at the 1% level depending on whether we control for government effectiveness, the rule of law or the control of corruption. In this respect, improved governance strengthens the potential of local governments to implement distributive policies and to improve the welfare of citizens in their jurisdictions.

Table 2: Combined effect of political decentralisation and governance indicator on the Gini coefficient befor transfer

VARIABLES	(1) FGLS	(2) FGLS	(3) FGLS
POLAUTO	-0.1695	-0.2700*	-0.1886
	(0.1393)	(0.1441)	(0.1577)
POPRATE	1.6868***	1.8234***	2.0201***
	(0.2978)	(0.3125)	(0.3111)
GOVEXP	-0.0633**	-0.0360	-0.0575*
	(0.0315)	(0.0320)	(0.0314)
TRADOP	-2.8238***	-2.7384***	-2.9555***
	(0.4267)	(0.4269)	(0.4196)
GDPPC	47.4781***	38.1615***	43.2254***
	(5.2222)	(5.1840)	(5.0414)
GDPPC2	-2.5515***	-2.0577***	-2.3578***
	(0.2843)	(0.2809)	(0.2723)
QBUR	3.4161***		
	(0.5161)		
Rule of law		2.7474***	
		(0.4773)	

CORR			3.0870***
			(0.3800)
DEC*GOV	-1.9716***	-1.1501***	-0.5996**
	(0.2496)	(0.2336)	(0.2601)
Constant	-162.4524***	-119.4773***	-139.4624***
	(24.2781)	(24.3006)	(23.6949)
Observations	589	589	589
Number of countries	35	35	35

statistical significaticance at 1%, ** statistical significaticance at 5% and * statistical significaticance at 10%.

3.3. Robustness checks

Three robustness analyses are conducted. The first analysis takes into account the income inequality after transfer, the second the Palma ratio as an alternative measure of inequality, and the third introduces the IV method to correct possible endogeneity problems.

3.3.2. Gini after transfer

Gini after transfer is disposable income, in turn, is gross income minus direct taxes. According to Solt (2020) it refer to « post-tax, post-transfer » income. The table 3 below shows that political autonomy of decentralized units directly affect negatively and significantly the Gini after transfer in the specification where we control corruption control. The mediating term also shows that, combine political decentralization with good governance lead to the reduction of income inequality after that household have received various transfers. In fact all coefficient associated to the mediating term are all significant in 1% level and négatively correlated with the Gini after transfer.

Table 3: Combined effect of political decentralisation and governance indicator on the Gini coefficient after transfer

VARIABLES	(1) FGLS	(2) FGLS	(3) FGLS
POLAUTO	0.0706	-0.0434	-0.2772*
	(0.1324)	(0.1382)	(0.1522)
POPRATE	1.6837***	1.7074***	1.6636***
	(0.2842)	(0.3012)	(0.3019)
GOVEXP	-0.2570***	-0.2243***	-0.2415***
	(0.0300)	(0.0307)	(0.0304)
TRADOP	-1.7351***	-1.8126***	-2.1232***
	(0.4044)	(0.4087)	(0.4045)
GDPPC	72.0957***	61.5068***	68.3854***
	(4.9907)	(4.9978)	(4.8979)
GDPPC2	-3.8624***	-3.3027***	-3.6849***
	(0.2716)	(0.2708)	(0.2645)
QBUR	1.9305***		
	(0.4876)		
Rule of law		1.0474**	
		(0.4583)	
CORR			1.7918***
			(0.3659)
DEC*GOV	-2.0164***	-1.0389***	-1.3519***

	(0.2381)	(0.2250)	(0.2524)
Constant	-280.9432***	-231.3479***	-260.2132***
	(23.1932)	(23.4190)	(23.0130)
Observations	593	593	593
Number of countries	35	35	35

statistical significaticance at 1%, ** statistical significaticance at 5% and * statistical significaticance at 10%.

3.3.2. The Palma ratio

Alternatively, we adopt the Palma ratio described in section 2 as a measure of income inequality. The results presented in Table 3 below indicate that, in terms of the magnitude of the effect, a unit increase in the political autonomy of decentralized authorities induces a reduction in the gap between the richest 10% and the poorest 40% for -0.13 and -0.12 when we control the quality of bureaucracy and the rule of law. As for the direct effect of governance, only the rule of law affects the dependent variable. The positive and significant effect of the interaction term on the third case (table 3 column 3) suggests that political autonomy combined with uncontrolled corruption negate the benefits of decentralization in reducing the income gap between rich and poor.

