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Does decentralization increase access to poverty-related services? Evidence from Benin

Abstract

In this paper, we analyze the average and distributional effects of decentralization on the access to some poverty-related public services in Benin. Analyzing panel data from local governments, called *communes*, for 2006 and 2007 our study suggests that decentralization has a positive overall effect on access to basic services. However, this effect appears to be non-monotone following an inverted U-shaped curve. Moreover, it varies according to *communes*' wealth: it is positive for sufficiently wealthy *communes* and may be negative for the poorest ones. We also highlight that decentralization may increase intra-jurisdictional inequalities especially within the poorest areas. Decentralization in Benin contributes successfully to the reduction of poverty by improving the average access to poverty-related services. However the devil is in the details as decentralization seems to increase inequality in terms of access within and between *communes*.

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1 Introduction

Over the past two decades, decentralization has been implemented by many developing countries, becoming a key element of the public-sector reform. By bringing decision-makers closer to citizens, decentralization is expected to alleviate information asymmetries, to improve accountability, and to increase the efficiency of public goods provision. In developing countries, decentralization is one of the main institutional reforms on international organizations and donors' agenda to enhance public governance and ultimately to reduce poverty. This strategy has been in place for a number of years and now seems an appropriate time to examine the extent to which this institutional transformation has been successful to fight poverty in sub-Saharan Africa.

With this objective in mind, this paper analyzes the effect of decentralization in Benin on access to some poverty-related services, namely water, sanitation, refuse and sewage disposal, and primary education. Poverty is a multidimensional issue and basic health and education services are fundamental human rights.[1] Decentralization is by definition a transfer of competencies to local governments, mostly in the education and health sectors. These services do not exactly correspond to the Samuelsonian definition of pure public good (non-excludability and non-rivalry). However, local and central governments share the responsibility for meeting fundamental rights in education and health. Whatever the means of producing such basic services and the nature of relationships with providers, local decision-makers remain, in the last resort, politically responsible (World-Bank, 2004) for achieving improvements in access to drinking water, sanitation, and primary education. In a sense, our argument rests on how decentralization facilitates access to high quality services rather than on an investigation of how well publicly provided local goods are delivered.

In regard to its democratization and decentralization processes, Benin is representative of the African French-speaking countries (20 countries and around 243 million inhabitants in 2009). An ethnically fragmented country that has been politically stable only since 2001, Benin began a transfer of competencies or authority to 77 local governments, called *communes*, in 1998. The decentralization process definitively took off with municipal elections in 2002. Our analysis focuses on the 2006-2007 period, which corresponds to a crucial time for

[1] Articles 25 and 26 of the Universal Declaration of Human Rights.

democracy in Benin, with the 2006 national elections bringing Yayi Boni to power in place of Mathieu Kerekou, who had ruled the country for 29 years.

By analyzing panel data from 77 Beninese communes for 2006 and 2007, we aim to shed light on the three following issues: (1) To what extent does decentralization, measured as the share of local own revenue in total local revenue for each commune, affect access to basic public services? Is this effect monotone with the degree of decentralization? (2) Does the decentralization effect vary between communes according to their wealth? (3) How does decentralization affect households' equality of access to poverty-related services within communes? To answer these questions, we use original micro-level public finance panel data from a sub-Saharan country. In addition to local public finance data, we use the 2006 and 2007 Integrated Modular Survey on Household Living Conditions (EMICoV), which covers a sample of 18,000 Beninese households throughout the entire national territory and is representative at the commune level, allowing us to measure aggregated and distributional indicators. Moreover, we employ a consistent econometric method taking into account potential endogeneity in the degree of decentralization, heterogeneity of local governments, and inefficiency in estimating the effect of variables having little within variance.

Our analysis suggests that, on average, decentralization positively affects access to basic public services. However, not only is this effect non-monotone, following an inverted U-shaped curve, but between and within effects reveal heterogeneous effects on communes. Decentralization's effect on access to poverty-related services is positive for sufficiently wealthy *communes* (measured by the top quintile of private consumption) and becomes negative for the poorest ones. We emphasize that decentralization may also increase households' inequalities (measured in terms of public services access), especially within the poorest jurisdictions. Therefore, although decentralization succeeds in reducing nonmonetary poverty in Benin by improving access to some basic services, the pitfall of higher inequalities between and within communes remains.

The paper is structured as follows. Section 2 presents a review of the literature on the impact of decentralization on service delivery and human development indicators in developing countries. Section 3 portrays the process of decentralization in Benin. Section 4 describes our econometric framework. Section 5 presents the average and distributional

impact results. Section 6 concludes.

2 The impact of decentralization on services delivery and human development indicators: A review of the literature

A huge literature in economics has focused on decentralization in developing countries. A brief review of this literature addresses the strengths and weaknesses of such a strategy to reduce poverty, or at least to increase the efficiency of public goods provision. Many benefits of decentralization are claimed in the fiscal federalism literature, most of them related to the fact that decentralization brings decisions closer to citizens, alleviating information asymmetries and improving local governments' accountability. The fiscal federalism literature has largely stressed the economic efficiency of intergovernmental competition for providing local public goods. If such a normative prescription seems to fit well with developed countries, this issue remains more complex for developing countries where the 'voting by feet' mechanism is not so relevant. Thus, the logic of decentralization raises some intriguing issues in developing countries that we can summarize around two perspectives: (a) Why does decentralization entail a better provision of local public goods? (b) What are the limits of decentralization in such countries given their institutional and geographical constraints? In addition to these issues, our paper emphasizes some benefits of decentralization related to the positive influence of institutions on poverty reduction in French-speaking African countries.[2]

A demand-side argument in favor of decentralization is derived from the existence of information asymmetries. Indeed, the seminal idea that decentralization may improve the provision of public services when local governments have an informational advantage goes back at least as far as Hayek (1948) and Oates (1972). Since local decision-makers have a better knowledge of local preferences, decentralization is expected to improve the level and quality of public services. This informational gain may induce a better targeting of the poorest populations in a country (see for instance Alderman (2002) in Albania, Bardhan and Mookherjee (2005) in West Bengal or Galasso and Ravallion (2005) in Bangladesh).

[2] An important literature has been devoted to analyzing the benefits of decentralization on human development indicators in the context of the Millennium Objectives. The final impact of decentralization on growth has been studied, for instance, by Zhang and fu Zou (1998), Wollera and Phillips (1998), Davoodi, Xie, and Zou (1999), Lin and Liu (2000), Akai and Sakata (2002), and Martinez-Vazquez and McNab (2003)...

On the supply side, decentralization should enhance the accountability of policymakers. Decentralization allows for a better provision of public goods and a better matching between public policies and local needs. Several authors established such a link: Bird and Rodriguez (1999) in the Philippines (health, primary education, housing, and infrastructure), Faguet (2004) in Bolivia (education and social services), Galiani, Gertler, and Schargrodsky (2008) in Argentina (education), Robalino, Picazo, and Voetberg (2001) on a panel of low and high income countries from 1970 to 1995 (mortality rate), Enikolopov and Zhuravskaya (2007) on 75 developing and transition countries for 25 years (DPT immunization[3], infant mortality, illiteracy rate, and pupil-to-teacher ratio). Other studies mitigated the impact of decentralization. For instance, Azfar and Livingston (2010) find little evidence of better provision of government services by local governments in Uganda; for Winkler and Rounds (1996), the transfer of education competencies in Chile reduced the scores of cognitive tests.

Beyond improving the matching of public policies with local preferences, decentralization is also considered as an essential support of democratization. Thus the governance of local public goods is expected to strengthen accountability under the strong assumption of well-informed voters, mobility of citizens, and participation into the political market Seabright (1996) compares allocations of power to local and central governments as alternative means of motivating governments to act in the interests of citizens, and shows that although centralization entails benefits from policy coordination, it also induces some costs in terms of diminishing accountability. Conversely, interjurisdictional competition may enhance accountability: local citizens encourage incumbents to increase the efficiency of public spending through a 'vote with feet' (Tiebout, 1956) or a 'yardstick competition' (Salmon, 1987, Besley and Case, 1995).[4] Few studies have examined the relevance of this phenomenon in developing countries: Arze, Martinez-Vasquez, and Puwanti (2008) suggest the existence of yardstick competition between local governments in Indonesia; Caldeira, Foucault, and Rota-Graziosi (2008) establish the existence of strategic interactions between Beninese *communes* whose

[3] Diphtheria, Pertussis and Tetanus.

[4] Citizens can vote with their feet, that is, move to a nearby jurisdiction to obtain the public service-tax package they prefer so that local governments compete to attract people and increase their tax bases. Even in the absence of population mobility, in the context of informational asymmetries between voters and politicians, voters can use the performance cues of other governments as a benchmark to judge whether their representative wastes resources and deserves to remain in office. Thus, an action chosen by a politician in one jurisdiction affects the informational set of imperfectly informed voters in other jurisdictions forcing neighboring politicians to compete in order not to be signaled as bad incumbents and to remain in office.

public spending appear as strategic complements.

By expanding the decision space of local governments, decentralization may increase corruption. Bardhan and Mookherjee (2000) point out the theoretical ambiguity of the importance of relative capture at the local and national levels. Huther and Shah (1998), Barenstein and de Mello (2001), and Fisman and Gatti (2002) find a negative relationship between fiscal decentralization and corruption for several panels of countries.[5] In contrast, Reinikka and Svensson (2004) highlight the capture of school grants by local officials in Uganda. At the macroeconomic level, Treisman (2000) and Fan, Lin, and Treisman (2009) conclude that federal states are more corrupt. Using data on 154 countries, Treisman (2000) also suggests that more tiers of government induce higher perceived corruption, less effective provision of public health services, and lower adult literacy, especially in developing countries. Prud'homme (1995) stresses several additional pitfalls of decentralization in developing countries, namely the increase in interjurisdictional disparities, the jeopardizing of macroeconomic stability, the ethnical bias of local elections, and low capacities of local bureaucracies.

Another supply-side argument against decentralization concerns the risk of diseconomies of scale or at least a loss of scale economies. However, many of the public goods in question are community- and site-specific, and it is often possible to exclude nonresidents. Rural communities of poor countries, in particular, are often face-to-face, and social norms sharply distinguish "outsiders" from "insiders," especially with respect to entitlement to community services (Bardhan, 2002).

Finally, decentralization is generally viewed as a trade-off between autonomy and accountability, between costs of coordination and better provision of public goods, and between preference matching and externalities. Besley and Coate (2003) and Lockwood (2002) confirm Oates' insights by showing that the relative performance of centralized and decentralized provision of public goods depends upon spillovers and differences in tastes for public spending between jurisdictions.[6]

To our knowledge, no attention has been paid to the consequences of decentralization

[5] Fisman and Gatti (2002) use legal origin as an instrument for decentralization.

