2-1-2021

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Electoral Accountability and Fiscal Federalism: The Case of Peru

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February 2021

Abstract

Accountability is at the heart of the democratic enterprise. One commonly touted benefit of decentralization is that it promotes this accountability by allowing sub-national governments to target fiscal policy more precisely to the varying preferences of people in different locales. But if accountability is really functioning as it should, then citizens should use the ballot box to reward and punish local officials for their concrete policy behavior. In other words, we should not only be able to link the presence of decentralization with improvements in local public goods, but we should also be able to connect voting behavior in specific locales with the competence of local politicians. Because of the empirical challenges, few scholars have attempted test this prediction directly. Using government information as well as data coded for this project, we examine the case of Peru, assessing how measures of local government success affect the probability of reelection and recall. We find that, when Mayors manage their waste collection and education portfolios more effectively, they are more likely to win office in subsequent elections. They are also less likely to be removed in recall votes. More than that, when Mayors spend more overall, and especially when they spend more on capital projects, we find that their probability of reelection improves, and their risk of recall declines. Overall, our results show clearly that Peru's citizens use their votes rationally to reward and punish locally elected politicians. This gives substance and support to the notion that, at least under certain circumstances, accountability can function well under decentralized government.

Keywords: Accountability, fiscal decentralization, reelection and recall, Peru

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1. Introduction

Accountability is at the heart of the democratic enterprise. If elections are to be meaningful, they should incentivize politicians to provide the combination of taxes, expenditures, and policies that their constituents desire. This is true for national governments, but it is even truer at the local level. Indeed, some authors have argued that accountability is the most salient advantage offered by fiscally decentralized systems (Seabright, 1996; Tommasi & Weinschelbaum, 2007). One commonly touted benefit of decentralization is that it allows sub-national governments to target fiscal policy more precisely to the varying preferences of people in different locales (Tiebout, 1956; Oates, 1972). Decentralization is also said to improve the flow of information between citizens and their elected officials, strengthening the ability of governments to understand their constituents' wants and needs (Oates, 2005).

Advocates of decentralization see it as improving accountability in three key ways. Decentralization increases knowledge about citizen preferences, strengthens the incentives of officials to consider those preferences when making policy, and allows for different policies in different locales (Shah, 2003; Hankla, Martinez-Vazquez, & Ponce-Rodriguez, 2019). When decentralization works, therefore, we should observe that the provision of local public goods becomes more efficient and responsive to the needs and preferences of taxpayers. And when it does not, we should observe local politicians paying the price at the ballot box.

Whether this happens in the real world is a critical question, with implications for whether decentralization can truly deliver on its promises. The bulk of the evidence that we have links the presence or absence of decentralization with performance and impact measures of local public good provision (Martinez-Vazquez, Lago-Peñas, & Sacchi, 2017). This is a useful approach and likely to be the only method of evaluating the question across numerous countries and years. However, such evidence is unable to show a direct link between the actions of local

governments and the rewards and punishments doled out by voters.

If accountability is really functioning as it should, citizens should use the ballot box to reward and punish local officials for their concrete policy behavior. In other words, we should not only be able to link the presence of decentralization with improvements in local public goods, but we should also be able to connect voting behavior in specific locales with the competence of local politicians. Using newly available, micro-level data on municipalities in Peru, we attempt in this article to do just that.

Peru's municipalities have sole responsibility for solid waste disposal and joint responsibility for education, among other functions. Mayors are popularly elected every four years, but (unlike in many other countries) Peru also has a robust system of recall, though one which has been used less frequently since reforms in 2015 allowed removed Mayors to nominate their successors. Using information from the Peruvian government as well as data coded for this project, we examine how measures of local government performance affect the probability of reelection and recall.

Peru's municipalities are funded through a combination of transfers from the center and local revenues. Previous scholarship has especially emphasized the role of revenue decentralization in promoting accountability,[1] and so, as we mention below, the significant role of transfers for Peru's local governments makes the country a more challenging case for fiscal accountability. If accountability functions in Peru, it should also function in more fully decentralized systems.

While Peru has received considerably less attention than many other countries from

[1] See for example, Rodden et al. (2003), Eyraud and Lusinyan (2013), and Martinez-Vazquez (2015).

scholars of decentralization, its unusual recall system has been the subject of at least two important studies in recent years. Sexton (2019) conducts a field experiment in the country to test whether citizens attending training workshops on local government are better able to hold municipal leaders to account. He finds that these workshops are associated with more disillusionment in the political process, and he also shows that Mayors often reduce the quality of their performance when threatened with recall. This unanticipated official backlash to local accountability efforts points to a potential dark side to the recall process as practiced in Peru. Similarly, Holland and Incio (2019) show that the recall process in Peru can be the subject of abuse. Women Mayors, they find, are more likely to on the receiving end of recall petitions, as are Mayors elected by a small vote margin.

While both papers point to the key role played by factors unrelated to performance, they find that the quality of Mayors does matter in recall elections. These findings, when taken on their own, are encouraging for the prospects of local accountability. However, both articles, despite their insights, rely on budgetary execution to measure performance and neither considers local elections themselves.

Our project takes these findings to the next step by considering hard measures of policy outcomes at the local level. We also look at both elections and recalls, and we consider more detailed aspects of the fiscal profile of local governments. We find that, when local officials manage their waste collection and education portfolios more effectively, they are more likely to win office in subsequent elections. They are also less likely to be removed in recall votes. More than that, we find that their probability of reelection improves, and their risk of recall declines, when local officials spend more overall, and especially when they spend more on capital projects.

Overall, our findings show clearly that Peru's citizens use their votes rationally to reward and punish local officials. These finding give substance and support to the notion that, at least under certain circumstances, accountability can function well in decentralized governments. Indeed, given that Peru's municipalities are largely dependent on central government transfers (see below), they are something of a hard case for decentralized accountability. After all, this accountability must function mostly through the expenditure side of local activity and is therefore more limited in scope than would be the case in more revenue decentralized systems, where raising own revenues brings more scrutiny from residents. The fact that local accountability nevertheless seems to function is therefore especially significant.

Going forward, we structure this article as follows: Section 2 presents the literature review on electoral accountability, fiscal decentralization, and government performance. Section 3 introduces our theory, as well as the testable hypotheses used in our empirical analysis. Section 4 summarizes the main characteristics of Peruvian local governments. Section 5 describes the data and the empirical methodology, while Section 6 presents the results and Section 7 concludes.

2. Literature Review

2.1 Elections and Accountability

Accountability, as defined by Seabright (1996), is the ability of citizens to elect or reject a government according to their evaluation of the government's performance. Institutions of local accountability aim to improve the efficiency of public spending by encouraging officials to design and deliver services in line with the demands of their citizens. The importance of these institutions, as described by Bovens (2005), lies in enhancing the legitimacy of public governance by allowing democratic control and improving performance. The focus of our article is the accountability that takes place through the electoral system, also termed electoral

accountability.

Elections are obviously the key mechanisms of electoral accountability, but they are sometimes supplemented by another institutional feature: the direct recall. This mechanism allows a pre-specified number of citizens to demand a popular vote on whether an elected official should be removed from office before the end of their term. There are, of course, similarities between elections and recalls. Both represent regularized means for citizens to reward or sanction elected public officials (Timmons & Garfias, 2015). That said, recalls – unlike elections – allow the removal of elected representatives before the end of their regular terms, with voters overseeing the collection of signatures to initiate the process. While in the case of elections, voters' decisions will likely reflect both prospective and retrospective evaluations, the recall decision is generally based entirely on evaluations of the past (Yilmaz, Beris, & Serrano-Berthet, 2008). Recall activation is expected to be more frequent in contexts of political distrust in the government's performance (Bowler, 2004).[2]

Scholars generally approach accountability using one of several theoretical lenses, the principal-agent model and the theory of economic voting prominent among them. According to the principal-agent model, the principals (voters) delegate to the agents (elected officials) a set of instruments to execute certain goals. A problem arises because the interests of the principal and the agent may be different, which can create inefficiencies and corruption (Adsera, Boix, & Payne, 2003).

[2] Other countries besides Peru allow the recall of elected officials, including some Indian states (Mathew & Mathew, 2003; Johnson, Deshingkar, & Start, 2005), and Ethiopia and Nigeria (Olowu, 2003). A different version of recall is Bolivia's "voto constructivo de censura" (constructive censorship vote), which allows the town council to remove the Mayor with a three-fifths majority vote (Hiskey & Seligson, 2003).

In the context of economic voting theory, by contrast, elections are the mechanism through which citizens reward or punish incumbent parties and public officials for their relative success in managing the economy (Lewis-Beck & Nadeau, 2011). The threat of losing office in the next election or being revoked compels public officials to deliver quality services and to refrain from extracting rents (Barro, 1973). Moreover, individual vote choices are determined by the retrospective and prospective evaluation of candidates, as well as by the voter's party identification (Stein, 1990). In the retrospective evaluation, citizens examine whether the state of the world has improved under the elected public official's watch and vote accordingly. In other words, voters use elections to reward or punish politicians (Maravall, 2007; Packel, 2008). In the prospective evaluation, voters' beliefs about the future performance of the economy influence their vote. Empirical work shows, however, that voters often make their choices based on factors beyond the governments' performance (Carlin & Singh, 2015). It also indicates that voters sometimes fail to impose sanctions because they do not have the resources or skills to evaluate the governments' performance or to properly assign the responsibility (Anderson, 2007; Bardhan & Mookherjee, 2006).

Even when voters are ready to hold their representatives to account, the literature points to other factors that can influence the effectiveness of voter influence; these include the characteristics of the electoral system, the political regime, and the political parties (Eaton & Schroeder, 2010). For example, local elections are more likely to succeed in creating accountable governments if they are competitive and voters judge candidates on their ability to provide services (Schmitter & Karl, 1991). In the case of the recall elections, some researchers warn that the threat of recall could strengthen the power of the incumbent (Qvortrup, 2011). And, finally, some scholars maintain that elections themselves may not be sufficient to improve accountability

since they only hold accountable elected officials, leaving out appointed bureaucrats (Ackerman, 2004). All these findings leave open the question of how effective accountability operates at the local level, especially in cases of fiscal decentralization.

