5-1-2018

Essays on Electoral Accountability and Equalization Transfer under a Decentralized Context: The Case of Peruvian Municipalities

Linda Porras Mendoza

ABSTRACT

ESSAYS ON ELECTORAL ACCOUNTABILITY AND EQUALIZATION TRANSFER UNDER A DECENTRALIZED CONTEXT: THE CASE OF PERUVIAN MUNICIPALITIES

BY

LINDA JANET PORRAS-MENDOZA

MAY, 2018

Committee Chair: Dr. Jorge Martinez-Vazquez

Major Department: Public Management and Policy

This dissertation consists of two essays that examine the efficiency and equity implications of a particular fiscal decentralization system. Both essays have the Peruvian local governments as their unit of analysis.

The first essay investigates how accountability takes place in local governments in a decentralized context. Accountability can refer to different concepts. In this essay we focus on the effects of fiscal and policy variables on electoral outcomes. Theoretically, one of the benefits of decentralization is the higher accountability that arises when subnational governments are responsible for providing goods and services in their jurisdictions and when they finance those goods and services with their own revenues. It is expected that this framework will increase the interest of citizens in the performance of their elected authorities, as well as the concern of elected authorities in their performance motivated by their expectations of being reelected or being revoked.

The second essay examines the nature of fiscal disparities among local governments under a decentralized context and the role played by equalization transfers. One of the

challenges in a decentralized context is to determine a transfer system with equity criteria; meaning giving support to those jurisdictions that have low fiscal capacity and higher expenditure needs, but without discouraging them to generate their own revenues or incur into excessive spending. An important task to deal with this challenge is finding the right measures of fiscal capacity and expenditure needs, and setting guidelines for how to include them in the transfer system formula. The effect of including fiscal capacity and expenditure needs measures in the design of equalization transfers could provide a strategy to reduce existing fiscal disparities. We propose an alternative allocation methodology that includes a measure of fiscal capacity in the current Peruvian equalization transfer and compare it with the current formula by identifying the changes in the disparities before and after the proposed reform.

ESSAYS ON ELECTORAL ACCOUNTABILITY AND EQUALIZATION TRANSFER UNDER A DECENTRALIZED CONTEXT: THE CASE OF PERUVIAN MUNICIPALITIES

BY

LINDA JANET PORRAS-MENDOZA

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
of
Doctor of Philosophy
in the
Andrew Young School of Policy Studies
of
Georgia State University

GEORGIA STATE UNIVERSITY
2018

ACCEPTANCE

This dissertation was prepared under the direction of Linda Janet Porras-Mendoza's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Public Policy in the Andrew Young School of Policy Studies of Georgia State University.

Dissertation Chair:	Dr. Jorge L. Martinez-Vazquez
Committee:	Dr. Charles R. Hankla
	Dr. Andrey Timofeev
	Dr. Sally Wallace
	Dr. Katherine G. Willoughby

Electronic Version Approved:

Sally Wallace, Dean
Andrew Young School of Policy Studies
Georgia State University
May, 2018

ACKNOWLEDGEMENT

I would like to extend my gratitude first and foremost to my thesis advisor for mentoring me. He has helped over the course of the analysis and the writing of the dissertation and for that I sincerely thank him for his confidence in me. I would additionally like to thank the members of my Committee for their incredible support in both the research and especially the revision process that has led to this document.

I would like to extend my deepest gratitude to my loved ones without whose support and encouragement I could have never completed this doctoral degree.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The expression “One size fits all?” has frequently been used to question the risks of generalizing policies across countries. It is the constant reminder that policies need to adjust to the political and social context of the unit of analysis. Our interest in this dissertation is on fiscal decentralization, which is one of those cases where adjustment to the political and social context is of special importance.

The main goal pursued with fiscal decentralization is to improve efficiency in the provision of public goods by transferring power to lower levels of government and to citizens. The outcome of improved efficiency depends critically on local government officials being more accountable to citizens in the provision of local services than central authorities. That is, the expectation that citizens will care and react to government’s actions and that in turn, governments will strive harder to satisfy the needs and preferences of citizens.

And yet local government accountability is a subject that has been extensively studied, but with largely inconclusive results. In large measure the problem lies in that the concept of accountability itself is viewed differently comprising different kinds of institutions and strategies. Most importantly, there is still a lack of a general framework that can be used to test or predict the impact or influence of accountability on important processes and policies, including fiscal decentralization.