[6] Competition among jurisdictions to attract mobile capital is a way to discipline governments, motivating them to invest more in infrastructure, reduce waste and corruption, and spend less on non-productive public goods. But, Cai and Treisman (2005) emphasize that the required assumptions (perfect mobility, perfect local autonomy...) are often unrealistic, and capital mobility may even weaken discipline of the poorly-endowed units.

on well-being conditions in French-speaking African countries. Our paper fills this gap by focusing on Benin where micro-data (households) and macro-data (local public finance) have been combined for the first time.

3 An overview of Benin and its decentralization process

In regard to democratization and decentralization processes in Benin, the country is well representative of French-speaking African countries (20 countries and around 243 million inhabitants in 2009). Benin belongs to the lower income group of countries with an estimated per capita income of US$740 in 2011 and a ranking of 134th out of 169 countries in the Human Development Index (2010). With 8.93 million inhabitants in 2009, the population is distributed among 42 different ethnic groups, the most prominent being the Fon and the Adjas in the South, the Baribas and the Sombas in the North, and the Yorubas in the Southeast.

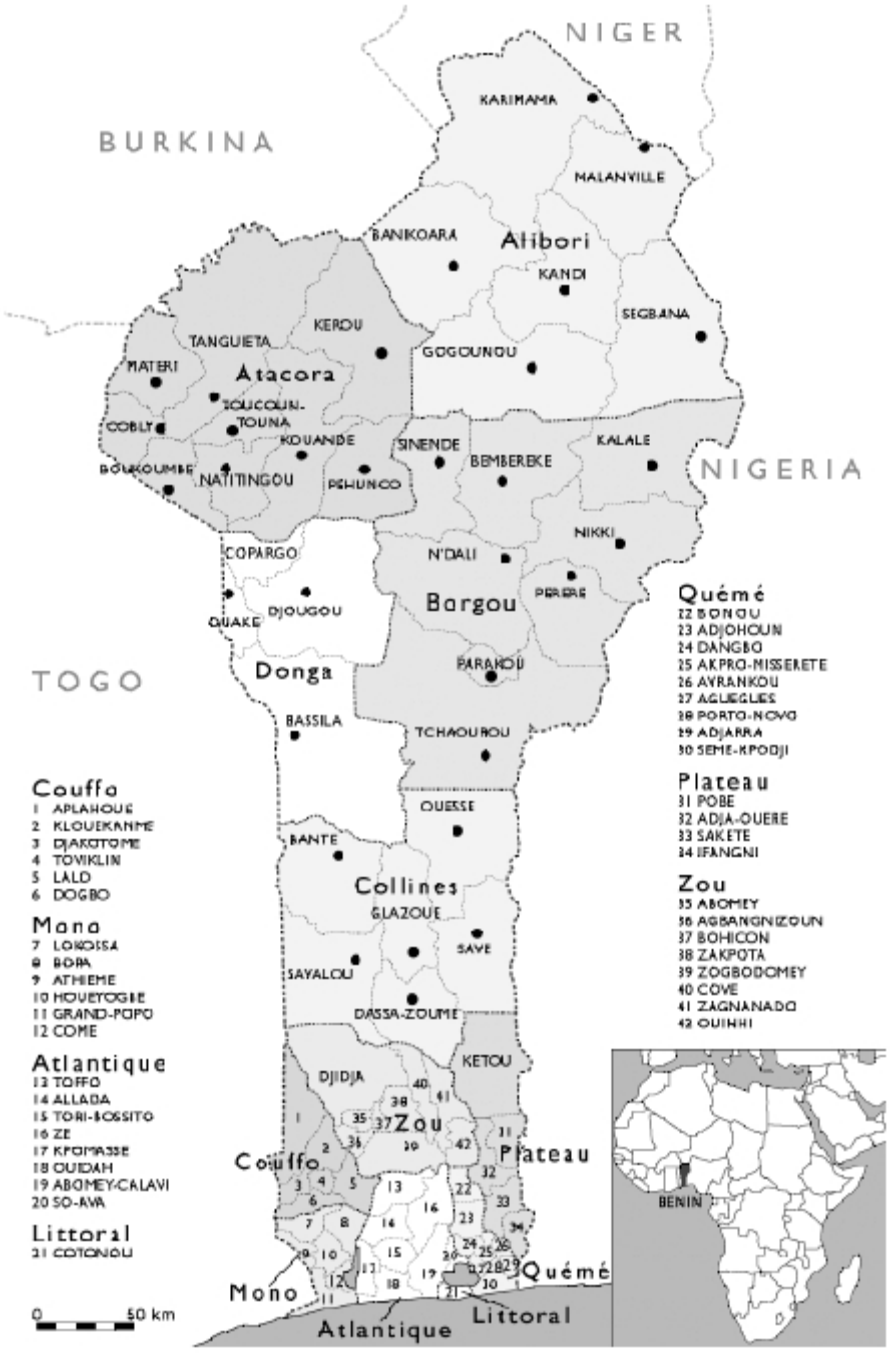
Since its independence on August l, 1960, Benin has had quite a chaotic political history. A succession of military governments ended in 1972 with the last military coup led by Mathieu Kerekou and the establishment of a government based on Marxist-Leninist principles. A move to democracy began in 1989. Two years later, as a result of free elections, the former Prime Minister, Nicephore Soglo, became president. Kerekou regained power in 1996 with some electoral fraud. With the political support of the North of the country (Alibori, Atacora, Borgou, and Donga), he won subsequent elections in 2001. Having served two terms and being over 70 years old, he was ineligible to run in the presidential elections of 2006. He was succeeded by Thomas Yayi Boni, an independent political outsider. In March 2007, President Yayi Boni strengthened his position after the legislative elections in which his coalition, 'Force Cauris pour un Bénin Emergent' (FCBE), won the largest number of seats (35 out of 83) and negotiated a pro-government majoritarian coalition in Parliament with seven minor parties. He was reelected in 2011 with the strong support of the South of the country (Atlantic, Collines, and Mono).

The decentralization process in Benin began in 1998 through the transfer of several competencies to local Beninese jurisdictions, called *communes*. While an elected local gov-

ernment manages the *communes*, a representative of the central government is in charge of the *départements*. Local elections were held in 2002 and 2007. Benin has 77 *communes* in 12 *départements*.[7] As in many French-speaking African countries,[8] the territorial shape of Beninese *communes* results from colonial history and not from any economic consideration with regard to efficiency in public goods provision (see Map 1). For instance, Tanguieta stretches out across more than 5,460 square kilometers for a population of 62,321 inhabitants in 2008 (11.4 inhabitants per square kilometer), while Akro-Missérété contains 98,961 inhabitants on only 79 square kilometers (1,252 inhabitants per square kilometer).

[7] *Communes* are themselves divided into 546 districts.

[8] Burkina Faso counts 351 *communes* for 16.2 million inhabitants, while Mali has 703 *communes* for 15 million inhabitants.



Map 1: Administrative map of Benin

In January 1999, Law 97-029 defined the competencies being transferred from the central government to the 77 communes. Their scope was large, ranging from elementary school to economic development and including transport infrastructure, environment, health, social

goods, tourism, security, and cultural activities. We may distinguish four kinds of competencies: exclusive local competencies, shared competencies, delegated competencies, and specific competencies. For delegated competencies, local jurisdictions act as a representative of the central state. Specific competencies concern some *communes* that have a particular status (Cotonou, Porto-Novo, and Parakou). Table 1 summarizes these competencies.

Table 1: Beninese *communes'* competencies

Type of competencies
Exclusive local competencies
Transport infrastructure: maintenance of local roads, public lightings.
Shared competencies
Hygiene conditions: sewage and refuse disposal (latrines, septic tanks...), drinking water.
Education: construction and maintenance of public primary schools, adult literacy, cultural public infrastructures, sports, and leisure.
Delegated competencies
Public records office, security, publication and application of laws.
Specific competencies
Secondary schools, security, communication.

Source: Law $N°97-029$ of Benin Republic, January 15^{th}, 1999.

The distinction between shared and exclusive local competencies is largely subjective, linked to our interpretation of the relevant law and of observed practices in this country. First, the transfer of competencies is obviously progressive and may take some time. For instance, the effective role of *communes* in water and sanitation is limited. The SONEB (Société Nationale des Eaux du Bénin) is a public enterprise still in charge of drinking water supply and sewage disposal in urban areas. A deconcentrated service, the General Direction of Water, remains essential in rural areas. Secondly, some competencies, such as primary education, require some technical and financial support from the central government.

Usually, a transfer of competencies implies a transfer of fiscal resources. Table 2 presents Beninese *communes'* revenue distinguishing local own-revenue, (tax and non-tax) and other local revenue (central conditional and unconditional grants, external transfers, and, loans and

advances) over the period 2006-2007. A local representative of the central tax administration (*Directions Départementales des Impôts*) collects local taxes, mainly property and patent taxes.[9] By contrast, local governments support collection costs of non-tax own-revenue, essentially revenue related to occupations in the public domain (market stalls, parking tolls, kiosks, hoardings...) and to some administrative services. Central conditional grants represent about 25 percent of local revenue with some huge disparities: less than 3 percent for Atlantic and more than 30 percent for Oueme. Unconditional transfer is another source of Beninese *communes*' revenue. It corresponds to a retroceded tax, the road tax, collected by customs on exports (0.85 percent of the value of exported goods).[10] Generated revenue is shared among *communes* following a fixed rule: 80 percent is allocated to three 'special' *communes* (Cotonou, 60 percent; Porto-Novo, 24 percent; and Parakou, 16 percent); the rest is distributed among the 74 other *communes* according to their respective demographic weight.

Table 2: Average composition of Beninese *communes* per capita revenue (FCFA)

	Average level per capita	Percentage of total resources
Total local revenue	2175	100
Own-revenue	**1137**	**52**
Local non-tax own-revenue	623	29
Local tax own-revenue	514	23
Other local revenue	**1038**	**48**
Unconditional central grants	225	11
Conditional central grants	571	26
External transfers	225	10
Loans and advances	17	1

Source: Beninese Ministry of Finance and Economy.

Beninese *communes* are characterized by a low average level of per capita revenue with

[9] Beninese local governments can also tax mining, advertisements, and taxi drivers, and they have the opportunity to collect a tax on local development (see Chambas, 2010 for a detailed analysis of local fiscal resources in sub-Saharan Africa, in particular in Benin).