2.2 Fiscal Decentralization and Accountability

Fiscal decentralization refers to the transfer of authority and responsibilities from the central to subnational governments. This transfer can take the form of administrative decentralization, where bureaucratic offices are territorially organized and given discretion to make decisions on how best produce and deliver services; political decentralization, where local elections are held; and fiscal decentralization, where local governments receive the power to tax and spend (see Hankla, 2009). In this article, we are primarily concerned with the second two forms, and especially with the question of whether the accountability generated by political decentralization incentivizes local governments to make the expenditure decisions desired by their constituents.

Broadly speaking (see Oates, 2005), the literature on decentralization has evolved from the discussion of the best allocation of competencies and revenue sources across levels of governments (first-generation theory) to an analysis that incorporates the role of institutions and public officials' incentives (second-generation theory). According to the first-generation theory of fiscal federalism, the devolution of tax and expenditure authority to lower levels of government yields greater public sector efficiency; elected public officials are considered benevolent maximizers of the social welfare (Tiebout, 1956; Musgrave, 1959; Oates, 1972). Second generation scholars, by contrast, incorporate a public choice and political economy perspective into fiscal federalism. They also consider the problems of information (Oates, 2005)

and the incentive effects of different intergovernmental arrangements (Weingast, 1995).[3]

Whatever their differences, both the first and second generation literature agree that the benefits of both revenue and expenditure decentralization are contingent on the functioning of an effective accountability mechanism. On the expenditure side, fiscal decentralization allows sub-national governments to target the provision of goods and services to the preferences of their constituents. When political decentralization is also present in the form of elections, sub-national governments should be accountable to these constituents and incentivized to provide the public goods they desire. They should also be accountable to their constituents for the management of their funds, including for budget balances and capital versus current expenditures.

Past scholars, however, have particularly emphasized the importance of revenue decentralization in facilitating accountability (Bird, 2009). For example, Asatryan, Feld and Geys (2012) found evidence using a sample of OECD countries that greater revenue decentralization is associated with improved sub-national government budget balances. Of course, most countries, in practice, show large vertical imbalances, with subnational expenditures far exceeding subnational own revenues. Whatever the cause of this fiscal policy choice, the final effect is often a culture of transfer dependence, with subnational officials potentially being less accountable and likely resulting in less efficient spending, lower tax effort and irresponsible borrowing behavior (Stein, 1999; Ross, 2001; Rodden, 2003; Paler, 2013; Jia et al., 2020). More specifically, the risk of being financed mostly with transfers is that elected public officials are less accountable for their financial decisions because they can increase spending without increasing taxes, relieving electoral pressure (Paler, 2013; Ross, 2001). Also, this form of

[3] For a comparative review of the first and second generation theory of fiscal federalism, see Martinez-Vazquez, Lago-Peñas, & Sacchi (2017), Oates (2005), and Weingast (2009).

financing can reduce autonomy in public spending decisions and cause a delay in the operations of local governments since most transfers are earmarked to a particular purpose and require an approval process.

Another potential impediment to sub-national accountability, which applies whatever the vertical fiscal system, is manipulation of taxing and spending according to the electoral cycle. The theory of political business cycles (PBC), originating with Nordhaus (1975), proposes a model in which incumbent politicians manipulate the budgets and economic conditions to gain electoral advantage. Most studies show that voters reward increased public expenditure at national, regional and local levels (Akhmedov & Zhuravskaya, 2004; Litschig & Morrison, 2012). Other researchers conceive the PBC mechanism through changes in the composition of expenditure rather than its level (Rogoff, 1990). Mayors, they argue, are more likely to manipulate the expenditure components that are visible to the electorate in a manner that could signal greater competence. For example, opportunistic behavior might focuses on investment expenditures that are highly visible to the electorate, such as infrastructure (Veiga & Veiga, 2007). Alternatively, capital expenditure might be more rigid due to its long-term nature and also challenging to coordinate with elections. For example, there is evidence for developed and developing countries, that during election years, public spending shifts towards more visible current expenditure (Katsimi & Sarantides, 2012; Vergne, 2009).

Overall, the literature on government performance has been extended from being initially associated with cost-efficiency improvements to having more emphasis on budget effectiveness. For example, fiscal prudence refers to discipline in the use of public funds (Rodden, 2002; Yilmaz, 1999), and there is evidence that voters can reward such prudent behavior (Brender, 2003). Moreover, a good number of authors have highlighted the importance of expanding the

concept of performance from traditional measures of monetary resources to include information on purpose, direction, and impact of government organizations (Ammons, 1997; Carnevale & Carnevale, 1993; DuPont-Morales & Harris, 1994).[4] Whatever the case, all of these challenges make it particularly critical to test empirically whether accountability is truly functioning at the sub-national level.

2.3 Bringing the Literature into Conversation

Let us, then, draw together these strands of past research. According to the literature on fiscal decentralization, transferring resources and responsibilities to lower tiers of government can improve public spending efficiency, partially due to accountability and the political participation of citizens. According to the literature on electoral accountability, government performance can be improved by providing a mechanism through which citizens can reward or punish public officials.

It is clear that our understanding of accountability and its links to decentralization and government performance has improved dramatically. Nevertheless, some important gaps in our knowledge persist. First and foremost, we have few studies that can draw a direct empirical link between local performance indicators and the exercise of democratic mechanisms by voters. There is reason to believe that accountability works in the real world, but there are also many potential impediments to its operation. We need more direct evidence to know for sure. Do citizens consider concrete performance indicators when voting? Only if they do will local elected officials be incentivized to provide good governance.

Another problem is that the evidence for accountability that does exist is concentrated at the national level. According to a study done by Berry and Howell (2007), less than 1% of the

[4] Table A1 in the appendix shows common types of subnational government performance measures.

212 articles on elections published between 1980 and 2000 in five top political science journals examined local elections, none of which concerned retrospective voting. Moreover, the lion's share of studies of accountability have, understandably, focused on elections. By contrast, scholars have paid considerably less attention to recall processes as a mechanism of accountability.

Finally, there has been almost no research looking at whether local leaders are held accountable for the sources and components of their expenditures. While the public finance literature on expenditure composition and on vertical fiscal systems is expansive, few studies have explored the relationship between these structures and elections (much less recall). Presumably, voters value prudent fiscal management, and they may also prefer leaders who engage in a relatively large amount of capital as opposed to current expenditure, which is more visible and less at risk of diversion for clientelist purposes. Whether this is true empirically, however, is an open question. For all these reasons, our exploration of the link between performance and expenditures on the one hand, and elections and recall on the other is unique, particularly in its focus on local authorities. If we are able to find strong evidence of systematic, local policy responsiveness there, it will put us in a better position to assess the complex paths through which such responsiveness may operate.

3. Tying It All Together: Our Hypotheses

We draw on the varied concepts discussed above to specify our tests of accountability in Peruvian local governments. Beginning with the issue of governance quality, we expect that citizens will hold their elected local officials accountable for the quality of service delivery, which is measured in our empirical models with performance indicators for solid waste management and for primary education. As we discuss below, solid waste removal is managed

mostly at the local level in our empirical case of Peru,[5] while the responsibility for primary education is shared across all three tiers for government. If accountability is indeed present, citizens will reward local officials with reelection and punish them with recall based on their performance in these two policy areas.

Put differently, better performance in both types of services should decrease a Mayor's probability of being revoked and increase their probability of being reelected. If we find that this accountability is operational in both service areas, and especially in the more defuse area of primary education, it will constitute strong support for our arguments. Holding other variables constant, then, we formally specify the following four hypotheses:

- Mayors who provide a daily collection of municipal solid waste (MSW) have a lower probability of being recalled than those who do not offer the service daily.
- Mayors who provide a daily collection of MSW have a higher probability of being reelected than those who do not offer the service daily.
- An increase in the percentage of dropouts among students in primary school increases Mayors' probability of being recalled.
- An increase in the percentage of dropouts among students in primary school decreases Mayors' probability of being reelected.

In addition to the relationship between policy outcomes and accountability, we are also interested in how specific types of expenditure affect reelection and recall. While it is clear that we should expect better performance to improve the prospects for reelection and reduce the risks for recall, the expected relationship between expenditure and accountability may be less straightforward. In general, however, we expect that higher expenditures on public goods that matter to citizens should improve the chances that local leaders will win elections and avoid recall.

[5] In the case of dangerous and non-dangerous waste generated by productive areas or industrial facilities, the management is performed by central government agencies. (Art. 24 General Law of Solid Waste).

This should be especially the case in systems like Peru (in common with the large majority of countries) where local authorities are primarily financed by vertical transfers. Here, the question is whether local officials are able to secure more resources from the center and are effectively channeling them to the provision of public goods that matter to citizens. When local governments raise their own revenue, of course, the support gained from more spending must be balanced by the negative effects of higher taxes, and so the relationship may be less clear. These considerations lead us to two additional hypotheses:

- An increase in total local expenditure decreases Mayors' probability of being recalled.
- An increase in total local expenditure increases Mayors' probability of being reelected.

Finally, we analyze whether the composition of local expenditure has different effects on electoral outcomes. Following the conventional economic classification used for expenditure budgets and the approach of Veiga (2007), we distinguish between current and capital expenditure. Further, we assume that capital expenditures are more highly visible than current expenditures to the electorate. This is because investment projects such as infrastructure improvement are more readily discernable than, for example, civil service hires.

Current expenditures are not only less visible but also more at risk of being diverted to corrupt or patronage-based uses and may be less likely to yield long-term benefits. The inability to follow through with an investment project may be more readily apparent to voters, and harder to hide for politicians, than the diversion of current expenses. For all of these reasons, we expect that local leaders are likely to be rewarded by their constituents for a relative emphasis on capital spending in their overall budgets.