Another potential reason for the diversity of results in the case of the role played by accountability on fiscal decentralization outcomes comes from the methodological limitations of studies using across countries panel data. These studies allow us to test general aspects of the structure of the general government. But they are limited in what economic variables can be used to measure outcomes because the necessary information

does not exist at a sufficient disaggregated level. Also, cross country studies are limited in how much they can say about the dynamic changes that take place in a country when a policy such as decentralization is implemented. Specific single country studies can offer a rich alternative to disentangle the interaction between accountability and decentralization outcomes.

A second important goal pursued with fiscal decentralization is to increase equality for access to public service delivery among residents of different subnational units. Here the main difficulty typically lies in the measurement of the expenditure needs and revenue capacity of the subnational governments. Here again "one size may not fit all" because countries differ very significantly in geographic conditions, developments levels or abundance and distribution of natural resources across subnational units. And even though much useful work has been done on the issues of how best equalize across subnational units using cross country data, it is again the case that more can be learned by using disaggregated data for specific country case studies, especially if those countries are characterized by significant diversity among subnational governments.

In this dissertation we study the two issues of: (i) how decentralization, reflected in the share of expenses financed with local revenues and policy outcomes, affects electoral outcomes and (ii) how best design interjurisdictional equalization mechanisms in the presence of considerable subnational diversity, by using data from Peru. The reasons why is interesting to study a country like Peru are twofold: First, decentralization and electoral accountability mechanisms have been well established at all subnational levels (regional and local). Second, Peru shows a great diversity of conditions across local jurisdictions. This diversity comes from its complex geography, the extremely uneven distribution of significant endowments of natural resources, and from an administrative structure that is

characterized by a great level fragmentation. In this study we focus on local governments – as opposed to regional governments -- since they have received more responsibilities and revenue resources, and the one level that has more significantly used the existing accountability mechanisms.

Both papers seek to contribute to the practice of decentralization. We hope that the study of these two main sets of issues -the role of decentralization in accountability and how to equalize resources in the presence of great subnational diversity- will shed light on these issues and provide insight that will be useful to academic researchers and policymakers.

1 Electoral accountability under a decentralized context

1.1 Introduction

The discussion about fiscal decentralization and accountability has been vast: from their definitions, the factors that influence their success, among others. However, despite the amount of research, there are still issues concerning both decentralization and accountability that require further clarification. In the case of fiscal decentralization, there has been a lot of discussion about the criteria to assigned expenditure responsibilities among levels of governments, but there is still a lack of a general theory of revenue assignments, which in turn affects the types of accountability mechanisms available. In the case of accountability, several mechanisms have been promoted with the expectation that they will enhance public policy and administration decisions by allowing citizens to take an active role in shaping actual policies. But it remains unclear how the effectiveness of these mechanisms can be measured.

More important to us in this essay, there are still questions about how the two constructs of fiscal decentralization and accountability relate to each other. Considering the complexity of fiscal decentralization and accountability, it is important to set the scope of our analysis. In the case of decentralization, the essay focuses on the role played by intergovernmental transfers by testing the impact of fiscal and policy variables on electoral outcomes. In the case of accountability, we focus on two types of accountability mechanism that takes place through the electoral system. Understanding the dynamic between fiscal and policy variables with electoral outcomes have mostly been the focus on the central level of government, our essay contributes to the literature by investigating these processes among local governments.

The structure of this essay is as follows. Section 1.2 presents the literature review and the testable hypotheses used in our empirical analysis. Section 1.3 describes the main characteristics of Peruvian local governments. Section 1.4 describes the data and the empirical methodology. Section 1.6 presents the results. Section 1.7 concludes.

1.2 Review of the literature and the basic theoretical framework

1.2.1 Electoral Accountability

Accountability institutions aim to improve the efficiency of public spending by encouraging public officials to design and deliver public services according to the demands and needs of their citizens, and by giving citizens a role in the decision-making process.[1] Its importance, as described by Bovens (2005), relies on the role it plays in enhancing the legitimacy of public governance by allowing democratic control and improving government performance. The focus of our essay is the accountability that takes place through the electoral system (electoral accountability).[2]

The literature uses different approaches to define the presence of electoral accountability. Some scholars consider the reelection (or no reelection) of elected public officials, based on their performance, as evidence of accountability.[3] Others consider that any form of reward or punishment regarding electoral outcomes is a sufficient indicator of accountability.[4] We consider the former approach to define electoral accountability.