[10] The authorities abolished this tax in 2009 for transit goods being exported to landlocked countries such as Niger and Burkina Faso.

about 2200 FCFA (US $4.7). Moreover, important inequalities exist among communes: the revenue per capita of the twenty poorest communes represents only 50 per cent of the revenue of the five richest ones. Local governments' revenues also differ in their composition. For instance, Parakou and Porto-Novo, despite having a similar per capita revenue (6500 FCFA), have 50 and 35 percent of local own-revenue, respectively.

4 Econometric framework

In this section, we present our empirical strategy. We first test the average effect of decentralization on access to poverty-related services. We then assess its distributional effect between and within jurisdictions by distinguishing *communes* according to their wealth and by considering Gini coefficients of services access in the *communes*.

4.1 Data and empirical models

We use several sources of information. The Beninese Ministry of Finances and Economy provided us with the *communes*' budget. The 2006 and 2007 Integrated Modular Surveys on Household Living Conditions (EMICoV) contain information concerning individual education level, household consumption and wealth, and access to several local public goods. They cover a sample of 18,000 Beninese households across the entire national territory. The sample includes 7,440 urban households and 10,560 rural households.[11] The main originality of these surveys lies in their representative character at the *commune* level, allowing us to measure aggregated and distributional indicators at the study level as described below. Data concerning population, urbanization rate, and ethnic fragmentation are drawn from *General Population and Housing Census* in Benin (1992 and 2002) and 77 *communes*' monographs provided by the European Union (*Programme d'Appui au Démarrage des Communes*).

4.1.1 Testing the average effect of decentralization on access to basic services

Our empirical analysis focuses on universal basic needs, setting aside any normative considerations in terms of welfare. It appears more relevant to study actual access to public

[11] This sample is a stratified sample selected in two stages: stratification was achieved by separating every *commune* into urban and rural areas.

services than ultimate effects on individual well-being, which may depend on many factors outside local governments' control. We consider several basic services: toilet facilities, water access, refuse and sewage disposal, and primary education. Table 3 gives the detailed list of indicators, denoted by Y_{it}, for each kind of service.

Table 3: Indicators of basic services access

Basic services, Y_{it}	Indicators
Toilet facilities	
	- Share of households having access to a toilet or latrine facility, $STOil_{it}$.
	- Type of toilet facility (no facility, bucket/pan, latrine with composting, suspension latrine, non-flagged pit latrine, non-ventilated pit latrine, ventilated pit latrine, own flush toilet, flush toilet), $TToil_{it}$.
Water access	
	- Share of households having access to drinking water, $SWat_{it}$.
	- Source of drinking water (rainwater, rainwater in tanker truck, river, pond, protected spring, non-protected well, protected well, borehole with manual pump, borehole with automotic pump, public tap, piped somewhere, piped into residence), $TWat_{it}$.
Refuse disposal	
	- Share of households having access to refuse disposal facilities, $SGarb_{it}$.
	-Type of refuse disposal (nature, courtyard, burning, burying, rubbish dump, collection truck (NGO), collection truck (public)), $TGarb_{it}$.
Sewage disposal	
	- Share of households having access to sewage disposal facilities, $SSew_{it}$.
	- Type of sewage disposal (nature, courtyard, well, grid/downstream, open pipe waste, covered pipe waste, draining), $TSew_{it}$.
Primary education	
	- Primary school enrollment for children aged 6 to 11, SE_{it}.

Source: EMICoV surveys, 2006 and 2007.

These indicators are all measured from the EMICoV surveys at the household level except for education indicators, which require individual data. To assess public services access we use two indicators: the first measures the share of households or individuals having access to the service (*quantity*); and the second reflects the qualitative scale of the provided service (*quality).* The last variable uses all available information, allowing us to better understand the effect of decentralization.

To better understand how quantitative and qualitative variables have been computed,

let us describe the indicator of toilet facilities. The EMICoV survey provides the share of households having access to a toilet. On average, 23.7 percent of Beninese households have a toilet facility (Table 4). The quality of the toilet measured by the scale in Table 3 takes the value 1 for no facility to 9 for flush toilet. Using responses from EMICoV respondents, we compute an average index at the *commune* level which indicates that households in only one *commune* have no toilet facilities and ten percent of people have at least a non-flagged pit latrine. The same procedure applies for the four other indicators. Combining consolidated household data on services access to local public finance therefore offers a new avenue for evaluating the impact of decentralization, which we explore in the Beninese case.

The degree of decentralization, denoted by D_{it}, is the share of local own-revenue in *commune*'s total revenue. This measure is used in the literature as an indicator of financial autonomy and also allows us to approximate the accountability of local governments. Indeed, while central transfers are often opaque to the taxpayers, who are then unable to judge the efficiency of local policies, the link between local taxes and local public services provided is more immediate and may constitute an incentive for local officials to improve their efficiency.

We add several control variables. Time dummies, denoted by t_t, control for omitted explanatory variables that vary over time, but remain constant between *communes,* and can influence the share of local governments' own-revenue. We also control for explanatory variables that may be correlated with the degree of decentralization and that vary across both *communes* and time. Since we consider the effect of local revenues' composition and not the impact of local public spending itself, we introduce *communes'* per capita public spending, denoted by G_{it}. We then are able to see if a higher degree of decentralization affects the efficiency of local policies, given the level of local public spending. This control variable is essential because *communes*' public spending affect the level of received transfers, the measured degree of decentralization, and the access to basic services.[12] For similar reasons we introduce per capita consumption, denoted by C_{it} (measured by an index of about 1,200 commodities and services).[13] Jurisdiction population size (Po_{it}) and population den-

[12] Although the pursuit of an equitable allocation of resources would lead one to expect a pro-poor allocation of transfers across jurisdictions, most empirical studies (Wallis, 1998, Meyer and Naka, 1999 or Alm and Boex, 2002) find that wealthier local governments receive greater intergovernmental transfers, indicating that political considerations outweigh those of equity.

[13] Provided by the EMICOV surveys.

sity (De_{it}) allow us to capture, respectively, over-representation of smaller jurisdictions and some scale economy in the provision of studied public goods. We also consider urbanization rate, denoted by U_{it}, since urban areas generally offer better access to basic services and have higher fiscal capacities, especially in terms of property tax base. Finally, ethnic fragmentation, denoted by F_{it},[14] may be correlated with the degree of decentralization and affects the provision of public goods in quantity and quality (Alesina and Ferrara, 2005).

The following regression assesses the average impact of decentralization on access to basic services:[15]

$$Y_{it} = \beta D_{it} + \theta G_{it} + \gamma C_{it} + \rho Po_{it} + \tau De_{it} + \omega U_{it} + \psi F_{it} + t_t + \varepsilon_{it}, \tag{1}$$

We also consider a non-monotone effect of the degree of decentralization by introducing its quadratic term $\left(D_{it}^2\right)$:

$$Y_{it} = \beta_1 D_{it} + \beta_2 D_{it}^2 + \theta G_{it} + \gamma C_{it} + \rho Po_{it} + \tau De_{it} + \omega U_{it} + \psi F_{it} + t_t + \varepsilon_{it}. \tag{2}$$

4.1.2 A heterogeneous effect between and within *communes*

In addition to the average impact of decentralization on access to public services, we study its effect by distinguishing *communes* by their wealth. This analysis allows us to assess the overall impact of decentralization on inter-*commune* inequalities in terms of access to basic services. We obtain the following regression:

$$\begin{aligned} Y_{it} = \quad & \beta_1 (D_{it} * QP_{it}) + \beta_2 (D_{it} * (1 - QP_{it})) \\ & + \phi QP_{it} + \theta G_{it} + \gamma C_{it} + \rho Po_{it} + \tau De_{it} + \omega U_{it} + \psi F_{it} + t_t + \varepsilon_{it}, \end{aligned} \tag{3}$$

where QP_{it} is a dummy variable taking value 1 if the *commune* i belongs to the first quintile of poor *communes*. Following Filmer and Pritchett (2001) we define an asset-based measure of wealth, denoted by W_{it}, for each *commune* using the EMICoV.[16] This measure is based

[14] Ethnic fragmentation in *commune* i on year t is defined as the probability that two individuals randomly drawn from the *commune* are from different ethnic groups.

[15] Population, per capita public spending and per capita consumption are in logarithmic terms.

[16] Due to the abundance of household survey data on asset ownership and the considerable bias measurement error associated with reported income or consumption, a substantial body of literature has developed an asset-based measure of wealth. Filmer and Pritchett (2001) concluded that the DHS wealth index actually

on the Demographic and Health Survey (DHS) wealth index, which states each household's position on an index of asset wealth at national level using Principal Components Analysis (PCA) weights.[17] However, the DHS index underestimates the wealth of rural areas since urban populations own many valuable assets. Following Rutstein (2008), we compute a national-level composite index from wealth indexes that have been separately constructed for urban and rural areas. We then consider the average score by *communes* and we divide the latter into quintiles to distinguish the poor from the non-poor.

Lastly, we consider the distributional effect of decentralization on access to poverty-related services within *communes* using Gini coefficients. According to the argument of greater accountability and informational advantage of local officials, decentralization should lead to a reduction of intra-jurisdictional disparities in the access to basic services. To test this hypothesis, we consider the following model:

$$GY_{it} = \beta D_{it} + \theta G_{it} + \gamma C_{it} + \varphi GC_{it} + \rho Po_{it} + \tau De_{it} + \omega U_{it} + \psi F_{it} + t_t + \varepsilon_{it}, \qquad (4)$$

where GY_{it} is the Gini coefficient of basic services access in *commune* i on year t.[18] We also add GC_{it}, the Gini coefficient of per capita consumption in *commune* i on year t, to control for private inequalities. Note that we cannot compute Gini coefficients to assess inequalities in access to primary school enrollment. A possible indicator of inequality in individual access to primary education could rely on the gender issue, which is beyond the scope of this analysis.

As for the average effect analysis, we consider the effect of decentralization on inequalities within *communes* according to their wealth. Formally, we test:

$$\begin{aligned} GY_{it} = \quad & \beta_1(D_{it} * QP_{it}) + \beta_2(D_{it} * (1 - QP_{it})) \\ & + \phi QP_{it} + \theta G_{it} + \gamma C_{it} + \varphi GC_{it} + \rho Po_{it} + \tau De_{it} + \omega U_{it} + \psi F_{it} + t_t + \varepsilon_{it}. \end{aligned} \qquad (5)$$

performed better than the traditional consumption or expenditure index in explaining differences in economic status.

[17] The general methodology used to calculate the wealth index is given in Filmer and Pritchett (2001). The specific approach used in the DHS is described in Rutstein and Johnson (2004).

[18] Gini coefficients are measured on the qualitative variables of public services.