In addition to these considerations, there is the question, alluded to above, of whether local leaders have been effective at mobilizing vertical transfers from the central government

ministries and other agencies. We would expect that effectively attracting more central financing would increase the popularity of these local leaders, especially since these moneys would not come directly from constituents' wallets. In that context, we specify the additional four hypotheses as follows:

- A higher level of capital expenditure per capita (controlling for current expenditure per capita) decreases Mayors' probability of being recalled.
- A higher level of capital expenditure per capita (controlling for current expenditure per capita) increases Mayors' probability of being reelected.
- An increase in the portion of expenditures financed with transfers decreases Mayors' probability of being recalled.
- An increase in the portion of expenditures financed with transfers increases Mayors' probability of being reelected.

Other variables we control for are political alignment of the district municipality (the lower sub-national level) with the provincial municipality (the higher sub-national level) We also control for altitude, land area, and average household expenditures to assess general access to public services, as well as for the size of the district and its economic condition. The expected effects of these control variables are summarized in Table 1.

Table 1. Expected Impact on the Probability of Being Revoked and Reelected

Independent variables	**Probability of being:**	
	Revoked	**Reelected**
Performance		
Provides daily trash collection service	negative	positive
Percentage of dropouts in primary education	positive	negative
Fiscal performance		
Percentage of expenditure financed with Transfer	negative	positive
Log of exp. per capita financed with Transfer	negative	positive
Log of total exp. per capita	negative	positive
Log of capital exp. per capita	negative	positive
Log of current exp. per capita	uncertain	uncertain
Political variables		
Political alignment	negative	positive
Male Mayor	negative	positive
Number of candidates	uncertain	uncertain
Socio-economic variables		
Log of Avg. of HH monthly exp. per capita, 2013	uncertain	uncertain

Log of Altitude (meters above sea level)	uncertain	uncertain
Log of Territory (square kilometers)	uncertain	uncertain

4. Our Empirical Case: Peruvian Local Governments

To test our hypotheses, we make use of extensive new data on local governments in Peru. In this sense, our work fits into the "local turn" of much recent work in political economy (Singh, 2017). The quality and specificity of the data that we use here allows us to construct a much more robust test of our arguments than would be possible in a cross-national test. Of course, in taking this approach, we risk losing some of the benefits of generalizability available in broader empirical work. But these benefits are compensated for by the greater confidence we can have in the identification of the relationships we test. Moreover, Peru is an excellent case for our purposes; given that its decentralization process is relatively recent, it is likely that any effects we find here will also hold in other contexts. We turn now to a brief explanation of the structures and functions of local governments in Peru.

4.1 Administrative and Political Organization

Peru has been undergoing a decentralization process since 2002.[6] Today, there are three major tiers of government: national, regional, and local (or municipal), with this last tier divided into provincial and district municipalities. Local governments approve their own budgets and do not depend hierarchically on the regional governments. In the same way, district municipalities do not depend hierarchically on the provincial municipalities.[7]

Local governments consist of a Municipal Council as the policymaking, regulatory and oversight body, the Mayor as the head of the executive organ, and a Local Coordination Council (CCL) in charge of promoting public participation mechanisms. As we will see, citizens have the

[6] The first attempt of decentralization started at the end of the 1980s. The process reflected the incentives of the ruling party at the time to build up a subnational power base (Kim, 1992). After following a gradual approach, in 2006, the central government accelerated the transfer of responsibilities (CGP, 2014).
[7] The population and number of district municipalities are shown in Table A2.

right not only to elect their local authorities, but also to request their vacancy or recall from office. The vote is universal and compulsory until the age of 70 under the imposition of a fine. Local authorities are elected for four years and, until 2018, could run for immediate reelection.[8]

Electoral rules and the local political environment influence the elections; voters can only cast a single ballot for both Mayor and Local Council, so even if the winning list receives less than 50%, the Mayor's party is assured a majority on the local council. Also, small political organizations do not face a serious threat of being excluded from future elections if they do not reach a minimum number of votes (Crabtree, 2010; Morgenstern & Green, 2009). This has caused an increase in the number of lists that compete in local elections (see Table A3), which results in a higher vote dispersion across parties and reduces the percentage of votes obtained by the winner.[9]

The role played by traditional national political parties has also been significant. In 1980, national parties had almost full control of local governments. After the 2002 decentralization process, subnational political organizations, particularly regional movements, became the leading force in local politics. In 2014, regional movements had control of more than 50% of local governments (Aragon, Makarin, & Pique, 2015).

The design of the electoral mechanism and the degree of institutionalization of political parties also help explain the significant use of recall referendums (CPRs) (Welp, 2016). To start a recall referendum, the National Election Board requires the collection of signatures, but it does

[8] Mayors are elected by the highest number of votes. An election held in any district or province is declared invalid if the null or blank votes exceed two thirds of the number of valid votes.
[9] Between 1998 and 2006 only a small percentage of local authorities were elected by majority. In 2002, 1.5% of the local authorities elected got more than 50% of the votes. In 2006, 57% of the local authorities elected got between 22% and 33% of the votes (ONPE, 2010).

not mandate a legal process to demonstrate acts of corruption or bad management.[10] Since its first application in 1997, there have been ten rounds of recalls where more than 5,000 subnational authorities have been evaluated and more than 1,700 were revoked (see Table A4).[11]

4.2 Public Expenditure Structure

The central government has issued several laws to set the expenditure responsibilities of subnational governments. Among local governments, provincial and district municipalities have the same expenditure responsibilities; the former also have other additional service responsibilities that extend to the district municipalities within the provincial boundaries.

Subnational spending has increased in recent years. The share of total general government spending executed by local governments rose from 13% in 2004 to 20% in 2014. As percent of GDP, local government spending rose from 2.5% in 2004 to 4.3% in 2014 (see Table A5). However, there are also great horizontal disparities, and the richest district municipality has a per capita spending 250 times the spending of the poorest one (see Table A6).

One of the challenges in the assignment of expenditure responsibilities is the wording of the regulation. Many functions overlap between the central government and subnational governments, and often there is little clarity in their definitions (see Table A7). The spending patterns of the municipalities have also been affected by increased revenue sharing transfers. As the proceeds from extractive industries (the so-called Canon transfers) are by law earmarked to finance investment projects and associated infrastructure maintenance spending, a significant

[10] The most recurrent grounds to request a CPR are: i) non-fulfillment of electoral promises, ii) the authority does not call for open councils, iii) irregularities in the procurement process, iv) does not develop infrastructure, and v) does not perform all his/her functions (ONPE, 2013a).

[11] Based on this situation, in 2015, the Congress adjusted the laws that regulate elections and recall process. The new regulation prohibited the immediate reelection of subnational authorities and required them to resign six months before the election if they want to run for a different position. Also, there is only one recall process during the third year of the administration period and the replacements of the revoked authorities will remain in office until the end of the administration period.

permanent bias towards capital spending was created in the structure of subnational expenditures. As a result, allocations for public infrastructure projects in the general budget have increased on average from 30% in 2004 to 65% in 2014 for local governments; however, municipalities often have limited capacity to execute investment projects and face weak incentives to build interjurisdictional infrastructure (Martinez-Vazquez et al., 2017) .

To test the relationship between government performance and electoral outcomes, as discussed above, we select two services provided by local governments: Municipal Solid Waste (MSW) management and Education. The provision of the first service relies almost exclusively on local governments, which makes it easier for citizens to identify where responsibility lies. The second one is a shared responsibility between the central, regional, and local government, and therefore puts a harder test on the accountability hypotheses.

4.3 Municipal Solid Waste (MSW)

Peruvian regulation makes the provincial municipalities responsible for managing the solid waste of domestic and commercial origin. Also, in coordination with the health sector at the national level, they evaluate and identify the appropriate spaces to implement supervised sanitary landfills.[12] The district municipalities are responsible for the collection and transportation of these solid wastes, as well as for the cleaning of streets and public spaces. They also have the task of ensuring that fees are charged for the provision of the service based on the criteria established by the provincial municipality (MINAM, 2016). Besides the fees, the service is also financed from taxes and transfers. During 2013, Peru generated more than 7 million tons of municipal solid waste (MSW), 64% household and 36% non-household (see Figure A1).[13] Even

[12] Agency for Environmental Assessment and Enforcement (OEFA). Report 2013-2014 (in Spanish).
[13] Peru has a population of more than 30 million and more than 23 million live in cities (urban population), representing 76% of the total population. The national average of MSW is more than 18 thousand tons per day, of which only 48% is disposed in a supervised sanitary landfill; the remnant is being inadequately disposed of in the open environment (MINAM, 2014).

though the service is provided by almost 97% of all municipalities, only 38% of this group offers a daily service.[14]

4.5 Education

The main challenge in the Peruvian education system is the quality of the service. Peru ranks last among the 65 countries that participated in the Programme for International Student Assessment (PISA) in 2012.[15] All levels of government share the responsibility of provision of education services. At the central level, the Ministry of Education manages education policy in coordination with regional governments. Local governments, for their part, are not directly responsible for the provision of educational services, but rather their role is to support and promote education. Within this latter role, possibly the main task of local governments is the provision of infrastructure and equipment for schools (World Bank, 2010a).

The design of the decentralization of education in Peru has been inefficient, and the subnational governments' expenditure powers are not well defined in the legal framework. Thus, there are overlaps and also contradictions in the responsibilities among levels of government (Consejo Nacional de Educación, 2010). The budget structure for education limits the autonomy of decentralized bodies and their ability to improve the quality of services. The budget allocation is based on historical records, which limits the possibilities of subnational governments to generate significant changes. Also, the funding mechanisms have proved more complex than expected, which has led to delays in the transfer of resources and raised transaction costs for the provision of education services (World Bank, 2010a).