Elections are not the only mechanism of direct democracy that allows voters to express approval or disapproval of government performance.[5] Direct recalls allow a specified number of citizens to demand a vote for the electorate on whether elected officials should be removed from office before the end of their term. There are similarities between elections and recalls;

[1] The term accountability can refer to different concepts: the type of compliance; the mechanism set to enforce compliance; the expected outcomes and citizens reaction to government performance (Rubin, 1996).
[2] In this essay, we use the term "Electoral Accountability" and "Accountability'' indistinctly and we take the outcome of reelection and revoked as measures of accountability.
[3] Seabright (1996) defines accountability as the probability that a region will be able to choose to elect or reject a government purely according to its own view of the government's performance.
[4] Samuels (2010) considered different measures of electoral accountability: change in vote share for the incumbent party; change in seat share of the incumbent party; change in government status, if the incumbent party retains control of the executive; and, change in partisan control of the national executive. Gélineau (2013) used, as a measure of economic vote, the individual evaluations of the incumbent and vote intention for the incumbent party. Previously they used the percentage vote received in the subnational election by the President's party (Gélineau & Remmer, 2006). Other studies used citizens' perceptions of government (Escobar-Lemmon & Ross, 2014).
[5] Direct democracy is the decision making process in which the vote of citizens has a direct influence on the contents of laws. It includes a broad range of different institutional mechanisms, such as referendum, plebiscites, recalls, or popular initiatives (Altman, 2002; Feld & Savioz, 1997).

they are both regularized means for citizens to reward or sanction elected public officials (Timmons & Garfias, 2015). However, recalls allow to remove elected representatives before the end of their regular term and voters are in charge of collecting the signatures to initiate the recall process. Its activation is expected to be more frequent in contexts of political distrust in the government's performance (Bowler, 2004).

Some of the theoretical frameworks used to study electoral accountability are the principal-agent problem and the economic voting theory. According to the principal-agent problem, the principal (voters) delegates to the agent (elected officials) a set of instruments to execute certain goals. The problem arises because the interests of the principal and the agent may be different, which can create inefficiencies and corruption (Adsera, Boix, & Payne, 2003).[6] In the context of economic voting theory, voters punish or reward incumbent parties and public officials for their relative success in managing the economy through their vote (Lewis-Beck & Nadeau, 2011). Elections should make public officials accountable to the public and the threat of losing office in the next period compels public officials to deliver good services and refrain from extracting rents (Barro, 1973).[7]

However, comparative politics scholars have repeatedly found substantial variation in economic voting across countries, over time, and even within countries over time. There are empirical findings that show how voters make choices including factors beyond the governments' performance (Carlin & Singh, 2015). Voters could fail to impose sanctions because they do not have the resources or skills to evaluate the performance of public officials or to properly assign the responsibility (Anderson, 2007; Bardhan & Mookherjee, 2006). There

[6] Elected officials may be interested in pursuing their own agenda like enriching themselves while in office; or, even if they are honest, providing goods and services that differ from what the public wants.
[7] The process of the individual vote choice is determined by the retrospective and prospective evaluation of candidates; and, 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 the prospective evaluation, voters' beliefs about the future performance of the economy influence their vote.

is also the case that what is perceived as voters' active role it actually reflects political instability or power of the local elites (Bardhan, 2002).

There are also concerns about the effectiveness of the accountability mechanisms. Even though elections and recalls are important control mechanisms, they may not be sufficient to cause improved accountability (Ackerman, 2004).[8] Other factors that can influence accountability are the characteristics of the electoral system, political regime and political parties (Eaton & Schroeder, 2010).[9] In the particular case of the recall, some considered it ineffective and that one of the outcomes of recall elections has often been the paradoxical one that the incumbent has been strengthened (Qvortrup, 2011). In this essay we test if government performance and the funding sources have a role in the probability of Mayors of being revoked or reelected after controlling for other factors that could affect voters' choices. The next section explains the argument of why funding sources could affect electoral outcomes.

1.2.2 Fiscal Decentralization

The term decentralization refers to the transfer of authority and responsibilities from the central to subnational governments.[10] Decentralization as a policy includes political, administrative and fiscal aspects.[11] The literature of decentralization has evolved from the discussion of the allocation of competencies across levels of governments (first-generation theory) to an analysis that incorporates the role of institutions and public officials' incentives (second-generation theory). Under the first-generation theory of fiscal federalism, the devolution of tax and expenditure authority to lower levels of government yields greater public sector efficiency and elected public officials are considered benevolent maximizers of the

[8] Elections and recalls only hold accountable elected officials, leaving out appointed bureaucrats.
[9] 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. If elections were not competitive, this would be an argument against decentralization (Schmitter & Karl, 1991).
[10] Based on its legal status, the decentralization can refer to the deconcentration; delegation; or, devolution of local autonomy (Rondinelli, McCullough, & Johnson, 1989).
[11] The political aspect aims to promote political representation and stability; the administrative aspect aims to improve the technical efficiency; and, the fiscal aspect aims to improve the delivery of public services.

social welfare.[12] The second generation theory of fiscal federalism builds on the first generation theory, but it also incorporates a public choice and political economy perspective, and the problems of information (Oates, 2005). It focuses on the incentive effects of different intergovernmental arrangements (Barry R Weingast, 1995).[13]

Many countries have sought decentralization as a mean to achieve a more efficient public sector (Martinez-Vazquez et al., 2017). There is also the argument that decentralization might reduce corruption because there is greater interjurisdictional competition (Arikan, 2004). However, even if interjurisdictional competition motivates public officials to behave honestly, it does not necessarily mean they have the capacity to do so (Fan, Lin, & Treisman, 2009).