Table 4: Combined effect of political decentralization and governance indicators on the Palma ratio

	(1)	(2)	(3)
VARIABLES	FGLS	FGLS	FGLS
POLAUTO	-0.0810***	-0.0818***	-0.0321
	(0.0290)	(0.0294)	(0.0341)
POPRATE	0.6214***	0.6195***	0.7173***
	(0.0747)	(0.0752)	(0.0785)
GOVEXP	-0.0231***	-0.0227***	-0.0241***
	(0.0067)	(0.0066)	(0.0066)
TRADOP	-0.4636***	-0.4783***	-0.4756***
	(0.0913)	(0.0889)	(0.0883)
GDPPC	12.0749***	12.0591***	12.8536***
	(1.1915)	(1.1852)	(1.1371)
GDPPC2	-0.6422***	-0.6414***	-0.6907***
	(0.0656)	(0.0648)	(0.0620)
QBUR	-0.1533		
	(0.1147)		
Rule of law		-0.1812*	
		(0.0994)	
CORR			-0.1273
			(0.0810)
DEC*GOV	-0.0009	0.0214	0.1710***
	(0.0568)	(0.0492)	(0.0573)
Constant	-52.0850***	-51.9720***	-55.1983***
	(5.4603)	(5.4876)	(5.2914)
Observations	496	496	496
Number of countries	33	33	33

statistical significaticance at 1%, ** statistical significaticance at 5% and * statistical significaticance

at 10%.

3.3.2. Endogeneity concern

It is possible to consider endogeneity problems from equation (1). We follow the approach of Digdowiseiso et al, (2022) and adopt as instruments : political decentralization, the various indicators of governance, and the interaction term lagged by one period. The model is estimated by the SGMM in a two-step.

Table 5: Combined effect of political decentralization and governance indicators on the Gini coefficient

VARIABLES	(1) SGMM	(2) SGMM	(3) SGMM
Gini (t-1)	0.9539***	0.9770***	0.9756***
	(0.0105)	(0.0120)	(0.0129)
POLAUTO	-0.1596***	-0.1230**	-0.1682***
	(0.0352)	(0.0560)	(0.0318)
POPRATE	-0.0062	-0.0074	0.0152*
	(0.0106)	(0.0080)	(0.0088)
GOVEXP	-0.0075*	-0.0023	-0.0107***
	(0.0044)	(0.0062)	(0.0039)
TRADOP	-0.2671***	-0.2085**	-0.2383***
	(0.0628)	(0.0941)	(0.0709)
GDPPC	-0.3031	-1.0683	-0.2524
	(1.0101)	(0.9944)	(0.7116)
GDPPC2	0.0239	0.0613	0.0203
	(0.0554)	(0.0521)	(0.0393)
QBUR	-0.2050**		
	(0.0843)		
Rule of law		-0.1065**	
		(0.0512)	
CORR			-0.0741
			(0.0807)
DEC*GOV	0.0198	0.0054	-0.2073***
	(0.0707)	(0.0410)	(0.0496)
Constant	4.1730	6.6053	2.9782
	(4.2641)	(4.1989)	(3.1138)
Observations	592	570	592
AR1	0.024	0.028	0.019
AR2	0.612	0.565	0.505
Hansen test	0.352	0.396	0.822
Number of instruments	28	30	30
Number of countries	35	35	35

statistical significaticance at 1%, ** statistical significaticance at 5% and * statistical significaticance at 10%.

The different econometric estimations show that the estimated model is globally valid. First, Hansen's tests indicate that the internal instruments used are globally satisfactory (p-value ≥0.10 for all estimates). Thus, the number of instruments used is appropriate (absence of instrument proliferation). Secondly, the first-order autocorrelation test (p-value <0.10 for all specifications) and the second-order Arellano and Bond test (p-value ≥ 0.10 for all estimates) do not reject the hypotheses of the presence of an AR1 effect and the absence of an AR2 effect respectively.

Moreover, the autoregressive terms are globally positive and significant at the 1% level, which justifies the use of a dynamic model.

Turning to estimation results in table 4, political decentralization affects negatively and significantly at the 5% level of the Gini coefficient in all cases. Taking into account the mediating effect of governance indicators in explaining the relationship between political decentralization and income inequality, the interaction term is significant and has a negative effect on the Gini coefficient in the specification where corruption is controlling.

Thus the robustness of our analysis by solving the endogeneity problems tends to confirm that political decentralization tends to be effective in reducing income inequality in developing countries as the control of corruption improves.

3.4. Summary of results and discussion

The lessons learned from this analysis are :

First, considering the direct relationship of political decentralization on income inequality in developing countries, it appears that the effect of political autonomy of local governments is statistically significant. This means that, the proximity induced by the decentralization increases citizen participation and in turn the accountability of local policy makers. Citizens are inclined to participate in political life, forcing local decision-makers to pursue policies that have greater impact on their lives. Thus, political decentralization can be an effective tool to affect income redistribution policy in developing countries. This result seems to explain the position of the second generation theory of fiscal federalism. Which recognizes the important role of decentralized units in the implementation of redistributive policies (Bahl and al. 2002 ; Barr, 2004). It in contradiction with Morelli and Seaman (2007), who suggesting that "many of the influences on inequality lie beyond the powers of the decentralized institutions themselves".