4.2 Econometric issues and identification strategy

Given the small number of time-series with respect to cross-sectional observations and the fact that some variables have little within variance, we first estimate pooled OLS regressions with year dummies. This estimation method increases the degree of freedom and allows inquiring into variables that have low variability. However, it assumes that control variables capture all the relevant *communes'* characteristics.

This estimation may be biased by unobserved heterogeneity between *communes*. Our panel data allows controlling for a large number of unobserved explanatory variables by using the fixed-effects (FE) estimator. However, the traditional FE method results from its inefficiency in estimating the effect of variables that have little within variance, a risk worth considering when analyzing two successive years of observations. To assess coefficients of time-invariant variables and to control for *commune* specific effects, we use the Fixed Effects Vector Decomposition estimator (FEVD) developed by Plümper and Troeger (2007).[19] Through a three-step procedure, this estimator allows a decomposition of the unit fixed effect into two parts: an explained part by time-invariant variables and an unexplained part.[20]

To correct for other potential endogeneity bias in the estimation of the causal effect of decentralization on access to basic services, we instrument the degree of decentralization through a dummy variable, denoted by PA_{it}, taking the value 1 if the *commune* i has the same political affiliation as the president in office. This dummy variable differs between 2006 and 2007 since Yayi Boni was elected in April 2006, succeeding Mathieu Kérékou. Partisan affiliation is a good instrument of decentralization in a regression involving access to public services. In the relevant literature a jurisdiction which has greater political support for the central government receives more transfers from the latter (see, Cox, 1986, for a theoretical argument, Case, 2001, for the Albanian case, Miguel and Zaidi, 2003, for the Ghanaian case).

[19] Based on Monte Carlo simulations, Plümper and Troeger (2007) compare the vector decomposition model with the FE model, the random effects (RE) model, pooled OLS, and the Hausman-Taylor procedure and find that, while the FE model does not compute coefficients for the time-invariant variables, the vector decomposition model performs far better than other procedures.

[20] First, the unit fixed effect is estimated by running a fixed effect estimate of the model. Second, the latter is split into its two parts by regressing it on the time-invariant variables of the model. The unexplained part corresponds to the residuals of this equation, $\widehat{h_i}$. Third, the estimation of the full model is implemented by including the time-invariant variables and the unexplained part of the fixed effect vector estimated in the second step.

5 Estimation results

This section presents our empirical results using panel data from 77 Beninese *communes* for 2006 and 2007.

5.1 The average effect of decentralization on access to basic services

As a first step in our statistical analysis, we present some descriptive statistics (Table 4). Figures 1 to 5 confirm our expectation that a higher degree of decentralization is positively correlated to a better access to poverty-related services.[21] However, the most decentralized *communes* are the richest, the most populated, and the most urbanized (Table 5). These variables are also associated with a higher access to basic public services (Table 6). This confirms the important role of our control variables to avoid endogeneity bias.

To test the average effect of decentralization on access to basic services (Equation 1), we first run the pooled OLS regressions with year dummies, introducing our control variables progressively (columns 1 to 7). Considering potential unobserved heterogeneity between *communes*, we then use the FEVD estimator (column 8). Finally, we instrument for the degree of decentralization with the partisan affiliation (PA_{it}) in column 9. Table 7 reports the relevance of our instrument.[22] Moreover, the Sargan over-identifying restriction test[23] indicates that we cannot reject the hypothesis of no correlation between the instrument and the error term in the regression stating that the partisan affiliation variable is a valid instrument. In Tables 8 to 11 we highlight that a higher degree of decentralization is consistently associated with improved water source and sanitation systems access. In Table 8, model 1 indicates that the degree of decentralization is significantly different from zero and could be interpreted as follows: the impact of a 10 percentage points increase in decentralization represents an extra 3.7 percent in people having access to a toilet or latrine facility. In other words, the standard deviation of the degree of decentralization (23.5 %) implies a 8.69 percentage points increase for one-standard-deviation change. When we turn on the quality of basic services, we observe for instance that once controlled for endogeneity bias a 10 percent

[21] The relation is relatively weak for primary school enrollment (Figure 5).

[22] As in most empirical studies, political considerations outweigh those of equity: wealthier, smaller or more ethnically fragmented jurisdictions receive more intergovernmental transfers and are less autonomous.

[23] We use the dummy variable indicating whether a *commune* has the same dominant ethnic affiliation as the president in office as another instrument to compute the Sargan test.

point increase in the share of own resources entails an extra 0.236 point on the quality index of water access in *communes* (model 9, Table 11). However, while the effect of decentralization on access to refuse disposal facilities is less robust (Tables 12 and 13), decentralization is not found to have a significant average effect on access to sewage disposal facilities and *communes*' primary school enrollment (Tables 14 to 16).

In Table 17, we consider a non-monotone effect of the degree of decentralization by introducing its quadratic term (Equation 2). We find a positive coefficient associated to the degree of decentralization and a negative sign for its squared value. The impact of decentralization is then non-monotone: the relationship between decentralization and access to basic services may be described by an inverted U-shaped curve. Even if we cannot calculate the *average* optimal decentralization degree because of a combination of different scaled criteria for basic services, we are able to determine it individually. Defined as the ratio of local own-revenue over total revenue (given by $-\beta_1/\beta_2$, Equation 2), the optimal degree of decentralization reaches a 55 percent value for the access to toilet facility, 65 percent for refuse disposal facilities (columns 1 to 3); and a lower value for sewage disposal facilities (49%) and primary school enrollment (52%) (columns 4 and 5). We observe that the effect of decentralization is monotone for drinking water access since the optimal level is above 1 (exactly 103 percent).

5.2 The non-linear effect of decentralization between *communes*

We now consider heterogeneous effect of decentralization between *communes* according to their wealth (Equation 3). Table 18 reports that this effect is generally lower for 20 percent of poorest *communes*. Moreover, while decentralization has no impact on average on primary school enrollment, it actually has a positive effect on rich *communes* and a negative one on the poorest *communes*.[24] As a robustness check, we interact a continuous variable, the DHS wealth index scores (W_{it}), with the degree of decentralization (see Table 19). Estimation results confirm that the positive effect of decentralization is contingent on a minimum wealth in *communes*. Only the effect of decentralization on access to drinking water seems not to depend on wealth. The coefficient associated with the degree of decentralization measures

[24] We complete our analysis with Wald tests to ascertain that coefficients for poor *communes* are significantly different from those in other *communes*.

the impact of decentralization in the absence of any wealth. Its negative sign indicates that a *commune* with zero wealth would suffer from decentralization.

5.3 The distributional effect of decentralization within *communes*

Finally, we analyze the distributional effect of decentralization on access to poverty-related services within *communes* using Gini coefficients (Equation 4). Table 20 highlights that a higher degree of decentralization is associated with higher inequalities in the access to basic services within *communes*, with the exception of drinking water, for which decentralization seems to reduce inequalities even if this effect is limited.

Once again, to improve the quality of our results we distinguish the decentralization impact on intra-jurisdictional inequalities according to *communes*' wealth (Equation 5). Table 21 emphasizes that decentralization is actually associated with higher inequalities in the access to basic services, especially within the poorest *communes.* This negative effect is weaker in non-poor *communes.* Estimation results also indicate that the reduction of inequalities in the access to drinking water is mainly explained by the decentralization effect on inequalities in non-poor *communes.*[25] This result slightly contrasts with Bardhan and Mookherjee (2006), who establish a relatively equitable intra-village benefits distribution and simultaneously a regressive inter-village allocation in West Bengal.

The following table sums up our empirical results considering the effect of decentralization

[25] Note that we also use Wald tests to ascertain that coefficients for poor *communes* are significantly different from those in other *communes.*

of the qualitative indicators only:

Table 22: Main empirical results

	Average effect	Non monotone average effect		Between *communes*		Within *communes*	Overall distrisbutional effect	
		D_{it}	D_{it}^2	Poor	Non-Poor		Poor	Non-Poor
Toilet facility	0.692***	2.190***	-1.96***	0.562*	2.544***	0.317***	0.259***	0.045***
Water access	2.361***	3.234***	-1.56***	2.120***	2.355***	-0.023**	-0.023	-0.03***
Refuse disposal	1.345***	1.700***	-1.31***	0.416**	1.162***	0.564***	0.867***	0.595***
Sewage disposal	NR	4.332***	-4.44***	0.231	0.139	0.147***	0.236***	0.125**
Primary educ.	NR	6.866***	-6.60***	-0.24***	0.656**	-	-	-

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level, NR: Non Robust.

6 Conclusion

Benin is a young democracy that has experienced a decentralization process since the end of the nineties. The main objective of this institutional reform was to improve public policy governance and finally to reduce poverty. Although heterogeneously affected by decentralization at the local level, Benin is one of those countries for which we can state that the recommendations of international organizations have clearly helped to institute a successful pattern of development..

In this paper, we study the average and distributional effects of decentralization on the access to poverty-related services. For the first time, we combine a dataset of well-being conditions of households and local public finance data to point out to what extent decentralization was successful. Our analysis suggests that decentralization has an unambiguous positive overall effect on the access to drinking water and sanitation systems.

Beyond this average pattern, decentralization however yields some distributional outcomes: its impact is non linear and heterogeneous. First, the effect of decentralization on the access to basic services follows an inverted U-shaped curve with an optimal degree of decentralization (at 67 percent on average) showing that a minimum level of central transfers is still beneficial. Second, decentralization affects service access differently according to

the *communes*' wealth, namely a positive effect for any non-monetary poverty indicators, and conversely the negative effect for the poorest *communes*. These results are consistent with those of Galiani, Gertler, and Schargrodsky (2008), who conclude that decentralization improves public services in only wealthier areas. Moreover, our study shows that decentralization can also generate intra-jurisdictional inequalities especially, within the poorest *communes*. Hence, if decentralization is a valid policy to improve overall access to basic services, it is essential to maintain a minimum level of central transfers, in particular for the poorest *communes,* to avoid an increase in intra- and inter-jurisdictional inequalities.

The decentralization process is a deep transformation of institutions and of the economic behavior of decision-makers that certainly results in well-being benefits, but at the expense of some inequalities due to historical, political, and governance practices.

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References

Akai, N., and M. Sakata (2002): "Fiscal decentralization contributes to economic growth: Evidence from state-level cross-section data for the United States," *Journal of Urban Economics*, 52(1), 93–108.

Alderman, H. (2002): "Do local officials know something we don't? Decentralization of targeted transfers in Albania," *Journal of Public Economics*, 83(3), 375–404.

Alesina, A., and E. L. Ferrara (2005): "Ethnic Diversity and Economic Performance," *Journal of Economic Literature*, 43(3), 762–800.