[14] National Institute of Statistics and Informatics (INEI). Peru: Municipal Management Indicators, 2019 (in Spanish).
[15] PISA is an international survey which aims to evaluate education systems. The exam is prepared by the Organization for Economic Cooperation and Development (OECD). http://www.oecd.org/pisa/aboutpisa/

4.6 Revenue Structure

Peruvian municipalities generate revenues from taxes and user charges (for services like street cleaning, road tolls, parks maintenance, public safety services, and construction permits).[16] District municipalities collect the property tax and the tax on transfers of real estate, and provincial municipalities collect the tax on motor vehicles and taxes on public entertainment, lotteries, and gambling. However, the current fiscal decentralization framework provides low revenue autonomy to subnational governments (Canavire et al., 2015).[17] The central government sets the tax rates and regulations on the tax bases. The main characteristics of tax revenue assignment can be seen in Table A8.

Overall, local taxation exhibits low efficiency due to generous exemptions, weak tax administration, and the lack of a complete or updated cadaster of properties (Alfaro & Rühling, 2007). Although there has been a recent improvement in tax collection (see Table A9), the performance of the main local tax (property tax) is significantly low relative to other countries in the region (Martinez-Vazquez & Sepulveda, 2012) (see Figure A2).

Overall, the share of own revenues over total revenues has experienced a decreasing trend, falling from 36% in 2004 to 26% in 2014. In the case of tax revenues, they represent less than 5% of total revenues for most local governments. There are substantial revenue disparities among local governments, but in general there is significant dependence on intergovernmental transfers. Only in the municipalities of Metropolitan Lima – the capital city – does the tax revenue represent as much as 40% of total revenues. As a result, local governments' finances heavily rely on intergovernmental transfers to bridge the gap between increasing spending needs

[16] Local governments also have access to borrowing, but due to their reduced access to credit markets and the tight borrowing restrictions, the level of indebtedness is very low.

[17] Tax assignments for local governments had been defined in 1993 and the decentralization laws did not change them substantially. In the case of regional governments, they do not have tax assignments and their own revenues consist of user charges, fees, and other small revenue sources.

associated with the gradual decentralization of functional responsibilities and their low capacity to raise their own revenues.

4.7 Intergovernmental Transfers

There are two major types of intergovernmental transfers to local governments: Canon and FONCOMUN (FCM). The first comes from sharing in the proceeds of the exploitation of natural resources; it is allocated on an origin basis and earmarked for investment and some maintenance spending.[18] The FCM, on the other hand, is an unconditional equalization transfer that is assigned to all local governments by a measure of expenditure needs.[19] There is a third earmarked transfer, "Ordinary Resources" (OR), set to finance operating costs of decentralized functions; however, its allocation criteria seem more discretionary compared to the other two and these resources are much more significant at the regional than the local level.[20]

The share of Canon in the local governments' revenue increased from 15% in 2004 to 39% in 2011 and then fell to 32% in 2014 due to the variation in international commodity prices (see Table A11). The evolution of the Canon is the most significant factor influencing the distribution of fiscal resources among local governments, as well as their revenue and spending patterns. There are around 500 district municipalities (or 30% of all district municipalities) for which natural resource-related revenues account for 50% or more of the total (World Bank, 2010b).

[18] The central government collects the taxes from the mining companies and then distributes to subnational governments. The distribution criteria is shown in Table A1.
[19] It was established in 1994 with the objective of promoting investment in local governments. It is financed by the Municipal Promotion Tax (IPM) which is a surtax rate of 2% on top of the central government's VAT; a tax on vehicles that use gasoline; and, a tax on recreational crafts.
[20] Other transfers, less significant in terms of their magnitude, include the Fund for the Promotion of Regional and Local Public Investment which provides matching grants for investment projects directed to reduce infrastructure and social service delivery gaps; the Socioeconomic Development Fund of the Camisea Project that finances basic social infrastructure investments in areas affected by the Camisea Project; and the conditional cash transfer for the modernization of municipalities.

On the other hand, the relative importance of FCM on local governments' revenues has slightly decreased over time, from 30% of total revenues in 2004 to around 25% in 2014 (see Table A11). Its allocation formula does not include fiscal capacity, which means that beneficiaries with high fiscal capacity such as the local governments that receive Canon, also receive FCM transfers proportionate to their expenditure needs (Martinez-Vazquez et al., 2017).[21]

5. Data and Empirical Methodology

The main objective of our empirical analysis is to examine the extent to which government performance and expenditure structures affect the probabilities of a Mayor of being reelected or recalled. For this purpose, we perform a cross-sectional analysis of Peruvian municipalities and include a set of control variables to isolate their specific features. The Mayor of the district municipality is the unit of analysis.

We compile our dataset using information from several public organizations[22] and provide the list of variables and summary statistics in Table 2 and Table 3. Our sample considers 1,632 district municipalities for the period 2011-2014.[23] From that group, 1,267 district Mayors (77.6%) were not part of the recall process, 276 (17%) were part of the recall process but not revoked, and 89 (5.4%) were revoked. Also, 1,020 (62.5%) decided to run for reelection, in which 319 (31.3%) won and 701 (68.7%) lost.

[21] The first stage in the allocation process considers the expenditure needs at the province level to determine the total to be assigned to the province, which affects the districts whose expenditure needs are "higher" than the overall province. For example, two identical districts may receive different transfer amounts just because they are in provinces with overall different fiscal needs. The formula also guarantees a minimum transfer level to all local governments which offset the effect of considering measures of expenditure needs.

[22] The Ministry of Finance (MEF), Ministry of Education (MINEDU), Ministry of Environment (MINAM) and from the National Institute of Statistics and Informatics (INEI). The electoral data was collected from the National Office of Electoral Processes (ONPE) and the National Election Board (JNE).

[23] We took out from the sample the municipalities that were created after 2010 and the case of a province that has only one district. The evolution of the number of districts is shown in Table A.2.

Table 2. Variable Definitions and Sources

Variables / Definition	Period	Source
Dependent variables		
Recall (RECALL): 0 "Mayor was not part of a recall process" 1 "Mayor was part of a recall process, but not revoked" 2 "Mayor was part of a recall process and revoked."	2012 & 2013	National Office of Electoral Processes (ONPE), National Jury of Elections (JNE)
Reelection (REE3): 0 "Didn't run on 2014 local elections" 1 "Didn't win on 2014 local elections" 2 "Won on 2014 local elections"	Elections of 2014	ONPE, JNE
Reelection (REE): 0 "Didn't win on 2014 local elections" 1 "Won on 2014 local elections"	Elections of 2014	ONPE, JNE
Independent variables		
Performance		
Daily trash collection service: 1 "provides service daily" 0 "otherwise"	2010-2014	National Registry of Municipalities (RENAMU)
Percentage of dropouts in primary education	2011-2014	Peruvian Ministry of Education (MINEDU)
Fiscal performance		
Percentage of expenditure financed with Transfer (Canon + FCM)	2010-2014	Peruvian Ministry of Finance (MEF)
Percentage of expenditure financed with Canon	2010-2014	MEF
Percentage of expenditure financed with FCM	2010-2014	MEF
Log of exp. per capita financed with Transfer (Canon + FCM)	2010-2014	MEF
Log of exp. per capita financed with Canon	2010-2014	MEF
Log of exp. per capita financed with FCM	2010-2014	MEF
Log of total exp. per capita	2010-2014	MEF
Log of capital exp. per capita	2010-2014	MEF
Log of current exp. per capita	2010-2014	MEF
Political variables		
Number of candidates	Elections of 2010	ONPE, JNE
Political alignment: 1 "same political party as province municipality Mayor" 0 "otherwise"	Elections of 2010	ONPE, JNE
Gender of Mayor: 0 "female" 1 "male"	Elections of 2010	ONPE, JNE
Socio-economic variables		
Log of Avg. of HH monthly exp. (n.s. per capita), 2013	2013	National Institute of Statistics and Information (INEI)
Log of Altitude (meters above sea level)	NA	INEI
Log of Territory (square kilometers)	NA	INEI

Table 3. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Independent variables					
Performance					
Daily trash collection service, 2010	1632	.3008578	0.45877	0	1
Daily trash collection service, 2011	1632	0.31495	0.46464	0	1
Percentage of dropouts in primary education, 2011	1632	3.54142	3.07981	0	39.6
Percentage of dropouts in primary education, 2013	1632	2.21103	2.02930	0	16.7
Fiscal performance					
Percentage of expenditure financed with Transfer, avg. 2012-2013	1632	68.49027	20.20906	0.56375	99.49161
Percentage of expenditure financed with Transfer, 2012	1632	70.63025	22.86505	0.93461	99.51012
Log of exp. per capita financed with Transfer, avg. 2012-2013	1632	6.46304	0.84507	2.67931	10.15982
Log of total exp. per capita, avg. 2012-2013	1632	6.94792	0.69517	4.91394	10.19311
Log of total exp. per capita, 2013	1632	6.89118	0.73748	4.83551	10.27410
Log of capital exp. per capita, avg. 2012-2013	1632	6.49117	0.88199	2.52453	10.12062
Log of current exp. per capita, avg. 2012-2013	1632	5.73667	0.58888	4.35762	8.93189
Political variables					
Number of candidates on 2010 local elections	1632	6.88052	2.66270	1	20
Political alignment	1632	0.29228	0.45495	0	1
Male	1632	0.96385	0.18673	0	1
Socio-economic variables					
Log of Household monthly exp., 2013	1632	5.90469	0.36435	4.78458	7.56783
Log of Altitude	1632	7.12771	1.58405	1.09861	8.44998
Log of Territory	1632	5.27317	1.42677	0.68813	10.08789

We consider as measures of performance (1) the frequency of trash collection, and (2) the percentage of students who drop out of primary school. In the first case, waste management is part of the targets of the 11th Sustainable Development Goals and the municipalities are responsible for waste management in their jurisdictions. In the second case, there are examples of support from municipalities to schools, and articulation of education and health services with social programs, but there is still a lack of clarity of the responsibilities of this level of government (Consejo Nacional de Educación, 2010). To test the effect of the expenditure funding sources, we consider the expenses financed with transfers. To test the effect of the expenditure components, we consider capital versus current expenditures.