On the issue of how the decentralized responsibilities should be financed, the first generation literature theorized that revenue generation at the subnational level should follow the benefit principle.[14] The benefits of providing revenue autonomy are that subnational governments can address their vertical imbalances.[15] Without revenue autonomy there cannot be discretion as regards to the level of expenditure; and, revenue autonomy is a key indicator of subnational governments' borrowing capacity and creditworthiness (Bahl & Martinez-Vazquez, 2013).

The second generation literature emphasizes the importance of revenue autonomy due to its link to accountability. It addresses the influence of the funding sources in the behavior of public officials and citizens. According to Bahl (1992), the fiscal system of subnational governments can achieve accountability, specifically by financing services with their own revenues. By using their own revenues to finance services, public officials are more concerned about spending efficiency as they tend to be more accountable by citizens.

[12] Some of the main contributors of the first-generation are Tiebout (1956), Musgrave (1959) and Oates (1972).
[13] For a comparative review of the first and second generation theory of fiscal federalism, see (Martinez-Vazquez, Lago-Peñas, & Sacchi, 2017; Oates, 2005; Barry R. Weingast, 2009).
[14] Meaning that those who benefit from the service should pay accordingly for those benefits (Bird, 2011).
[15] This happens when the expenditure needs of subnational governments exceed their ability to finance them.

Both first and second generation literature argue that the incentives of public officials to perform well are relevant if they have a significant revenue autonomy (Bird, 2009). Own revenues are not only "easier" to use but they can also allow getting more resources in the credit market. Also, citizens can assess the performance concerning the amount and qualities of services they are getting for the taxes they pay (Yilmaz, 2009).[16]

On the other hand, transfers cause concern because they generate income that can be relative substantial, is paid by external actors, and accrues directly to government without requiring bureaucratic capacity or interaction with citizens. The risk of being financed mostly with transfers is that elected public officials are less accountable for their fiscal decisions because they can increase spending without increasing taxes relieving social pressure for greater accountability (Paler, 2013; Ross, 2001). Also, it could cause a delay in the operations of local governments since most transfers are assigned to a particular purpose and/or required an approval process.[17] However, there is also empirical evidence that citizens do care about their share of transfers (Ross, 2012).

Besides the influence that the nature of the funding sources may have on the behavior of elected public officials, the literature also consider the incentives associated with the electoral cycle. The theory of political business cycles (PBC) originated with Nordhaus (1975) proposed a model in which incumbent politicians would manipulate the economy to gain electoral advantage. The model assumes myopic voters cannot perceive the systematic relationship between policy decisions and the timing of elections while non-myopic voters are likely to punish rather than reward the political manipulation of policies directed at securing electoral advantage (Rosenberg, 1992). The study of Peltzman suggests that American voters are

[16] 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 deficits/surpluses.
[17] There are other factors that may also influence public officials and citizens' behavior. For example, the clarity of the assignment of responsibilities influences citizens' capability to assess their local authorities' performance. According to Lago-Peñas (2010), it is easier for citizens to correctly assign responsibility for government action when the political competencies are in the hands of the national government.

especially averse to higher spending, penalizing candidates irrespective of the political office up for grabs (Peltzman, 1992). The rationality is that in more developed democracies, voters are able to identify the strategy of the incumbent. However, most studies show that voters reward increased public expenditure at national, regional and local levels (Akhmedov & Zhuravskaya, 2004; Litschig & Morrison, 2012).

There are other researchers that conceive the PBC mechanism through changes in the expenditure composition rather than its level in order to affect electoral outcomes (Rogoff, 1990). Mayors are more likely to manipulate the expenditure components that are visible to the electorate in a manner that could signal greater competence (Veiga & Veiga, 2007). The obvious question would be what those components are. Following the economic classification used for expenditure budgets, we distinguished between current and capital expenditure.[18] Some researchers consider current expenditure more rigid than capital expenditure, [19] therefore the opportunistic behavior focuses on investment expenditures that are highly visible to the electorate, such as infrastructure. However, other researchers argue that capital expenditure is more rigid because most of them are long term and is difficult to coordinate with elections. Having incomplete projects at election time could create political risks for incumbents, who may be seen as unable to deliver promised benefits (Block, 2002).