Alm, J., and J. Boex (2002): "An overview of intergovernmental fiscal relations and subnational public finance in Nigeria," International Studies Program Working Paper Series, at AYSPS, GSU paper0201, International Studies Program, Andrew Young School of Policy Studies, Georgia State University.

Arze, J., J. Martinez-Vasquez, and R. Puwanti (2008): "Local government fiscal competition in developing countries: The case of Indonesia," *Urban Public Economics Review*, pp. 13–45.

Azfar, O., and J. A. Livingston (2010): "Federalist disciplines or local capture? An empirical analysis of decentralization in Uganda," Discussion Paper W00/12, IRIS, University of Maryand.

Bardhan, P. (2002): "Decentralization of governance and development," *Journal of Economic Perspectives*, 16(4), 185–205.

Bardhan, P., and D. Mookherjee (2005): "Decentralizing antipoverty program delivery in developing countries," *Journal of Public Economics*, 89(4), 675–704.

——— (2006): "Pro-poor targeting and accountability of local governments in West Bengal," *Journal of Development Economics*, 79(2), 303–327.

Bardhan, P. K., and D. Mookherjee (2000): "Capture and governance at local and national levels," *American Economic Review*, 90(2), 135–139.

Barenstein, M., and L. de Mello (2001): "Fiscal decentralization and governance: A cross-country analysis," IMF Working Papers 01/71, International Monetary Fund.

Besley, T., and A. Case (1995): "Incumbent behavior: Vote-seeking, tax-setting, and yardstick competition," *American Economic Review*, 85(1), 25–45.

Besley, T., and S. Coate (2003): "Centralized versus decentralized provision of local public goods: A political economy approach," *Journal of Public Economics*, 87(12), 2611–2637.

Bird, R. M., and E. Rodriguez (1999): "Decentralization and poverty alleviation. International experience and the case of the Philippines," *Public Administration and Development*, 19, 299–319.

Cai, H., and D. Treisman (2005): "Does competition for capital discipline governments? Decentralization, globalization, and public policy," *American Economic Review*, 95(3), 817–830.

Caldeira, E., M. Foucault, and G. Rota-Graziosi (2008): "Decentralization in Africa and the nature of local governments' competition: Evidence from Benin„" Working Paper 1018, CERDI.

Case, A. (2001): "Election goals and income redistribution: Recent evidence from Albania," *European Economic Review*, 45(3), 405–423.

Chambas, G. (2010): *Mobiliser des ressources locales en Afrique subsaharienne*. Economica, Paris.

Cox, G., M. M. (1986): "Electoral politics as a redistributive game," *Journal of Politics*, 48(2), 370–389.

Davoodi, H., D. Xie, and H.-f. Zou (1999): "Fiscal decentralization and economic growth in the United States," *Journal of Urban Economics*, 45(2), 228–239.

Enikolopov, R., and E. Zhuravskaya (2007): "Decentralization and political institutions," *Journal of Public Economics*, 91(11-12), 2261–2290.

Faguet, J.-P. (2004): "Does decentralization increase government responsiveness to local needs? Evidence from Bolivia," *Journal of Public Economics*, 88(3-4), 867–893.

Fan, C. S., C. Lin, and D. Treisman (2009): "Political decentralization and corruption: Evidence from around the world," *Journal of Public Economics*, 93(1-2), 14–34.

Filmer, D., and L. H. Pritchett (2001): "Estimating wealth effects without expenditure data or tears: An application to educational enrollments in states of India," *Demography*, 38(1), 115–132.

Fisman, R., and R. Gatti (2002): "Decentralization and corruption: Evidence across countries," *Journal of Public Economics*, 83(3), 325–345.

Galasso, E., and M. Ravallion (2005): "Decentralized targeting of an antipoverty program," *Journal of Public Economics*, 89(4), 705–727.

Galiani, S., P. Gertler, and E. Schargrodsky (2008): "School decentralization: Helping the good get better, but leaving the poor behind," *Journal of Public Economics*, 92(10-11), 2106–2120.

Hayek, F. A. v. (1948): *Individualism and economic order*. Chicago: Chicago University Press.

Huther, J., and A. Shah (1998): "Applying a simple measure of good governance to the debate on fiscal decentralization," Policy Research Working Paper Series 1894, The World Bank.

Lin, J. Y., and Z. Liu (2000): "Fiscal decentralization and economic growth in China," *Economic Development and Cultural Change*, 49(1), 1–21.

Lockwood, B. (2002): "Distributive politics and the costs of centralization," *Review of Economic Studies*, 69(2), 313–37.

Martinez-Vazquez, J., and R. M. McNab (2003): "Fiscal decentralization and economic growth," *World Development*, 31(9), 1597–1616.

Meyer, S. A., and S. Naka (1999): "The determinants of Japanese local-benefit seeking," *Contemporary Economic Policy*, 17(1), 87–96.

Miguel, E., and F. Zaidi (2003): "Do politicians reward their supporters? Regression discontinuity evidence from Ghana," Discussion paper, Mimeo, University of California, Berkeley.

Oates, W. E. (1972): "Fiscal federalism," *New York: Harcourt Brace Jovanovich*.

Plümper, T., and V. E. Troeger (2007): "Efficient estimation of time-invariant and rarely changing variables in finite sample panel analyses with unit fixed effects," *Political Analysis*, 15(2), 124–139.

Prud'homme, R. (1995): "The dangers of decentralization," *World Bank Research Observer*, 10(2), 201–20.

Reinikka, R., and J. Svensson (2004): "Local capture: Evidence from a central government transfer program in Uganda," *The Quarterly Journal of Economics*, 119(2), 678–704.

Robalino, D. A., O. F. Picazo, and A. Voetberg (2001): "Does fiscal decentralization improve health outcomes? Evidence from a cross-country analysis," Policy Research Working Paper Series 2565, The World Bank.

Rutstein, S. O. (2008): "The DHS wealth index: Approaches for rural and urban areas," Discussion paper.

Rutstein, S. O., and K. Johnson (2004): "The DHS wealth index," Discussion paper.

Salmon, P. (1987): "Decentralisation as an incentive scheme," *Oxford Review of Economic Policy*, 3(2), 24–43.

Seabright, P. (1996): "Accountability and decentralisation in government: An incomplete contracts model," *European Economic Review*, 40(1), 61–89.

Tiebout, C. M. (1956): "A pure theory of local expenditures," *Journal of Political Economy*, 64, 416.

Treisman, D. (2000): "The causes of corruption: A cross-national study," *Journal of Public Economics*, 76(3), 399–457.

Wallis, J. J. (1998): "The political economy of New Deal spending revisited, again: With and without Nevada," *Explorations in Economic History*, 35(2), 140–170.

Winkler, D. R., and T. Rounds (1996): "Municipal and private sector response to decentralization and school choice," *Economics of Education Review*, 15(4), 365–376.

Wollera, G. M., and K. Phillips (1998): "Fiscal decentralisation and IDC economic growth: An empirical investigation," *Journal of Development Studies*, 34(4), 139–148.

World-Bank (2004): *World Development Report 2004: Making Services Work For Poor People*. New York: Oxford University Press.

Zhang, T., and H. fu Zou (1998): "Fiscal decentralization, public spending, and economic growth in China," *Journal of Public Economics*, 67, 221–240.

A Appendix

A.1 Figures

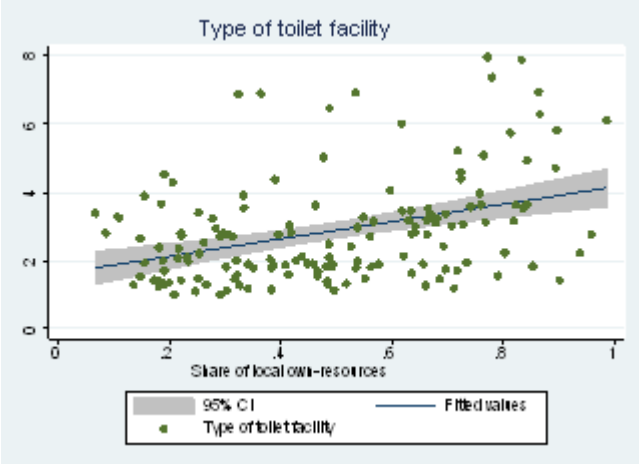


Figure 1: Share of local own-resources and access to toilet facility

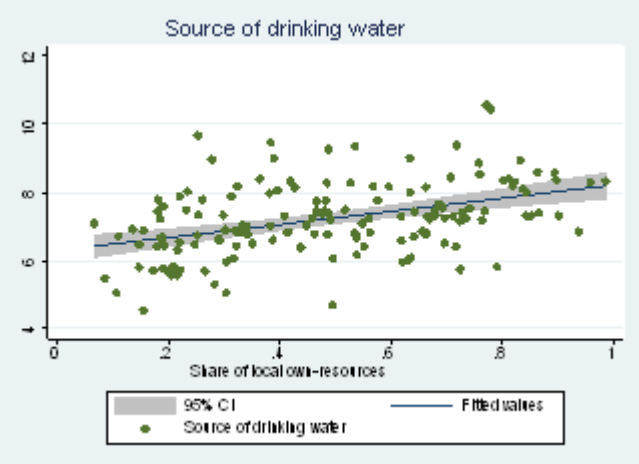


Figure 2: Share of local own-resources and access to water

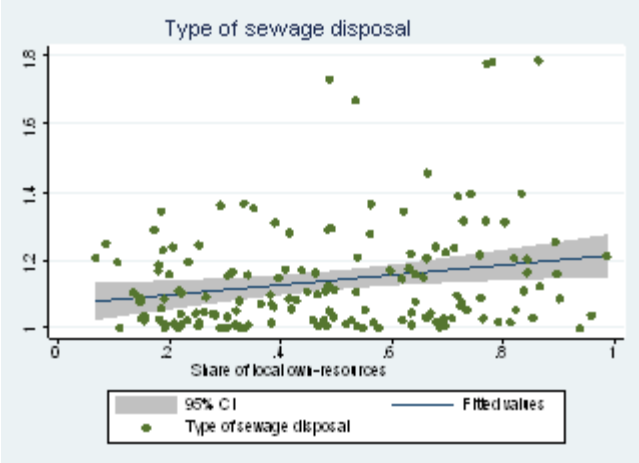


Figure 3: Share of local own-resources and access to sewage disposal.