Second, we have shown that maintaining a good governance has a positive effect on the effectiveness of political autonomy of subnational governments, in reducing income inequality among individuals in a country. Mainly by fighting effectively against corruption. This result does not call into question those of Digdowiseiso et al (2022), Sepulveda and Martinez-Vazquez (2011) and Enikolopov and Zhuravskaya (2007). It also confirms the idea of Rodriguez-Pose and Ezcurra (2010).

Conclusion

In this study, we take a new approach to the relationship between decentralization and income inequality. We examine the mediating effect of the quality of institutions through how the public authority is exercised (governance) to explain the relationship between political decentralization and income inequality in 39 developing countries over the period 1990-2017. From a development perspective, the relationship between political decentralization and governance may be important for reducing income inequality in developing countries. We mainly capture political decentralization by the political autonomy of decentralized units, use the Gini coefficient as the main measure of income inequality, and adopt three governance indicators from Kaufman and Kraay (2017). Our study is, to our knowledge, unique it considers the quality of governance, and involves the concepts of efficiency or quality of bureaucracy, rule of law, and control of corruption.

The main conclusion of the empirical review is that the different governance contexts of decentralization in developing countries can affect income redistribution. We find that an improvement in good governance positively affects the ability of decentralization to reduce income inequality in developing countries. Consequently, the most important governance

characteristics for the political decentralization-income inequality relationship are those captured by the control of corruption.

Our results have important implications for economic policy in developing countries. Decentralization can be an effective tool for citizens to obtain better redistributive policies in a good governance situation. Sub-national governments in developing countries, by independently implementing their redistribution policies, can improve income redistribution if they achieve an optimal level of good governance by fighting against corruption.

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Appendix 1 countries sample

Argentina ; Bangladesh ; Barbados ; Bhutan ; Bolivia ; Brazil ; Cambodia ; chile ; Colombia ; Costa Rica ; Dominican Republic ; Ecuador ; El Salvador ; Guatemala ; Guyana ; Haiti ; Honduras ; India ; Indonésia ; Israel ; Jamaica ; Malaysia ; Mongolia ; Nicaragua ; Panama ; Paraguay ; Peru ; Philippines ; Singapore ; South Korea ; Sri Lanka ; Suriname ; Thailand ; Trinidad and Tobago ; Turkey ; Urugay ; Venezuela ; Vietnam ; China

Appendix 2 : descriptions variable and descriptive statistic

Table 6: Variable descriptions and sources

Variables	Descriptions	sources
POLDEC	Political decentralization (political autonomy of decentralised authorities score varies between 0 and 10. A high score represents a high level of political autonomy)	Regional Authority Index (RAI) dataset
Gini	varying between 0 and 100 a high value means a high level of income inequality	Standard World Income Inequality Database (SWIID)
Ratio Palma	ratio between the share of the richest 10% and the poorest 40%	World Income inequality Database (WIID)
QBUR	Quality of bureaucracy ranges from -2.5 to 2.5. A high score represents a high level	World Governance Indicators (WGI)
Ruloflaw	Rule of law ranges from -2.5 to 2.5. A high score represents a high level	World Governance Indicators (WGI)
Corr	control ranges from -2.5 to 2.5. A high score represents a high level	World Governance Indicators (WGI)
POPRATE	Population growth rate	World Development Indicators (WDI)
GOVEXPEND	Size of government (total public expenditure % GDP)	World Development Indicators (WDI)
TRADOP	Trade openness (sum of imports and exports as % GDP)	World Development Indicators (WDI)
GDPPC	Gross domestic product per capita in purchasing power parity	World Development Indicators (WDI)
GDPPC2	Gross domestic product per capita in purchasing power parity squared	World Development Indicators (WDI)

Table 7 : descriptive statistics

variables	Obs	Mean	Std.Dev.	Min	Max
Political autonomy	1090	.5741589	1.115507	0	5.48233
Bureaucracy quality	852	-.0239802	.7387982	-2.078492	2.436975
Rule of law	852	-.1980458	.746254	-2.255286	1.825243
Corruption control	852	-.1668956	.8093330	-1.722249	2.32558
Gini coefficient	986	43.56978	5.762351	29.3	54.7
Population rate	1092	1.39356	.7371352	-1.514766	6.017009
Government size	773	19.49703	7.386402	5.560821	65.22712
Trade openess	1,024	4.213306	.5958743	2.621261	6.08068
LogGDPPC	1,056	9.108473	.7853659	7.013166	11.46531
LogGDPPC2	1,056	83.5805	14.34337	49.1845	131.4534