In this paper, we aim to analyze different elements of the expenditure structure that may have different effects on electoral outcomes: the funding and the components. Considering the complexity of the rationality of elected public officials and voters, we do not assume these sides are mutually exclusive.

[18] Current expenditure includes the disbursements destined to the operations of production of goods and services. Capital expenditure includes the acquisition or production of tangible assets which serve for the production of goods and services (MEF, 2011).
[19] For example, items like salaries do not have enough flexibility since they are regulated by contracts.

1.2.3 Government Performance

Most of the discussion of the importance of government performance has been developed in the two previous sections.[20] Government performance plays a significant role in the literature of decentralization and electoral accountability. Improving efficiency and equity are part of the goal of transferring responsibilities and resources to subnational governments and voters use (a measure of) government performance to evaluate their elected public officials.

The citizens' evaluation of elected public officials is considered retrospective evaluation.[21] Citizens examine whether the state of the world has improved under the elected public official's watch, and vote accordingly. If electors vote retrospectively, elections should make policy makers accountable to the public; and, the threat of losing office in the next period, compels elected public officials to deliver good services and refrain from extracting rents (Barro, 1973).

Government performance refers to different concepts. In the context of fiscal decentralization, fiscal performance refers to the fiscal discipline in the use of the money (Rodden, 2002; Yilmaz, 1999). There is evidence that voters can reward prudent financial policy (Brender, 2003).[22] However, the literature of government performance has extended from being initially associated with cost-efficiency improvements to having an emphasis on effectiveness. Some authors (Ammons, 1997; Carnevale & Carnevale, 1993; DuPont-Morales & Harris, 1994) highlight the importance of expanding the concept of performance from traditional measures of monetary resources to include information about an organization's purpose, direction, and impact. Table 1.1 shows different types of performance measures.

[20] The definition of government performance differs between presidential and subnational elections. While voters focus on the perception of the national economy at the moment of Presidential elections, it is more likely they will pay more attention to the activities happening in their jurisdictions in local elections.
[21] However, this analysis has mostly focus in national and state elections. According to a study done by Berry and Howell (2007), less than 1% of the 212 articles on elections published between 1980 and 2000 in five top political science journals examined local elections, none of which concerned retrospective voting.
[22] The effect is assumed to be driven by the better information availability; voter tendency to focus on local issues; and, imposing a hard budget constraint by the government.

Besides the complexity of the concept, there are other challenges associated with developing a performance measurement system that can be useful for different interest groups and contribute to different goals (like improving performance and accountability) (Bromberg, 2009). Measuring government performance has the potential to improve the communication between budget office in the states and legislators, improve service quality and increase awareness about the results (Willoughby, 2004). However, some incumbents have incentives to hide taxes, overemphasize the benefits of spending, and hide government liabilities (Benito & Bastida, 2009).

The discussion of the role of government performance measures in the decision making process of public officials goes beyond the scope of this paper. Our paper focuses on testing the role on citizens, specifically voters.

1.3 Peruvian local governments

Peru is a constitutional democratic country located in South America with a population of 31 million as of 2015. The main economic activities are agriculture, fisheries, mining, exploitation of oil and gas, and manufacturing of goods. The mining industry is the sector with the greatest growth and contribution to the GDP, exports, and tax input.[23]

The country has experienced a reduction in poverty over the past decade. The incidence of poverty has fallen from 59% (2004) to 22% (2015) and extreme poverty has fallen from over 16% (2004) to less than 5% (2015). However, national averages usually hide the disparities between age groups and regions.[24]

[23] By the early 2010s, the value of Peru's mining exports averaged nearly 25 billion US dollars, or 14% of GDP and over 50% of total exports. Source: http://www.bcrp.gob.pe/statistics/annual-tables.html. The GDP per capita has expanded from USD 3,311 in 2000 to USD 6,089 in 2016 (values express in constant 2010 US$). Source: https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=PE.

[24] For instance, the incidence of poverty among children under 14 years old is around 30%, but in rural areas the incidence is about the 50% (INEI, 2013, 2016). In 9 of the 26 regions, the incidence of poverty is over 34%. The regions with the highest incidence of poverty are characterized by a higher physical vulnerability in terms of occurrence of earthquakes, volcanism, droughts and frosts (MINAM, 2016a).