Our first dependent variable is ordinal, with a value of 0 if the Mayor is not part of a recall process, 1 if the Mayor is part of the recall process but not revoked, and 2 if the Mayor is revoked. We use an Ordered logit model to analyze the effect of the covariates in the recall process. Our second dependent variable is a dummy with a value of 1 if the Mayor was reelected and 0 otherwise. We use a probit binary model to analyze the effect of the covariates in the reelection process. We develop the details of each model in the following sections.

5.1 Probability of Being Recalled

We use an ordered logit model to analyze the effect of the covariates in the recall process. As noted above, our dependent variable is $RECALL_i$, an ordinal variable with a value of 0 if the Mayor is not part of a recall process, 1 if the Mayor is part of the recall process but not revoked, and 2 if the Mayor is revoked.

$$RECALL_i = x_1\alpha + x_2\beta + x_3\delta + x_4\gamma + \eta_i \qquad 1.1$$

x_1 is a fixed matrix that includes the variables related to performance: daily provision of MSW and percentage of dropouts in primary education: $x_1\alpha = \alpha_1 MSW_i + \alpha_2 PRI_i$. x_2 is a matrix that includes the variables related to **expenditure**. Depending on how these covariates are decomposed, we consider four different models:

Model 1: natural log of total expenditure per capita considered as a single covariate and the natural log of total expenditure financed with transfers per capita, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_exp_i$;

Model 2: natural log of total expenditure per capita considered as a single covariate and the share of the expenditures finance with transfers, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_sha_i$;

Model 3: natural log of total expenditure per capita divided into current and capital expenditures and the natural log of total expenditures finance with transfers per capita, $x_2\beta = \beta_1 cu\_exp_i + \beta_2 ca\_exp_i + \beta_3 tr\_exp_i$; and

Model 4: natural log of total expenditure per capita divided into current and capital expenditures and the share of the expenditures financed with transfers, $x_2\beta = \beta_1 cu\_exp_i + \beta_2 ca\_exp_i + \beta_3 tr\_sha_i$.

x_3 is a fixed matrix that includes the **political** variables: $x_3\delta = \delta_1 alignment_i + \delta_2 gender_i + \delta_3 nro\_candidates_i$. Finally, x_4 is a fixed matrix that includes the control

variables and the intercept: $x_4\gamma = \gamma_0 + \gamma_1 householdexp_i + \gamma_2 altitude_i + \gamma_3 territory_i$.

5.2 Probability of Being Reelected

We use a probit binary model to analyze the effect of the covariates in the reelection process. Our dependent variable is reelection (REE_i), a dummy variable with a value of 1 if the Mayor is reelected and 0 otherwise.

$$REE_i = x_1\alpha + x_2\beta + x_3\delta + x_4\gamma + \upsilon_i \qquad 1.2$$

x_1 is a fixed matrix that includes the variables related to performance, daily provision of MSW and percentage of dropouts in primary education: $x_1\alpha = \alpha_1 MSW_i + \alpha_2 PRI_i$.

x_2 is a matrix that includes the variables related to expenditure. Depending on how these covariates are decomposed, we consider two different models:

Model 1: natural log of total expenditure per capita considered as a single covariate and the share of the expenditures finance with transfers, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_sha_i$; and,

Model 2: natural log of total expenditure per capita considered as a single covariate and the natural log of total expenditure finance with transfers per capita, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_exp_i$.[24]

x_3 is a fixed matrix that includes the political variables: $x_3\delta = \delta_1 alignment_i + \delta_2 gender_i + \delta_3 nro\_candidates_i$.

Finally, x_4 is a fixed matrix that includes the control variables and the intercept: $x_4\gamma = \gamma_0 + \gamma_1 householdexp_i + \gamma_2 altitude_i + \gamma_3 territory_i$.

In the previous models, we do not consider the potential sample selection bias because Mayors are likely to self-select themselves to run again or desist depending on their perceptions of winning. To take this potential source of bias into consideration, we use an ordinal dependent variable ($REE3_i$) with a value of 0 if the Mayor lost the 2014 local elections; 1 if the Mayor did

[24] We test the same four models that were used for the probability to be revoked, but not all coefficients were significant and therefore we did not include them in the analysis.

not run in the 2014 local elections; and, 2 if the Mayor was reelected. $REE3_i = x_1\alpha + x_2\beta + x_3\delta + x_4\gamma + \eta_i$ where x_1, x_2, x_3 and x_4 represent the same set of matrices introduce for the previous model.

To address the sample selection bias issue, we also use a Heckman selection model with the Mayor's affiliation to a political party (rather than other types of political organizations) as an instrumental variable.

6. Results

6.1 Probability of Being Recalled

Table 4 presents our estimates, reported as odds-ratios, of the effect of performance and expenditure outcomes on the probability of a Mayor to be revoked. In order to test the proportional odds assumption in our models, we applied the oparallel command; the outcomes confirm the relationship is proportional across all the test statistics for the four models (see results in Table 5).

Table 4. Effect of Fiscal and Policy Variables in Probability of Mayors to be Revoked (OLOGIT-odds-ratio)

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Daily trash collection service, 2010	0.719**	0.724**	0.713**	0.719**
Percentage of dropouts, primary edu., 2011	1.042**	1.041**	1.038**	1.037**
Political alignment	0.716**	0.721**	0.712**	0.714**
Mayor-Male	0.545**	0.534**	0.573*	0.567**
Number of candidates in 2010 local elections	0.917***	0.916***	0.921***	0.921***
Log of Avg. of HH monthly exp. (n.s. per capita), 2013	0.517***	0.515***	0.438***	0.437***
Log of Altitude	0.833***	0.835***	0.860***	0.857***
Log of Territory	0.901**	0.910**	0.925*	0.926*
Log of current exp. per capita, avg. 2012-2013			1.529***	1.791***
Log of capital exp. per capita, avg. 2012-2013			0.542***	0.726***
Log of total exp. per capita, avg. 2012-2013	0.514***	1.001		
Log of exp. per capita financed with Transfer, avg. 2012-2013	2.004***		1.606***	
Exp. financed with Transfer (%), avg. 2012-2013		1.015***		1.011***
Constant cut1	0.00307***	0.00971***	0.00937***	0.0144***
Constant cut2	0.0161***	0.0509**	0.0498**	0.0765*
Observations	1,632	1,632	1,632	1,632
Pseudo R2	0.0345	0.0348	0.0432	0.0441

*** p<0.01, ** p<0.05, * p<0.1. Dependent variable: Recall (CPR): 0 "Mayor was not part of a recall

process" 1 "Mayor was part of a recall process, but not revoked" 2 "Mayor was part of a recall process and revoked".

Table 5. Tests of the Parallel Regression Assumption

	Chi2	df	P>Chi2		Chi2	df	P>Chi2
Model 1				**Model 2**			
Wolfe Gould	13.11	10	0.218	Wolfe Gould	12.29	10	0.266
Brant	11.43	10	0.325	Brant	10.38	10	0.408
score	13.31	10	0.207	score	12.34	10	0.263
likelihood ratio	13.09	10	0.219	likelihood ratio	12.23	10	0.270
Wald	14.12	10	0.168	Wald	12.90	10	0.229
Model 3				**Model 4**			
Wolfe Gould	14.18	11	0.223	Wolfe Gould	13.32	11	0.273
Brant	13.59	11	0.256	Brant	11.99	11	0.364
score	16.26	11	0.132	score	14.41	11	0.211
likelihood ratio	15.72	11	0.152	likelihood ratio	14.15	11	0.225
Wald	16.99	11	0.108	Wald	14.77	11	0.193

The Coefficients of the variables of interest are significant and consistent across the four models. Both measures of performance (daily provision of garbage collection and percentage of dropouts among students in primary school) show the expected sign and are statistically significant. These results provide strong support to the hypothesis that voters reward and punish their elected local officials based on performance.

The measures of expenditure components, for their part, have differential effects on the probability of being recalled. When Mayors increase total expenses per capita, it decreases the risk of recall; this is as expected, since spending is likely associated with improved service provision. However, not all increases in spending, when we consider the different expenditure components, work the same. Increases in current expenses per capita lead to a higher probability of recall. This comports with our theoretical predictions, since current spending is more likely to be connected to inefficiencies and tends to be much less visible than capital spending. Such an effect is likely to be even greater in a system where local governments rely more fully on own-source revenues.

The political variables confirm the importance of political alignment with the upper level

of government (namely, the Mayor of the provincial municipality). Consistent with Holland and Incio (2019), the results also show a bias against women Mayors, who, other things equal, are more likely to be recalled than men. In addition, a higher number of candidates in the elections of 2010 seems to reduce the probability of a Mayor being revoked. Finally, the control variables show that more problematic geographic accessibility (measured as higher altitude and bigger territory) decreases the probability of being revoked.

6.2 Probability of Being Reelected

In the reelection process, the dependent variable is subject to a previous action made by Mayors (the decision to run for reelection), which may bias the results of a standard model. To test for this possibility, we initially run the analysis without controlling for selection bias and with the depended variable categorized as 0 if the Mayor lost on 2014 local elections; 1 if the Mayor did not run on 2014 local elections; and 2 if the Mayor was reelected (the results are shown in Table 6). We then compare the results of the ordered probit model and a multinomial probit model and compute the proportional odds assumption with a LR test. Table 7 shows evidence that the assumption of the simple model has been violated which means, not surprisingly, that the independent variables have a different impact on each level of the dependent variable.