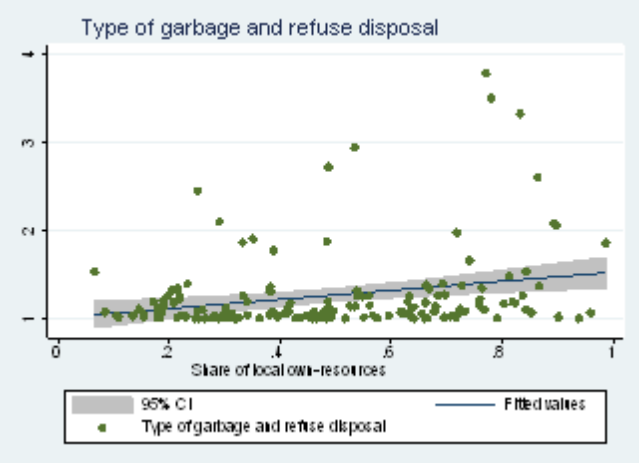


Figure 4: Share of local own-resources and access to refuse disposal.

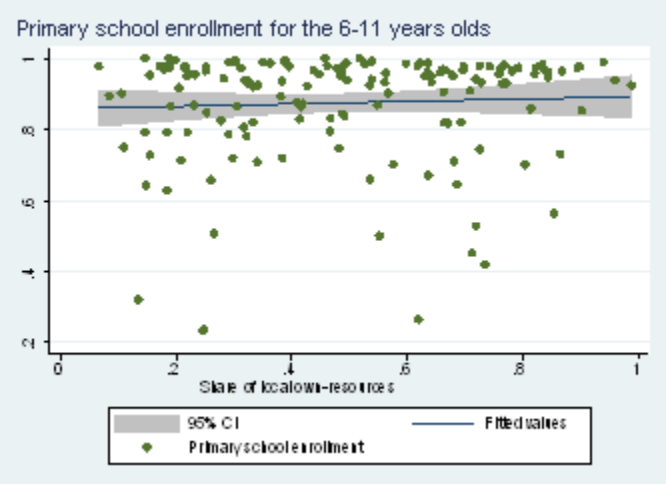


Figure 5: Share of local own-resources and access to garbage and primary school enrollment.

A.2 Tables

Table 4: Descriptive statistics

Basic services, Y_{it}	Mean	Std dev.	Min	Max
Degree of decentralization, D_{it}	0.484	0.235	0.066	0.986
Public spending per capita, G_{it}	7.218	0.778	4.521	9.436
Per capita consumption, C_{it}	11.754	0.464	10.513	12.970
Population size, Po_{it}	11.356	0.529	10.250	13.500
Population density, De_{it}	338.084	1050.57	7.382	9235.63
Urbanization rate, U_{it}	0.278	0.232	0	1
Ethnic fragmentation, F_{it}	0.357	0.232	0.013	0.822
Partisan affiliation, PA_{it}	0.305	0.461	0	1
Toilet facility				
$SToil_{it}$	0.237	0.208	0	0.969
$TToil_{it}$	2.836	1.541	1	7.958
Water access				
$SWat_{it}$	0.306	0.249	0	0.994
$TWat_{it}$	7.214	1.060	4.748	10.559
Refuse disposal				
$SGarb_{it}$	0.033	0.102	0	0.684
$TGarb_{it}$	1.255	0.466	1	3.785
Sewage disposal				
$SSew_{it}$	0.009	0.026	0	0.184
$TSew_{it}$	1.138	0.156	1	1.785
Primary education SE_{it}	0.876	0.149	0.236	1

Table 5: Correlations of our key variables

Variables	D_{it}	G_{it}	C_{it}	Po_{it}	De_{it}	U_{it}	F_{it}
Degree of decentralization, D_{it}	1						
Public spending per capita, G_{it}	0.3294*	1					
Per capita consumption, C_{it}	0.3128*	0.5646*	1				
Population size, Po_{it}	0.3095*	0.5025*	0.5801*	1			
Population density, De_{it}	0.2431*	0.4656*	0.7571*	0.8080*	1		
Urbanization rate, U_{it}	0.2513*	0.4117*	0.5505*	0.5379*	0.4089*	1	
Ethnic fragmentation, F_{it}	0.0258	0.2696*	0.0817	0.2895*	0.0153	0.3330*	1

*: Correlation coefficient significant at 10 % level.

Table 6: Correlations of our key variables

Variables	G_{it}	C_{it}	Po_{it}	De_{it}	U_{it}	F_{it}
Type of toilet facility, $TToil_{it}$	0.5155*	0.2760*	0.4030*	0.4274*	0.4108*	0.0018
Source of drinking water, $TWat_{it}$	0.5221*	0.3493*	0.3555*	0.3902*	0.2823*	0.1693*
Type of sewage disposal, $TSew_{it}$	0.3826*	0.1831*	0.4420*	0.4618*	0.3018*	0.0911
Type of refuse disposal, $SGarb_{it}$	0.2321*	0.2987*	0.5511*	0.6045*	0.3771*	0.0533
Primary school enrollment, SE_{it}	0.2286*	-0.0638	0.0461	0.1058	0.0962	-0.1412*

*: Correlation coefficient significant at 10 % level.

Table 7: Validity of our instrumental variable

Dependent variable: D_{it}	
Partisan affiliation, PA_{it}	**-0.026*** ** (0.000)
Public spending per capita, G_{it}	-0.027*** (0.002)
Per capita consumption, C_{it}	-0.053*** (0.004)
Population size, P_{it}	0.130*** (0.029)
Population density, De_{it}	0.002*** (0.000)
Urbanization rate, U_{it}	0.155*** (0.017)
Ethnic fragmentation, F_{it}	-0.104*** (0.029)
Constant	-0.182 (0.31)
Number of observations	145
Adjusted R^2	0.68
F-Statistic	54680
Fixed-effect	yes
Year dummies	yes
Sargan test (p-value)	0.519

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 8: Estimation results - The average effect of decentralization on the access to toilet facility (quantity)

Dep. var.:$STOil_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.370*** **	**0.249*** **	**0.184*** **	**0.116** **	**0.129** **	**0.140** **	**0.092***	**0.171*** **	**0.715*** **
	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.08)	(0.025)	(0.01)
Public spending per capita, G_{it}		0.126***	0.101***	0.109***	0.090***	0.066*	0.071**	0.030***	0.009
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.004)	(0.01)
Per capita consumption, C_{it}			0.133**	0.094***	0.086**	0.086**	0.099***	-0.001	-0.314*
			(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)	(0.21)
Population size, Po_{it}				0.102***	0.064*	0.021	0.049	0.021	-0.057***
				(0.02)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)
Population density, De_{it}					0.003**	0.003**	0.002**	0.005***	0.004***
					(0.001)	(0.01)	(0.001)	(0.00)	(0.001)
Urbanization rate, U_{it}						0.191***	0.234***	0.301***	0.242***
						(0.08)	(0.08)	(0.02)	(0.02)
Ethnic fragmentation, F_{it}							-0.188***	-0.131***	-0.052*
							(0.05)	(0.04)	(0.04)
Constant	0.049	-0.779***	-2.165***	-2.893***	-2.253***	-1.641***	-2.090***	-0.397*	-11.72***
	(0.03)	(0.22)	(0.46)	(0.52)	(0.71)	(0.58)	(0.65)	(0.20)	(1.06)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.17	0.35	0.41	0.46	0.49	0.96	0.54	0.92	0.96
F-Statistic	20.55	21.86	20.71	25.54	34.43	30.62	46.74	715.01	622.75
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 9: Estimation results - The average effect of decentralization on the access to toilet facility (quality)

Dep. var.:$TToil_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**2.531*** **	**1.905*** **	**1.871*** **	**1.537*** **	**1.660*** **	**1.734*** **	**1.553*** **	**1.471*** **	**0.692*** **
	(0.54)	(0.53)	(0.56)	(0.56)	(0.54)	(0.55)	(0.56)	(0.027)	(0.02)
Public spending per capita, G_{it}		0.718***	0.705***	0.749***	0.565***	0.402*	0.464**	0.273***	0.352***
		(0.19)	(0.20)	(0.20)	(0.21)	(0.22)	(0.21)	(0.019)	(0.02)
Per capita consumption, C_{it}			0.071	-0.119	-0.197	0.199	-0.249	0.189***	0.189***
			(0.36)	(0.34)	(0.34)	(0.35)	(0.37)	(0.006)	(0.007)
Population size, Po_{it}				0.498*	0.142	-0.150	-0.345	-0.411***	-0.260***
				(0.25)	(0.30)	(0.27)	(0.31)	(0.008)	(0.008)
Population density, De_{it}					0.003***	0.003***	0.004***	0.004***	0.003***
					(0.001)	(0.001)	(0.001)	(0.00)	(0.00)
Urbanization rate, U_{it}						1.284*	1.123*	1.298***	1.264***
						(0.68)	(0.73)	(0.01)	(0.01)
Ethnic fragmentation, F_{it}							-0.031	-0.229	-0.342
							(0.51)	(0.39)	(0.41)
Constant	1.542***	-3.202**	-3.940	-7.483	-1.405	-2.706	-5.178	-0.397*	0.043
	(0.25)	(1.27)	(3.94)	(4.97)	(5.54)	(5.28)	(5.92)	(0.20)	(0.11)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.15	0.26	0.26	0.46	0.32	0.35	0.34	0.89	0.87
F-Statistic	11.88	12.61	29.43	25.54	57.82	49.10	64.70	10608.02	992.44
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 10: Estimation results - The average effect of decentralization on water access (quantity)

Dep. var.:$SWat_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.365*** **	**0.260*** **	**0.220*** **	**0.192*** **	**0.212*** **	**0.207** **	**0.173** **	**0.230*** **	**0.654*** **
	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)	(0.028)	(0.01)
Public spending per capita, G_{it}		0.116***	0.101***	0.105***	0.076***	0.085***	0.087***	0.047***	0.047***
		(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.003)	(0.003)
Per capita consumption, C_{it}			0.081**	0.065	0.053	0.053	0.072	0.021	0.021
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.014)	(0.15)
Population size, Po_{it}				0.041	-0.148	0.002	0.022	-0.032	-0.064**
				(0.04)	(0.04)	(0.04)	(0.05)	(0.019)	(0.018)
Population density, De_{it}					0.005***	0.005***	0.004***	0.006***	0.006***
					(0.001)	(0.001)	(0.001)	(0.00)	(0.00)
Urbanization rate, U_{it}						-0.076	0.058	0.002	1.264***
						(0.10)	(0.11)	(0.003)	(0.01)
Ethnic fragmentation, F_{it}							-0.145*	-0.115***	-0.053***
							(0.08)	(0.01)	(0.012)
Constant	0.110***	-0.660**	-1.505***	-1.801***	-0.836	-1.080*	-1.480 **	-0.378*	0.110
	(0.04)	(0.19)	(0.47)	(0.51)	(0.62)	(0.65)	(0.71)	(0.21)	(0.20)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.12	0.24	0.25	0.26	0.29	0.30	0.34	0.88	0.87
F-Statistic	13.51	15.49	13.44	12.62	30.13	25.31	64.70	1537.87	992.44
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 11: Estimation results - The average effect of decentralization on water access (quality)