The country has been undergoing a decentralization process since 2002.[25] The process has been gradual and fiscally conservative trying to preserve fiscal discipline at the subnational level. Although a lot of regulation was issued and implemented regarding fiscal assignments, most of it took place on the expenditure side, with very weak attempts to enhance the revenue autonomy of subnational governments.

1.3.1 Administrative and political organization

The territory is composed of departments (or regions), provinces and districts, which are the base for the political demarcation.[26] There are three major tiers of government: A national government, regional governments and local governments (or municipalities); this last tier is divided into provincial and district municipalities. Regional and local governments approve their own budgets and local governments do not depend hierarchically on the regional governments. The same way, district municipalities do not depend hierarchically on the provincial municipalities.[27]

Local governments consist of a Municipal Council as the policy-making, regulatory and oversight body, the Mayor as the executive organ, and a Local Coordination Council (CCL) in charge of promoting public participation mechanisms. The Mayors and councilpersons elected assume office the first day of January following the election year.[28] Citizens have the right to elect their subnational authorities and the right to request their vacancy or recall from office.[29]

[25] 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).
[26] The country can also be divided into 3 geographical areas: the coast -where the capital city of Lima is located- (that represents 10.5% of the territory); the highlands or Sierra -which contains the country's major mineral deposits- (32% of the territory); and the tropical forest -which is the less populated- (57.5% of the territory).
[27] The population and number of district municipalities is shown in Table 1.2.
[28] Regional governments consist of a Council as the regulatory and oversight body, the Governor as the executive organ, and a Coordination Council as a consultative body to coordinate with municipalities.
[29] The recall process (CPR) is a mechanism that allows citizens to demand a vote for the electorate on whether an elected public official should be removed from office before the end of his/her term.

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.[30]

The electoral rules and the local political environment influence the local 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. [31] Also, small political organizations do not face a serious threat of de-registration if they do not reach a minimum number of votes (Crabtree, 2010; Morgenstern & Green, 2009). The previous situation has caused an increase in the number of lists that compete in local elections (see Table 1.3 which results in a higher vote dispersion and reduces the percentage of votes obtained by the winner.[32]

The role played by traditional national political parties has also influenced local elections. In 1980, national parties had almost full control of local governments. After the 2002 decentralization process, subnational political organizations, particularly regional movements, became the main 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 mechanism and the degree of institutionalization of political parties also explain the significant use of recall referendums (CPRs) (Welp, 2016). To start a recall referendum, the National Election Board ask to collect some signatures, but it does not require a legal process to demonstrate acts of corruption or bad management.[33] Since its first

[30] 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.

[31] The country is characterized by a high level of municipal fragmentation and most of the provinces and districts have not formalized or updated their political and administrative boundaries or mapping according to the Territorial Demarcation and Organization Law (see Figure 1.1 and Figure 1.2). According to the National Census of 2007, 49% of the districts should be merged for not meeting the minimum number of inhabitants. This is explained in part by the absence of public services in remote locations.

[32] 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).

[33] 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).

application in 1997, there have been 10 rounds of recalls where more than 5,000 subnational authorities have been evaluated and more than 1,700 were revoked (see Table 1.4).[34] Also, we found four cases where the Mayor was revoked, but still had the chance to run for reelection and won. We show one of those cases in Figure 1.3.

1.3.2 Public expenditure structure

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

Subnational spending has increased in the last years. The share of total spending executed by subnational governments rose from 30% in 2004 to 40% in 2014. Regarding GDP, the local government spending rose from 2.5% in 2004 to 4.3% in 2014 (see Table 1.5). However, there are also great inequalities, the richest district municipality has a per capita spending 250 times the spending of the poorest one (see Table 1.6).

One of the challenges in the transfer of expenditures responsibilities is the wording of the regulation. Many functions overlap between the central government and the subnational level and provide numerous functions with little clarity in their definition (see Table 1.7). Several studies (Canavire-Bacarreza, Martinez-Vazquez, & Sepulveda, 2012; Martinez-Vazquez, 2013; OECD, 2016) highlight the need to clarify the shared and exclusive responsibilities among levels of government and to establish a mechanism for the coordination and resolution of conflicts among them.

[34] 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.

The spending patterns have also been affected by the increased in the revenue sharing transfers. As the proceeds from extractive industries are by law earmarked to finance investment projects and associated infrastructure maintenance spending, a bias towards capital spending was created in the structure of subnational expenditures. As a result, the allocation of public infrastructure projects in the general budget increased on average from 30% in 2004 to 65% in 2014 for local governments. The requirements about the use of funds on capital expenditures are likely to have a negative impact on the efficiency and quality of public services (Martinez-Vazquez, 2013).