Table 6. Effect of Fiscal and Policy Variables in Probability of Mayors to be Reelected (OPROBIT and MPROBIT estimates)

Variables	(1) oprobit-Model 1	(2) oprobit Model 2	(3) mprobit-Model 1 Didn't run	(4) Won	(5) mprobit-Model 2 Didn't run	(6) Won
Daily trash collection service, 2011	0.160**	0.161**	0.234**	0.254**	0.235**	0.253**
	(0.0645)	(0.0645)	(0.108)	(0.118)	(0.108)	(0.118)
Percentage of dropouts, primary edu., 2013	-0.0235	-0.0244*	-0.0721***	-0.0248	-0.0719***	-0.0274
	(0.0143)	(0.0143)	(0.0236)	(0.0258)	(0.0236)	(0.0258)
Political alignment	-0.000813	0.00306	0.0399	-0.0278	0.0366	-0.0178
	(0.0619)	(0.0619)	(0.103)	(0.115)	(0.103)	(0.115)
Male	0.233	0.216	0.428	0.305	0.436*	0.272
	(0.156)	(0.156)	(0.263)	(0.272)	(0.263)	(0.272)
Number of candidates In 2010 local elections	-0.0539***	-0.0557***	-0.0812***	-0.0870***	-0.0798***	-0.0906***
	(0.0116)	(0.0117)	(0.0193)	(0.0212)	(0.0195)	(0.0215)
Log of Household monthly exp. , 2013	0.239**	0.232**	0.443***	0.369**	0.446***	0.349**
	(0.0932)	(0.0932)	(0.155)	(0.167)	(0.155)	(0.167)
Log of Altitude	0.0107	0.0140	0.265***	-0.0362	0.261***	-0.0308
	(0.0216)	(0.0219)	(0.0380)	(0.0377)	(0.0384)	(0.0380)
Log of Territory	0.0268	0.0323	0.0605*	0.0399	0.0555	0.0508
	(0.0218)	(0.0220)	(0.0365)	(0.0392)	(0.0369)	(0.0395)
Log of total exp. per capita, 2013	0.120***		-0.0490	0.250***		
	(0.0411)		(0.0692)	(0.0742)		
Exp. financed with Transfer (%), 2012	-0.00284**		0.00131	-0.00579**		
	(0.00129)		(0.00218)	(0.00231)		
Log of total exp. per capita, avg. 2012-2013		0.220***			-0.143	0.429***
		(0.0727)			(0.125)	(0.126)
Log of Exp. per capita financed with Transfer, avg. 2012-2013		-0.135**			0.106	-0.252**
		(0.0628)			(0.109)	(0.108)
Constant cut1	1.923***	1.939***				
	(0.700)	(0.707)				
Constant cut2	2.979***	2.994***				
	(0.702)	(0.708)				
Constant			-4.496***	-3.794***	-4.410***	-3.746***
			(1.171)	(1.257)	(1.181)	(1.271)
Observations	1,632	1,632	1,632	1,632	1,632	1,632
Pseudo R2	0.0150	0.0143				

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: REE3 (0=didn't run; 1=Run but lost; 2=Run and won).

Table 7. Testing the Proportionality of Odds Assumption Using the Likelihood Ratio Test

Variables	(1) Omodel Model 1	(2) Omodel Model 2
Daily trash collection service, 2011	0.160**	0.161**
	(0.0645)	(0.0645)
Percentage of dropouts,	-0.0235	-0.0244*
primary education, 2013	(0.0143)	(0.0143)
Political alignment	-0.000813	0.00306
	(0.0619)	(0.0619)
Male	0.233	0.216
	(0.156)	(0.156)
Number of candidates in 2010	-0.0539***	-0.0557***
local elections	(0.0116)	(0.0117)
Log of Avg. of HH monthly exp.	0.239**	0.232**
(n.s. per capita), 2013	(0.0932)	(0.0932)
Log of Altitude	0.0107	0.0140
	(0.0216)	(0.0219)
Log of Territory	0.0268	0.0323
	(0.0218)	(0.0220)
Log of total exp. per capita, 2013	0.120***	
	(0.0411)	
Exp. financed with Transfers (%), 2012	-0.00284**	
	(0.00129)	
Log of total exp. per capita,		0.220***
avg. 2012-2013		(0.0727)
Log of Exp. per capita financed		-0.135**
with Transfer, avg. 2012-2013		(0.0628)
Cut1	1.923***	1.939***
	(0.700)	(0.707)
Cut2	2.979***	2.994***
	(0.702)	(0.708)
Observations	1,632	1,632
Pseudo R2	0.0150	0.0143
Approximate likelihood-ratio test of equality of coefficients across response categories	chi2(10) = 97.74 Prob > chi2 = 0.0000	chi2(10) = 99.45 Prob > chi2 = 0.0000

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: REE3 (0=didn't run; 1=Run but lost; 2=Run and won).

The results of the effect of performance and expenditure on the probability of a Mayor to be reelected can be seen in Table 8. In the first two columns, we present for comparison the results of the probit model without correcting the selection bias. The second two columns contain our primary, correct Heckman probit model.[25]

[25] The results for the interest equation are on the top of the table and the selection equation are at the bottom.

Table 8. Effect of Fiscal and Policy Variables on Probability of Mayors to be Reelected – (PROBIT and HECKMAN Estimates)

Variables	(1) probit- Model 1	(2) probit Model 2	(3) heckprobit Model 1	(4) heckprobit Model 2
Daily trash collection service, 2011	0.183*	0.182*	0.110**	0.105**
	(0.0955)	(0.0954)	(0.0531)	(0.0530)
Dropouts, primary edu. (%), 2013	-0.0163	-0.0188	-0.0144	-0.0161
	(0.0205)	(0.0205)	(0.0113)	(0.0112)
Political alignment	-0.0296	-0.0203	-0.0151	-0.00982
	(0.0931)	(0.0930)	(0.0497)	(0.0500)
Male	0.215	0.189	0.0915	0.0916
	(0.211)	(0.211)	(0.104)	(0.105)
Number of candidates in 2010 local elec.	-0.0654***	-0.0679***	-0.0376***	-0.0376***
	(0.0169)	(0.0172)	(0.00817)	(0.00826)
Log of Avg. of HH monthly exp. per capita, 2013	0.281**	0.268**	0.189**	0.180**
	(0.131)	(0.131)	(0.0738)	(0.0731)
Log of Altitude	-0.0424	-0.0371	-0.0278	-0.0233
	(0.0301)	(0.0303)	(0.0182)	(0.0182)
Log of Territory	0.0289	0.0384	0.0185	0.0240
	(0.0313)	(0.0315)	(0.0179)	(0.0178)
Log of total exp. per capita, 2013	0.209***		0.133***	
	(0.0594)		(0.0339)	
Exp. financed with Transfer (%), 2012	-0.00470**		-0.00240**	
	(0.00183)		(0.00102)	
Log of total exp. per capita, avg. 2012-2013		0.364***		0.219***
		(0.0998)		(0.0576)
Log of exp. per capita financed with Transfer, avg. 2012-2013		-0.217**		-0.120**
		(0.0859)		(0.0523)
Constant	-2.910***	-2.886***	-1.418**	-1.422**
	(0.985)	(1.000)	(0.578)	(0.585)
Selection equation (likely to run for reelection)				
Run for 2010 local elections with a political party			0.170***	0.169***
			(0.0497)	(0.0498)
Constant			0.259***	0.259***
			(0.0352)	(0.0353)
Rho				
Constant			-5.566	-5.303
			(788.926)	(78.193)
Observations	1,020	1,020	1,632	1,632
Pseudo R2	0.0408	0.0378		
Wald test of indep. eqns. (rho = 0): chi2(1) =			10.07	9.03
Prob > chi2 =			0.0015	0.0026

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: REE (0=Lost on 2014 local elections 1=Won on 2014 local elections).

Both measures of performance show the expected directional impact on the probability of

being reelected, but only the first one (waste collection) is significant. This provides fairly strong evidence for our hypotheses. From the measures of expenditure based on its components, the total expenditure per capita has a significant and positive effect on the probability of being reelected, but in this case we did not find different effects based on the recurrent versus capital components. Finally, a higher number of candidates in the elections of 2010 seems to reduce the probability of a Mayor of being reelected. The rest of the political and control variables were not statistically significant.

The only result which runs counter to our expectations concerns the political impact of financing expenditures with vertical transfers. Surprisingly, increased transfer financing (controlling for total expenditures) reduces the probability that local leaders will be reelected and increases the probability that they will be recalled. We speculate that perhaps this unanticipated result indicates that the ability of local authorities to raise own-source revenue, and thus have a reduced reliance on transfers, is associated with higher levels of overall performance and therefore also higher levels of political popularity.

7. Conclusions

In this paper, we consider whether individual voters use rational performance criteria to hold their local leaders to account. Accountability is a critical benefit of democracy, and it is also among the central justifications for decentralization. Indeed, without accountability, it would be difficult to justify the devolution of authority to elected local governments.

Despite this fact, however, few studies have documented the existence of local accountability in a systematic and empirically rigorous fashion. We attempt to do that here with a comprehensive empirical analysis of Peruvian municipalities. The advantage of using a country case study is that we incorporate the explanatory effect of the variability within the country to

analyze the presence of electoral accountability from the perspective of the voter. This paper focuses on two mechanisms of electoral accountability: recalls and elections. Even though both mechanisms follow a similar structure, recalls allow the removal of elected representatives before the end of their regular terms and have proven more controversial in the literature as an effective instrument for enhanced accountability.

Our empirical tests show clearly that local accountability is functioning in Peru. The probability of reelection and recall are both linked to government performance indicators on waste disposal and education, and are also associated with the type and level of expenditures. More specifically, we find that government performance is especially important in a Mayor's probability of being recalled, though it also matters for reelection. Other things equal, increasing total expenses per capita reduces recall and increases reelection. We also find that voters even pay attention to expenditure components, favoring capital spending, at least in the case of recalls.

Of course, the local accountability system in Peru, as elsewhere, is unlikely to be perfect. Recalled Mayors, for example, sometimes run again and are elected, and the recall system itself is likely subject to political abuse. The system also shows a bias against woman Mayors. That said, our results are encouraging for those who support local elections, as they indicate that voters use their democratic tools, at least to some degree, rationally and effectively. This means that one of the vital preconditions for the benefits of decentralization appears to be met in the case of Peru.