Dep. var.:$TWat_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**1.935*** **	**1.685*** **	**1.490*** **	**1.360*** **	**1.441*** **	**1.454*** **	**1.591*** **	**1.714*** **	**2.361*** **
	(0.32)	(0.34)	(0.35)	(0.37)	(035)	(0.36)	(0.37)	(0.22)	(0.27)
Public spending per capita, G_{it}		0.327***	0.250**	0.268**	0.147	0.117	0.133	-0.028	-0.028
		(0.12)	(0.12)	(0.12)	(0.12)	(0.14)	(0.13)	(0.034)	(0.037)
Per capita consumption, C_{it}			0.402*	0.327	0.276	0.275	0.143	0.185*	0.185*
			(0.21)	(0.22)	(0.22)	(0.23)	(0.24)	(0.11)	(0.10)
Population size, Po_{it}				0.194	-0.040	-0.092	-0.340	-0.434***	-0.528***
				(0.20)	(0.21)	(0.21)	(0.24)	(0.10)	(0.10)
Population density, De_{it}					0.002***	0.002***	0.003***	0.003***	0.003***
					(0.001)	(0.001)	(0.001)	(0.00)	(0.00)
Urbanization rate, U_{it}						0.228	0.001	0.216*	0.147
						(0.44)	(0.44)	(0.13)	(0.14)
Ethnic fragmentation, F_{it}							-0.934***	-0.933***	1.028***
							(0.34)	(0.02)	(0.03)
Constant	6.364***	4.186***	0.021	-1.363	2.649	3.382	7.297*	8.872***	9.616***
	(0.18)	(0.83)	(0.60)	(3.09)	(3.29)	(3.40)	(3.84)	(1.29)	(1.33)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.18	0.24	0.26	0.27	0.30	0.30	0.32	0.86	0.84
F-Statistic	17.44	14.71	11.33	10.42	51.08	45.16	82.58	142.652	188.52
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 12: Estimation results - The average effect of decentralization on the access to refuse disposal facility (quantity)

Dep. var.:$SGarb_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.137*** **	**0.092*** **	**0.081** **	**0.018**	**0.035**	**0.040**	**0.048**	**0.038*** **	**0.077*** **
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.007)	(0.01)
Public spending per capita, G_{it}		0.049**	0.044**	0.053***	0.027**	0.017*	0.019*	0.013***	-0.024***
		(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.001)	(0.001)
Per capita consumption, C_{it}			0.022	-0.012	-0.023	-0.023	-0.036	-0.006*	-0.006
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.003)	(0.004)
Population size, Po_{it}				0.019***	0.044**	0.025**	0.002	0.001	-0.012**
				(0.02)	(0.01)	(0.01)	(0.01)	(0.003)	(0.005)
Population density, De_{it}					0.005***	0.005***	0.005***	0.005***	0.005***
					(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Urbanization rate, U_{it}						0.084**	0.065*	0.069***	0.089***
						(0.03)	(0.03)	(0.06)	(0.009)
Ethnic fragmentation, F_{it}							0.074***	0.060***	0.065***
							(0.02)	(0.006)	(0.001)
Constant	-0.033**	-0.357**	-0.595*	-1.258***	-0.424	-0.424	0.205	-0.081**	0.161***
	(0.01)	(0.14)	(0.37)	(0.007)	(0.36)	(0.36)	(0.29)	(0.03)	(0.05)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.10	0.21	0.22	0.40	0.55	0.57	0.58	0.96	0.95
F-Statistic	4.26	4.26	3.30	4.50	67.65	56.65	79.65	89.10	79.30
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 13: Estimation results - The average effect of decentralization on the access to refuse disposal facility (quality)

Dep. var.:$TGarb_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.510*** **	**0.313** **	**0.260**	**0.098**	**0.176**	**0.189**	**0.176**	**0.225*** **	**1.345*** **
	(0.18)	(0.15)	(0.17)	(0.19)	(0.17)	(0.17)	(0.17)	(0.05)	(0.12)
Public spending per capita, G_{it}		0.218***	0.198***	0.219***	0.104*	0.074*	0.089*	0.044**	-0.078***
		(0.08)	(0.01)	(0.07)	(0.06)	(0.05)	(0.05)	(0.02)	(0.008)
Per capita consumption, C_{it}			0.108*	0.016	-0.032	-0.033	-0.067	-0.122***	-0.122**
			(0.09)	(0.11)	(0.11)	(0.11)	(0.11)	(0.03)	(0.05)
Population size, Po_{it}				0.241*	0.018	-0.034	-0.122	-0.144*	-0.365***
				(0.12)	(0.10)	(0.08)	(0.08)	(0.08)	(0.11)
Population density, De_{it}					0.002***	0.002***	0.002***	0.002***	0.003***
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}						0.023**	0.154	0.213***	0.276***
						(0.21)	(0.21)	(0.03)	(0.02)
Ethnic fragmentation, F_{it}							0.163	0.196***	0.359***
							(0.11)	(0.01)	(0.01)
Constant	0.973***	-0.466	-1.590	-3.308*	0.509	1.249	2.499*	3.568***	6.354***
	(0.07)	(0.56)	(1.58)	(2.05)	(1.72)	(1..30)	(1.37)	(0.92)	(1.30)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.07	0.18	0.19	0.25	0.41	0.41	0.42	0.83	0.81
F-Statistic	4.83	4.41	3.40	3.90	68.32	56.66	58.22	119.60	1317.32
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 14: Estimation results - The average effect of decentralization on the access to sewage disposal (quantity)

Dep. var.:$SSew_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.258*** **	**0.143** **	**0.105**	**-0.061**	**-0.018**	**-0.005**	**0.037**	**0.013**	**0.024*** **
	(0.09)	(0.06)	(0.07)	(0.10)	(0.09)	(0.09)	(0.08)	(0.009)	(0.002)
Public spending per capita, G_{it}		0.125**	0.110**	0.132***	0.068*	0.038*	0.034	0.020***	0.009***
		(0.05)	(0.04)	(0.04)	(0.04)	(0.002)	(0.02)	(0.002)	(0.001)
Per capita consumption, C_{it}			0.078	-0.016	-0.043	-0.044	-0.061	0.006	-0.001
			(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.008)	(0.001)
Population size, Po_{it}				0.248***	0.125**	0.072*	0.054	0.051***	0.004***
				(0.07)	(0.05)	(0.03)	(0.04)	(0.01)	(0.000)
Population density, De_{it}					0.001***	0.001***	0.001***	0.001***	0.001***
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}						0.235*	0.218*	0.226***	0.034***
						(0.13)	(0.13)	(0.05)	(0.01)
Ethnic fragmentation, F_{it}							0.157**	0.124**	0.012
							(0.07)	(0.05)	(0.008)
Constant	-0.038	-0.852**	-1.675*	-3.444***	-1.34	-0.587	-0.221	-0.897***	-0.069***
	(0.03)	(0.38)	(0.001)	(1.29)	(1.21)	(0.85)	(0.98)	(0.17)	(0.003)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.05	0.17	0.18	0.37	0.52	0.55	0.57	0.91	0.91
F-Statistic	4.00	3.17	3.38	3.25	21.06	18.75	19.07	235.90	350.65
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 15: Estimation results - The average effect of decentralization on the access to sewage disposal (quality)

Dep. var.:$TSew_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**1.412****	**1.101****	**1.008***	**0.390**	**0.578**	**0.613**	**0.680**	**0.142**	**-2.81*****
	(0.57)	(0.51)	(0.61)	(0.69)	(0.66)	(0.65)	(0.67)	(0.35)	(0.306)
Public spending per capita, G_{it}		0.388	0.352	0.433*	0.152	0.074	0.079	0.049**	0.049***
		(0.26)	(0.25)	(0.24)	(0.25)	(0.22)	(0.22)	(0.02)	(0.01)
Per capita consumption, C_{it}			0.190	-0.163	-0.282	-0.283	-0.357	0.595**	0.595***
			(0.41)	(0.38)	(0.38)	(0.39)	(0.40)	(0.06)	(0.06)
Population size, Po_{it}				0.924**	0.378	0.238	0.254	0.348	0.778**
				(0.36)	(0.34)	(0.30)	(0.34)	(0.36)	(0.38)
Population density, De_{it}					0.005***	0.005***	0.005***	0.004***	0.004***
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}						0.312*	0.656	0.503*	0.819***
						(0.79)	(0.79)	(0.29)	(0.30)
Ethnic fragmentation, F_{it}							0.274	-0.204	-0.637*
							(0.55)	(0.33)	(0.37)
Constant	-1.48***	7.909***	5.93	-0.634	8.682	10.643**	11.138*	-1.089	-4.494
	(0.23)	(1.83)	(5.07)	(6.16)	(6.19)	(4.92	(5.66)	(4.13)	(0.003)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.06	0.10	0.10	0.18	0.26	0.26	0.28	0.64	0.84
F-Statistic	6.22	4.61	3.47	3.68	47.77	40.32	49.20	35.87	140.55
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 16: Estimation results - The average effect of decentralization on the access to primary education

Dep. var.:SE_{it}	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree of decentralization, D_{it}	**0.019**	**-0.010**	**-0.016**	**-0.015**	**-0.011**	**-0.009**	**-0.039**	**0.003**	**0.242****
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.11)
Public spending per capita, G_{it}		0.031**	0.028*	0.028*	0.022	0.017	0.020	0.063**	0.031*
		(0.01)	(0.09)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Per capita consumption, C_{it}			0.122	0.013	0.010	0.010	0.023	0.134***	0.072**
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)
Population size, Po_{it}				-0.002	-0.013	-0.022	0.001	0.013	-0.036***
				(0.01)	(0.02)	(0.02)	(0.03)	(0.01)	(0.007)
Population density, De_{it}					0.001***	0.001***	0.002***	0.001***	0.001***
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}						0.038*	0.063	0.030***	0.040***
						(0.04)	(0.05)	(0.009)	(0.01)
Ethnic fragmentation, F_{it}							-0.131**	-0.056	-0.049
							(0.06)	(0.08)	(0.08)
Constant	0.777***	0.573***	0.446*	0.464**	0.652**	0.776*	0.3898*	1.809***	1.765***
	(0.02)	(0.11)	(0.22)	(0.25)	(0.35)	(0.40)	(0.45)	(0.26)	(0.32)
Number of observations	150	149	149	149	149	149	145	145	145
Adjusted R^2	0.35	0.37	0.10	0.37	0.38	0.38	0.41	0.58	0.52
F-Statistic	43.21	30.10	3.47	20.60	16.95	14.45	12.77	17.26	14.19
Fixed-effect	no	no	no	no	no	no	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 17: Estimation results - A non monotone effect of decentralization on the access to basic services