To test the relationship between government performance and electoral outcomes, we take two services provided by local governments in different levels: Municipal Solid Waste (MSW) management and Education. The provision of the first service relies mostly on local governments, which makes easier for citizens to identify responsibility. The second one is a shared responsibility between the central, regional and local government.

1.3.3 Municipal Solid Waste (MSW)

The regulation makes the provincial municipalities responsible for managing 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.[35] 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. The district municipalities 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, 2016b). Besides the fees, the service is also financed by taxes and transfers.

During 2013, Peru generated more than 7 million tons of municipal solid waste (MSW), 64% corresponds to household solid waste and 36% to non-household solid waste (see Figure

[35] Agency for Environmental Assessment and Enforcement (OEFA). Report 2013-2014 (in Spanish).

1.4).[36] One of the challenges in the provision of the service is the shortage of suitable places for final disposal. It is estimated that the country requires 190 infrastructures for the final disposal of solid waste. However, in 2014 there were only eleven supervised sanitary landfills with all the requirements and corresponding authorizations, and ten facilities for the disposal of waste from the non-municipal level at the national level (MINAM, 2013). The main source of funding is the municipal equalization transfer and the fees have a secondary role. However, many municipalities do not bother to charge fees despite of providing the service (OECD/ECLAC, 2017).

1.3.4 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.[37] In 2009, the country occupied the penultimate place in science and the antepenultimate in math and reading comprehension (PISA, 2010).[38] The three levels of government share the responsibility of provision of education. At the central level, the Ministry of Education has technical-policy and political functions. It defines, manages and coordinates the education policy in coordination with regional governments. The local governments guard the operation of primary education.[39] Local governments are not directly responsible for the provision of educational services, their role is to support and promote education. Possibly the main task of local governments is the infrastructure and equipment of schools (World Bank, 2010a).

[36] Peru has a population of more than 30 million and more than 23 million lived in cities (urban population), representing 76% of total population. The national average of MSW is more than 18 thousand tons per day from which only 48% is disposed in a supervised sanitary landfill; the remnant is being inadequately disposed in the environment (MINAM, 2014).

[37] 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/

[38] Students in rural areas are a critical group because they often speak an indigenous language and study in classrooms that combine a wide variety of ages and grades under a single teacher (Cueto, 2004).

[39] Primary education comprises six degrees organized in three cycles of two years each.

The design of the decentralization of education has been inefficient. The subnational government expenditure powers are not well defined in the legal framework. Thus, there are overlaps or 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 raise transaction costs for the provision of services (World Bank, 2010a).

1.3.5 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).[40] 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.[41] The central government sets the tax rates and regulations on the tax bases. The main characteristics of the tax revenue assignment can be seen in Table 1.8.

The local taxation exhibits a low efficiency due to generous exemptions, weak tax administration, lack of a complete or updated cadaster of properties (Alfaro & Rühling, 2007). Although there has been a recent improvement in tax collection (see Table 1.9), the

[40] 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.

[41] 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.

performance of the main local tax (property tax) is significantly lower relative to other countries in the region (see Figure 1.5).

Overall, the share of own revenues over the total has experienced a decreasing tendency falling from 36% of total revenues in 2004 to 26% in 2014. In the particular case of tax revenues, in the majority of local governments, own tax revenues represent less than 5% of total revenues. There is revenue disparity among local governments and a significant dependency on intergovernmental transfers. Only in the municipalities of Metropolitan Lima - the capital city- the tax revenue represents around 40% of their total revenues. As a result, local governments' finances heavily rely on intergovernmental transfers that bridge the gap between increasing spending needs associated to the gradual decentralization of functional responsibilities and their low capacity to raise own revenues.

1.3.6 Intergovernmental transfers

There are two major types of intergovernmental transfers to local governments: Canon and FONCOMUN (FCM). The first one comes from the exploitation of natural resources,[42] it is allocated on an origin basis and earmarked for investment and maintenance spending.[43] FCM is an unconditional equalization transfer that is allocated to all local governments by a measure of expenditure needs.[44] There is a third earmarked transfer "Ordinary Resources" (OR) set to finance operating costs of decentralized functions; however, its allocation criteria seems more discretionary compared to the previous ones.[45]

[42] There are different types of Canon: forest canon, gas canon, hydro-energetic canon, mining canon, fishing canon, oil canon and sobrecanon, mining royalties.
[43] The central government collects the taxes from the mining companies and then distributes to subnational governments. The distribution criteria is shown in Table 1.10.
[44] 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.
[45] 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.