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Appendix

Table A1. Types of Performance Measures

Type	Definition	Example
Inputs	Measures of financial and nonfinancial resources that are applied when providing services.	The amount spent on road maintenance or the amount spent on serious crime investigations.
Process /Activity	Measures of regular activities conducted within the organization.	The number of applications processed.
Outputs	Measures of the number of services provided or the quantity of service that meets a certain quality requirement.	The number of lane miles of road repaired or the number of serious crimes reported.
Outcomes	Measures of the results that occur, at least in part, because of services provided. This may include initial, intermediate, or long-term outcomes.	The percentage of lane miles of road maintained in excellent, good, or fair condition or the clearance rate for serious crimes, or the percentage of residents rating their neighborhood as safe or very safe.
Cost /Efficiency	Measures of the resources used, such as the cost per unit of output or outcome.	The cost per lane mile or road repaired or the cost per serious crime investigated or per arrest for a serious crime.
Quality /Customer Satisfaction	Measures of the quality of the outputs/outcomes and assessment of the quality of the service/program by stakeholders.	The extent to which customers are satisfied with an aspect of service delivery.
Explanatory	Relating to factors other than the services being provided that may have affected the reported performance.	The percentage of trucks in vehicle traffic or the unemployment rate in the community.
Benchmarks	The comparison of performance data to other similar entities or timeframes.	Comparing a particular performance measure of one of your state programs with that same measure from a similar program of another state government.

Source: (Melkers & Willoughby, 2005; Willoughby, 2004)

Table A2. Number and Population of District Municipalities, 2007-2015

Year	Number of district municipalities	Population (average)	Population (standard deviation)	Minimum district population	Maximum district population
2007	1,639	12,677	43,776	188	922,833
2008	1,639	12,849	44,644	186	942,619
2009	1,639	13,021	45,531	185	962,554
2010	1,643	13,184	46,398	184	983,095
2011	1,643	13,363	47,304	182	1,000,000
2012	1,643	13,533	48,019	181	1,000,000
2013	1,647	13,777	48,805	180	1,000,000
2014	1,655	13,991	50,712	178	1,100,000
2015	1,658	14,155	51,424	177	1,100,000

Source: National Institute of Statistics and Informatics (INEI)

Table A1. Number of Lists that Competed in Local Elections, by Election Year

	1998	2002	2006	2010
More than 17		0.8%	0.4%	0.3%
Between 11 and 17	2.2%	18.3%	9.6%	10.8%
Between 6 and 10	31.6%	62.4%	57.3%	58.2%
Less than 6	66.2%	18.5%	32.7%	30.6%
Number of municipalities	1,811	1,834	1,834	1,834
Total lists	7,690	14,965	12,747	13,052

Source: (INFOGOB-JNE)

Table A2. Recall Processes in Peruvian Local Governments from 1997 to 2013

	1997	2001	2004	2005	2008	2009	2012	2013
Number of recall processes								
Provincial municipalities	1	1	1		3		4	1
District municipalities	60	172	187	21	242	72	266	126
Authorities								
Mayors								
Part of the process	61	166	187	19	240	67	264	591
Revoked	42	11	29	11	95	22	69	188
Councilmen								
Part of the process	129	462	691	75	999	271	1040	42
Revoked	93	27	109	42	444	132	400	25

Source: (ONPE, 2013b)

Table A3. Local Government Expenditures as a Percent of GDP, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Current expenditures	1.45	1.37	1.30	1.42	1.56	1.72	1.72	1.69	1.89	1.84	1.82
Capital expenditures	0.91	0.91	1.33	1.34	2.08	2.54	2.40	1.86	2.45	2.63	2.45
Debt service	0.16	0.17	0.11	0.06	0.07	0.07	0.09	0.04	0.06	0.07	0.06
Total	2.52	2.45	2.73	2.82	3.70	4.33	4.22	3.60	4.40	4.54	4.32

Source: Ministry of Finance.

Table A6. Per Capita Spending by Type of Municipality, 2009-2014 (in New Sols of 2014)

	2009	2010	2011	2012	2013	2014
Provincial municipality[1]						
Max	21,868	36,157	17,243	21,866	21,850	20,845
Min	183	232	255	331	314	353
CoV	1.48	2.01	1.25	1.20	1.09	1.05
# of province municipalities	195	195	195	195	195	195
District municipality						
Max	25,825	45,829	37,291	24,815	29,913	33,122
Min	120	122	110	137	130	128
CoV	1.18	1.58	1.31	1.12	1.29	1.18
# of district municipalities	1,622	1,626	1,632	1,637	1,637	1,637

Source: Ministry of Finance.

[1] The amounts are divided by the population of the provincial municipality's district.

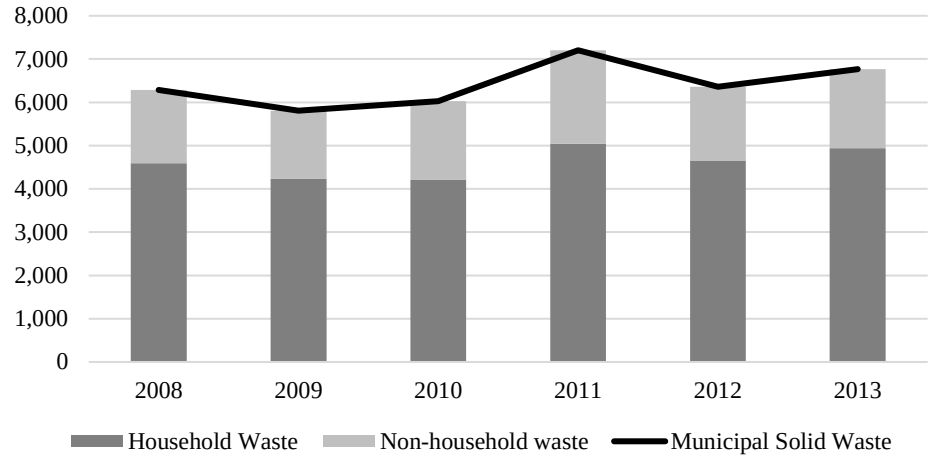
Table A4. Allocation of Responsibilities by Level of Government

	Exclusive	Shared
Central	Foreign relations · Defense, national security, and armed forces · Justice, except Justice administration · Internal order, national and border police · The tax administration of national scope and national public borrowing · Foreign trade and tariff policy ·Regulation of merchant marine and commercial air transport · Regulation of public services · Regulation of public infrastructure of national scope · Any others set by law by the Constitution · Design and supervision of national and sectoral policies, which are compulsory for all levels of government	All other responsibilities
Regional	Regional development plans and executing corresponding socio-economic programs · The internal organization of the regional government · Promote and implement public investment of regional scope in roads, communications, and basic services · Development of tourism circuits · Administer state land within their jurisdiction (except municipal land) · Demarcation of territorial limits within the region · Modernization of small and medium enterprises · Promote sustainable use of forestry and biodiversity resources	Education: management of education services for pre-school, primary, secondary, and higher education (except university) · Public health · Regulation of economic activities in their sphere · Sustainable management of natural resources and improving the environment · Preserving and administering regional natural reserves · Culture and arts · Regional competitiveness and job promotion · Citizens' participation

Local	Urban and rural municipal development · Management and regulation of local public services · The internal organization of the local government · Local development planning · Execution and monitoring of local public infrastructure	Education: take part in management of education services as would be determined in the sectoral law · Public health · Culture, tourism, recreation, and sports · Security (*seguridad ciudadana*) · Monument conservation · Public transport and traffic · Housing and urban rehabilitation · Service and management of social programs · Management of social programs · Waste management

Source: (World Bank, 2010b)

Figure A1. Municipal Solid Waste Generation, 2008-2013 (in Thousands of Tons per Year)



Source: MINAM-SIGERSOL

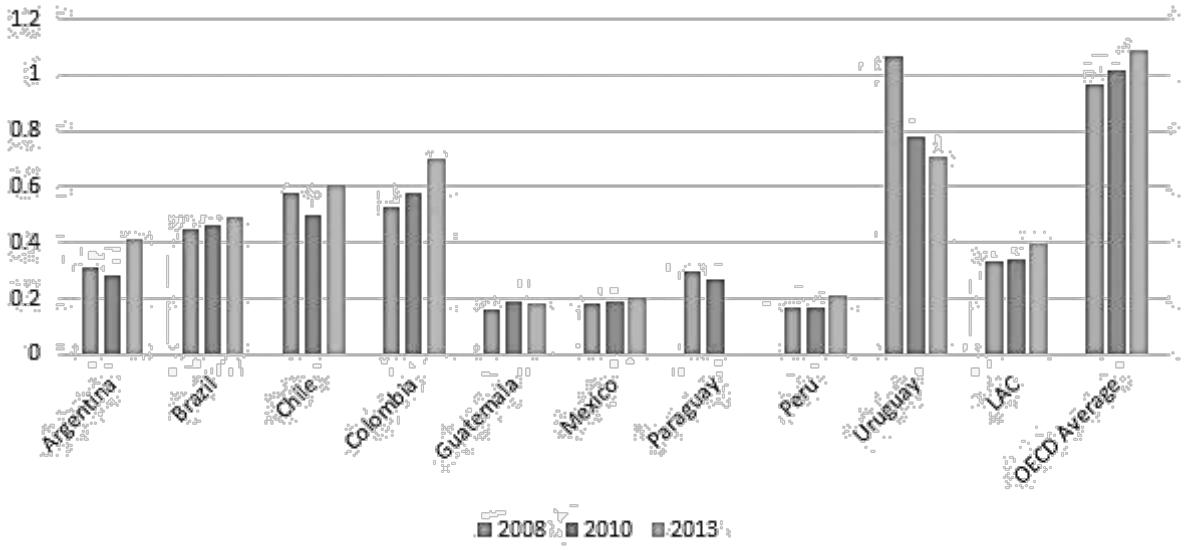
Table A5. Main Characteristics of Municipal Tax Revenue Assignments

	Revenue shares		Tax rates
	Districts	**Provinces**	
District administration:			
Land and buildings	100% (5% for cadaster maintenance)	0%	< 15 UIT: 0.2% (or 0.6%) 15-60 UIT: 0.6% > 60 UIT: 1.0%
Property transfers	50%	50% (to Municipal Investment Fund)	3% (first 3 UIT exempted)
Games (pinball, bingo, etc.)	100%	0%	10%
Public shows	100%	0%	Bullfighting: 5% Horse racing: 10% Others: 15%
Provincial administration:			
Vehicle property	0%	100%	1% (minimum: 1.5% UIT)
Bets	40%	60%	20% (horse racing: 12%)
Games (lotteries)	0%	100%	10%

Notes: The Law Decree No. 776 establishes taxes on the property as the main tax revenue sources for municipalities. There is also a set of national taxes that correspond to the municipalities but are collected by the central government which later transfer to them. UIT or "Tributary Tax Unit" is a monetary measure used to set the value of taxes, fees, penalties, and

other legal payments equivalent to 3,950 new soles in 2016 (US$ 1,170 on December 24, 2015).
Source: Gomez, Martinez-Vazquez, & Sepulveda (2010).