Dep. var.:	(1) $TToil_{it}$	(2) $TWat_{it}$	(3) $TGarb_{it}$	(4) $TSew_{it}$	(5) SE_{it}
Degree of decentralization, D_{it}	**2.190*** **	**3.234*** **	**1.700*** **	**4.332*** **	**6.866*** **
	(0.05)	(0.34)	(0.26)	(0.24)	(2.21)
D_{it}^2	**-1.96*** **	**-1.56*** **	**-1.31*** **	**-4.44*** **	**-6.60*** **
	(0.07)	(0.47)	(0.23)	(0.24)	(2.11)
Public spending per capita, G_{it}	0.030***	-0.026	-0.079***	0.003*	-0.009
	(0.004)	(0.03)	(0.01)	(0.001)	(0.01)
Per capita consumption, C_{it}	-0.008	0.182*	-0.121**	0.062***	0.138***
	(0.01)	(0.12)	(0.05)	(0.006)	(0.04)
Population size, Po_{it}	-0.002	-0.440***	-0.237**	0.088**	-0.112***
	(0.01)	(0.11)	(0.09)	(0.03)	(0.02)
Population density, De_{it}	0.005***	0.003***	0.003***	0.003***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}	0.359***	0.270*	0.422***	-0.077**	0.329***
	(0.02)	(0.16)	(0.01)	(0.03)	(0.10)
Ethnic fragmentation, F_{it}	-0.132**	0.921***	0.2131***	-0.021	-0.047
	(0.05)	(0.03)	(0.007)	(0.03)	(0.09)
Constant	-0.552**	8.667***	5.106***	0.212	2.302***
	(0.22)	(1.32)	(1.15)	(0.43)	(0.13)
Number of observations	145	145	145	145	145
Adjusted R^2	0.91	0.84	0.80	0.59	0.53
F-Statistic	577.64	96.49	87.06	149.11	19.60
Fixed-effect	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
Instrumental variable	yes	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 18: Estimation results - A differentiated effect of decentralization between *communes* (quintiles)

Dep. var.:	(1) $TToil_{it}$	(2) $TWat_{it}$	(3) $TGarb_{it}$	(4) $TSew_{it}$	(5) SE_{it}
$D_{it} * QP_{it}$	**0.562***	**2.120*****	**0.416****	**0.231**	**-0.24*****
	(0.28)	(0.29)	(0.19)	(1.24)	(0.03)
$D_{it} * (1 - QP_{it})$	**2.544*****	**2.355*****	**1.162*****	**0.139**	**0.656****
	(0.03)	(0.27)	(0.08)	(0.41)	(0.21)
Public spending per capita, G_{it}	-0.006	-0.063	0.088***	0.013	-0.010
	(0.005)	(0.03)	(0.01)	(0.14)	(0.01)
Per capita consumption, C_{it}	0.190***	0.189*	-0.121**	0.598**	-0.13***
	(0.02)	(0.10)	(0.05)	(0.24)	(0.04)
Belong to the first quintile, QP_{it}	-0.233**	-0.278***	-0.126***	-0.124	0.133***
	(0.10)	(0.08)	(0.01)	(0.53)	(0.10)
Population size, Po_{it}	-0.755***	-0.587***	-0.369***	0.313	-0.106***
	(0.01)	(0.10)	(0.12)	(0.25)	(0.03)
Population density, De_{it}	0.004***	0.003***	0.003***	0.004***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urbanization rate, U_{it}	1.400***	0.147	0.231***	0.551*	0.009**
	(0.01)	(0.13)	(0.03)	(0.46)	(0.004)
Ethnic fragmentation, F_{it}	-0.602	0.843***	0.115**	-0.247	-0.088
	(0.48)	(0.04)	(0.04)	(0.44)	(0.11)
Constant	7.575***	10.64***	6.719***	-0.434	3.465***
	(0.35)	(1.23)	(1.39)	(4.03)	(0.31)
Number of observations	145	145	145	145	145
Adjusted R^2	0.88	0.84	0.80	0.63	0.50
Fixed-effect	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
Instrumental variable	yes	yes	yes	yes	yes
Wald test: p-value	0.000	0.494	0.011	-	0.000

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 19: Estimation results - A differentiated effect of decentralization between *communes* (wealth)

Dep. var.:	(1) $TToil_{it}$	(2) $TWat_{it}$	(3) $TGarb_{it}$	(4) $TSew_{it}$	(5) SE_{it}
D_{it}	**-1.70*** **	**1.365*** **	**-0.94*** **	**-3.99*** **	**-0.64*** **
	(0.07)	(0.24)	(0.16)	(0.73)	(0.18)
$D_{it} * W_{it}$	**1.597*** **	**-0.01**	**0.762*** **	**2.312*** **	**0.399*** **
	(0.04)	(0.06)	(0.05)	(0.25)	(0.11)
Public spending per capita, G_{it}	0.017**	-0.065*	-0.084***	0.096***	-0.010*
	(0.008)	(0.03)	(0.01)	(0.02)	(0.005)
Per capita consumption, C_{it}	0.407***	0.052	-0.187***	0.652***	-0.148***
	(0.02)	(0.12)	(0.05)	(0.06)	(0.04)
DHS wealth index scores, W_{it}	0.274***	0.247***	0.114**	0.722***	0.064***
	(0.03)	(0.06)	(0.02)	(0.16)	(0.02)
Population size, Po_{it}	-0.482***	-0.451***	-0.177**	0.621	-0.001
	(0.04)	(0.13)	(0.08)	(0.39)	(0.006)
Population density, De_{it}	0.001***	0.003***	0.001***	0.004	0.006**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Urbanization rate, U_{it}	-0.048	-0.069	0.034	-0.158	-0.066
	(0.03)	(0.15)	(0.04)	(0.12)	(0.04)
Ethnic fragmentation, F_{it}	-1.265***	0.780***	-0.013	-0.784***	-0.176
	(0.29)	(0.06)	(0.05)	(0.28)	(0.14)
Constant	2.889***	10.93***	6.024***	-3.350	2.898***
	(0.64)	(1.58)	(1.05)	(4.38)	(0.07)
Number of observations	145	145	145	145	145
Adjusted R^2	0.88	0.85	0.81	0.57	0.50
Fixed-effect	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
Instrumental variable	yes	yes	yes	yes	yes
Wald test: p-value	0.000	-	0.000	0.000	0.000

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 20: Estimation results-The differentiated effect of decentralization on the access to basic services within *communes*

Dep. var.:	(1) $GToil_{it}$	(2) $GWat_{it}$	(3) $GGarb_{it}$	(4) $GSew_{it}$
Degree of decentralization, D_{it}	**0.317*** **	**-0.023** **	**0.564*** **	**0.147*** **
	(0.02)	(0.01)	(0.05)	(0.05)
Public spending per capita, G_{it}	-0.026***	-0.003***	-0.043***	-0.032***
	(0.001)	(0.000)	(0.002)	(0.000)
Per capita consumption, C_{it}	0.005	-0.016***	-0.093***	0.026***
	(0.008)	(0.002)	(0.01)	(0.003)
Gini coefficient of C_{it}, GC_{it}.	0.159***	0.118***	0.090***	0.072***
	(0.01)	(0.01)	(0.02)	(0.02)
Population size, Po_{it}	-0.029	-0.003	-0.114***	-0.020
	(0.02)	(0.002)	(0.01)	(0.01)
Population density, De_{it}	-0.002***	-0.001***	0.001*	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Urbanization rate, U_{it}	-0.055***	0.028*	-0.005	-0.044
	(0.01)	(0.01)	(0.03)	(0.03)
Ethnic fragmentation, F_{it}	0.056***	0.105***	0.015	0.024***
	(0.05)	(0.01)	(0.04)	(0.005)
Constant	0.646**	0.397***	2.520***	0.161
	(0.25)	(0.02)	(0.08)	(0.16)
Number of observations	145	145	145	145
Adjusted R^2	0.71	0.82	0.57	0.61
Fixed-effect	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
Instrumental variable	yes	yes	yes	yes

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level

Table 21: Estimation results-The differentiated effect of decentralization on the access to basic services between and within *communes*

Dep. var.:	(1) $GToil_{it}$	(2) $GWat_{it}$	(3) $GGarb_{it}$	(4) $GSew_{it}$
$D_{it} * QP_{it}$	**0.259*** **	**-0.023**	**0.867*** **	**0.236*** **
	(0.02)	(0.01)	(0.08)	(0.05)
$D_{it} * (1 - QP_{it})$	**0.045*** **	**-0.03*** **	**0.595*** **	**0.125** **
	(0.01)	(0.01)	(0.05)	(0.05)
Public spending per capita, G_{it}	-0.024***	-0.004**	-0.044***	-0.034***
	(0.001)	(0.001)	(0.002)	(0.001)
Per capita consumption, C_{it}	0.006	-0.015***	-0.093***	0.026***
	(0.008)	(0.002)	(0.01)	(0.004)
Gini coefficient of C_{it}, GC_{it}.	0.154***	0.108***	0.089***	-0.071***
	(0.01)	(0.01)	(0.02)	(0.01)
Belong to the first quintile, QP_{it}	0.005	0.007	-0.052***	-0.064***
	(0.002)	(0.03)	(0.005)	(0.004)
Population size, Po_{it}	-0.022	-0.006	-0.124***	-0.026*
	(0.02)	(0.002)	(0.01)	(0.01)
Population density, De_{it}	-0.002***	-0.001***	0.001*	0.003**
	(0.001)	(0.000)	(0.000)	(0.001)
Urbanization rate, U_{it}	-0.070***	0.026*	0.021	0.002
	(0.02)	(0.07)	(0.51)	(0.03)
Ethnic fragmentation, F_{it}	0.003	0.103***	0.052	0.035***
	(0.01)	(0.01)	(0.19)	(0.004)
Constant	0.614**	0.328***	2.591***	0.257
	(0.26)	(0.02)	(0.18)	(0.17)
Number of observations	145	145	145	145
Adjusted R^2	0.69	0.81	0.57	0.61
Fixed-effect	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
Instrumental variable	yes	yes	yes	yes
Wald test: p-value	0.000	-	0.000	0.000

Controls for serial correlation of the error term, ar1 Coccrane-Orcutt transformation. Robust standard errors are in brackets.

***: coefficient significant at 1 % level, .**: at 5 % level, *: at 10 % level