Figure A2. Property Tax to GDP Ratio, Peru and Selected Comparators



Note: We are comparing the component "4100-Recurrent taxes on immovable property."
Source: (OECD).

Table A6. Revenue Composition of Local Governments, 2004-2014 (as a percent of GDP)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Own revenues	0.91	0.91	0.74	0.84	0.91	0.97	0.88	0.88	0.95	0.93	0.89
Property tax[1]	0.23	0.25	0.22	0.30	0.32	0.33	0.34	0.35	0.39	0.41	0.39
Other tax	0.06	0.05	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.06	0.05
Nontax	0.62	0.61	0.48	0.50	0.54	0.58	0.49	0.48	0.51	0.47	0.44
Transfers	1.47	1.65	1.78	2.73	2.66	2.08	2.29	2.52	2.60	2.35	2.19
Canon[3]	0.38	0.66	0.91	1.71	1.53	1.17	1.14	1.37	1.50	1.26	1.08
FCM	0.76	0.79	0.81	0.86	0.92	0.82	0.78	0.80	0.82	0.82	0.86
Other	0.33	0.20	0.05	0.16	0.22	0.09	0.37	0.35	0.28	0.28	0.25
Capital revenues[4]	0.15	0.08	0.10	0.09	0.11	0.21	0.24	0.15	0.21	0.17	0.31
Total	2.53	2.64	2.62	3.67	3.68	3.27	3.41	3.56	3.75	3.45	3.39

[1] includes vehicle property, property transfer and land, and buildings property.
[2] Includes fees, rental of property, service charges, sales of goods, fines, and others.
[3] includes canon, sobrecanon, royalties, customs duties, and concession rights.
[4] Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table A10. Distribution Procedure for the Revenues from Canon

Share	Beneficiaries	Distribution Criteria
10%	District municipalities within which the natural resources are exploited	Equal share
25%	Municipalities of the province within which the natural resources are exploited	Population and Unmet Basic Needs
40%	Municipalities of the region within which the natural resources are exploited	Population and Unmet Basic Needs
25 %	80% to Regional Government of the region, and 20% to the universities in the region	

Notes: The criteria apply to the revenues collected from the exploitation of mining, gas, hydro-energetic, fishing and forest resources (excludes oil canon). The oil canon is governed by different rules for the areas of Loreto, Ucayali, Piura, Tumbes, and Huánuco.
Source: (Canavire-Bacarreza, Martinez-Vazquez, & Sepulveda, 2012) and Law No. 27506 (Law on the Canon).

Table A11. Revenue Structure of Local Governments, 2004-2014 (as Percent)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Own revenues	36	34	28	23	25	30	26	25	25	27	26
Property tax[1]	9	9	8	8	9	10	10	10	10	12	12
Other tax	2	2	1	1	1	2	1	1	1	2	2
Nontax	24	23	18	14	15	18	14	14	14	14	13
Transfers	58	63	68	75	72	64	67	71	69	68	65
Canon[3]	15	25	35	47	41	36	33	39	40	36	32
FCM	30	30	31	24	25	25	23	22	22	24	25
Other	13	8	2	4	6	3	11	10	8	8	7
Capital revenues[4]	6	3	4	3	3	6	7	4	5	5	9
Total	100	100	100	100	100	100	100	100	100	100	100

[1] includes vehicle property, property transfer and land, and buildings property.
[2] Includes fees, rental of property, service charges, sales of goods, fines, and others.
[3] includes canon, sobrecanon, royalties, customs duties, and concession rights.
[4] Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table A12. Own Revenue per Capita by Type of Municipality (in New Sols of 2014)

	2009	2010	2011	2012	2013	2014
Provincial municipalities[1]						
Max	2,822	3,328	3,695	4,428	3,823	3,589
Min	3	3	3	0	5	0
St. Dev	247	276	299	361	404	366
Average	118	129	131	146	173	165
CoV	2.09	2.14	2.28	2.47	2.34	2.22
# of provincial municipalities	195	195	195	195	195	195
District municipalities						
Max	5,414	4,766	2,566	2,954	2,995	3,182
Min	0	0	0	0	0	0
St. Dev	223	243	183	193	215	219
Average	75	85	81	86	95	95
CoV	2.96	2.86	2.26	2.25	2.27	2.31
# of district municipalities	1,637	1,637	1,637	1,637	1,637	1,637

[1] The amounts are divided by the population of the districts where the provincial municipality is located.

Source: Ministry of Finance.

Table A13. Tax Revenue per Capita by Type of Municipality (in New Sols of 2014)

	2009	2010	2011	2012	2013	2014
Provincial municipalities[1]						
Max	1,398	1,794	1,963	2,362	2,527	2,418
Min	0	0	0	0	0	0
St. Dev	103	133	146	176	245	223
Average	26	32	35	41	55	53
CoV	4.01	4.11	4.13	4.35	4.45	4.20
# of province municipalities	195	195	195	195	195	195
District municipalities						
Max	5,039	4,642	1,206	1,435	1,512	1,620
Min	0	0	0	0	0	0
St. Dev	138	156	73	79	93	93
Average	16	21	18	19	22	22
CoV	8.50	7.49	4.11	4.14	4.24	4.26
# of district municipalities	1,637	1,637	1,637	1,637	1,637	1,637

[1] The amounts are divided by the population of the districts where the provincial municipality is located.

Source: Ministry of Finance.

Table A14. Non-Tax Revenue per Capita by Type of Municipality (in New Sols of 2014)

	2009	2010	2011	2012	2013	2014
Provincial municipalities[1]						
Max	1,425	1,534	1,732	2,066	1,855	1,347
Min	2	2	2	0	4	0
St. Dev	171	173	174	219	227	194
Average	92	97	95	106	118	112
CoV	1.85	1.78	1.82	2.07	1.93	1.74
# of province municipalities	195	195	195	195	195	195
District municipalities						
Max	2,958	3,218	2,193	2,458	2,020	2,338
Min	0	0	0	0	0	0
St. Dev	146	160	138	145	152	157
Average	59	64	63	67	73	73
CoV	2.47	2.49	2.19	2.17	2.09	2.16
# of district municipalities	1,637	1,637	1,637	1,637	1,637	1,637

[1] The amounts are divided by the population of the provincial municipality's districts.
Source: Ministry of Finance.

Table A15. Characteristics of Local Governments Own Revenues, 2014

Variables	(1) Log of Total own revenue per capita	(2) Log of Tax revenue per capita	(3) Log of Non-tax revenue per capita
Log of average household spending per capita, 2013	1.782***	2.334***	1.477***
	(0.121)	(0.0962)	(0.121)
Producing Districts	0.853***	0.210**	0.893***
	(0.116)	(0.0919)	(0.116)
Provincial municipality	0.213*	0.644***	0.228**
	(0.110)	(0.0874)	(0.110)
Lima province	0.919***	0.927***	0.909***
	(0.229)	(0.182)	(0.229)
Urban rate (%)	0.00984***	0.00454***	0.00909***
	(0.00145)	(0.00115)	(0.00145)
Log of Area (square kilometers)	0.163***	0.0320	0.170***
	(0.0254)	(0.0201)	(0.0254)
Log of Altitude (meters)	0.127***	-0.210***	0.193***
	(0.0235)	(0.0186)	(0.0235)
Constant	-9.448***	-11.44***	-8.316***
	(0.785)	(0.622)	(0.786)
Observations	1,843	1,843	1,843
R-squared	0.308	0.578	0.248

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variables are express in log. The US Dollar to Peruvian new sols exchange rate on December 2014 was as 1 USD = 2.9798 new sols.
Source: Ministry of Finance, INEI

Table A16. Equalization Goals, Allocation Factors and International Practice

Goals	Factors	Country examples
Enable similar levels of service affordability	Expenditure needs indicators (separately or in a combined indicator), or national expenditure standards	India, Italy, Nigeria's Federation Account, South Africa's Equitable Shares, Spain, Uganda's Unconditional Grant.
Enable similar levels of fiscal resource availability	Fiscal capacity indicators or representative revenue system	Canada's Equalization Grant.
Enable similar levels of service at similar levels of taxation	Fiscal gap = Expenditure needs – Fiscal capacity, or some other combination of needs and capacity	Australia, China, Germany, Indonesia, Japan, Korea, Latvia, Russia, UK, Netherlands' Municipal Fund, Uganda's Equalization Grant.
Distribution on an equal per capita basis	Population	Some transfers in Canada, Ecuador, Estonia, Germany, Hungary, and England.

Source: Boex & Martinez-Vazquez (2007)

Table A17. Estimation of per Capita Total Revenues per District

Variables	IPpc_k
Gtoavgpck	0.563***
	(0.0286)
Constant	-129.6***
	(12.69)
Observations	1,819
R-squared	0.176

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1