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 the commodity prices (see Table 1.11). The evolution of the Canon is the most significant factor influencing the distribution of fiscal resources among local governments, and their revenue and spending patterns. There are around 500 district municipalities for which natural resource-related revenues account for 50& or more of their total revenues. The share of Canon made local budgets vulnerable to external shocks and added more volatility to their revenue flows. Also, there are several requirements for the use of Canon in capital expenditure. While this may be an understandable reaction to the overspending that took place at the beginning, it appears impractical when hundreds of local governments have more than 50% of revenues stemming from the Canon (World Bank, 2010b).

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 1.11). Its allocation formula does not include fiscal capacity, [46] 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.[47]

1.4 Hypotheses

We tested the role of government performance and spending in the probability of elected public officials of being removed or reelected. We consider two services provided by local governments in different magnitudes: Municipal Solid Waste (MSW) collection and Education. The provision of the first service relies mostly on local governments, which makes easier for citizens to identify who bears the responsibility. For Education, the responsibility is

[46] The allocation criteria of the FCM is presented in detailed in subsection 2.4.2.

[47] 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.

shared between the central, regional and local government. We consider the link between government performance and electoral outcomes as evidence of electoral accountability. In other words, a better performance decreases the Mayors' probability of being revoked and increases their probability of being reelected. We formally specify the hypotheses as follows:

- Mayors that provide a daily collection of MSW have a lower probability of being revoked than those that do not offer the service daily, keeping other variables constant.
- Mayors that provide a daily collection of MSW have a higher probability of being reelected than those that do not offer the service daily, keeping other variables constant.
- An increase in the percentage of dropouts among students in primary school increases Mayors probability of being revoked, keeping other variables constant.
- An increase in the percentage of dropouts among students in primary school decreases Mayors probability of being reelected, keeping other variables constant.

Due to the different incentives associated with the expenditure components and the funding sources, the link with electoral outcomes is less straightforward. We would expect a positive effect on electoral outcomes for increases in total spending and the opposite effect when total spending decreases.

- An increase in total expenditure decreases Mayors' probability of being revoked, keeping other variables constant.
- An increase in total expenditure increases Mayors' probability of being reelected, keeping other variables constant.

In addition, we aim to analyze whether the expenditure components have different effects on electoral outcomes. Following the economic classification used for expenditure budgets, we distinguished between current and capital expenditure. We specify the hypotheses as follows:

- An increase in capital expenditure decreases Mayors' probability of being revoked, keeping other variables constant.

- An increase in capital expenditure increases Mayors' probability of being reelected, keeping other variables constant.

Finally, we analyze whether the expenditure funding shares have different effects on electoral outcomes. We formally specify the hypotheses as follows:

- An increases in the portion of expenditures financed with transfers decreases Mayors' probability of being revoked, keeping other variables constant.
- An increases in the portion of expenditures financed with transfers increases Mayors' probability of being reelected, keeping other variables constant.

Other variables tested are the political alignment with the provincial municipality (being from the same political organization as the provincial municipality Mayor reduces the probability of being recalled and increases the probability of being reelected) and gender (Female Mayors have a higher probability of being recalled and lower probability of being reelected than male Mayors). Also, we include altitude, land area and average household expenditures to control for the accessibility, size of the district and economic conditions of the district. The summary of the expected effects is shown in Table 1.12.

1.5 Data and empirical methodology

The purpose of this analysis is to examine the extent to which government performance and expenditure structure affect the probabilities of a Mayor of being revoked and reelected. For this purpose, we perform a cross-section analysis, which subjects the results to the political and economic circumstances at the time of the cross-section observation and the fixed effect of the districts. We use a set of control variables to isolate specific features of the districts. The Mayor of the district municipality is the unit of analysis.

The data were obtained from several public organizations: 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).

The list of variables that are part of the analysis and their definitions is shown in Table 1.13 and the summary statistics are shown in Table 1.14. Our sample considers 1,632 district municipalities for the period 2011-2014.[48] 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, 319 (31.3%) won and 701 (68.7%) lost.

We consider two measures of performance: The first one is the educational outcomes measured as the percentage of students in primary school that drop out; the second one is the frequency of the trash collection. 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 the capital and current expenditures.

The first dependent variable is an ordinal variable with a value of 0 if the Mayor is not part of a recall process, 1 if the Mayor was part of the recall process but not revoked and 2 if the Mayor is revoked. The second dependent variable is a dummy variable with a value of 1 if the Mayor is reelected and 0 otherwise. We use an ordered logit model to analyze the effect of the covariates in the recall process and a Probit binary model to analyze the effect of the covariates in the reelection process. Some of the challenges of the empirical methodology are the presence of multicollinearity[49] and the rejection of the proportionality of odds assumption. The details of each model are developed in the following sections.

[48] We took out from the sample the municipalities that were created after 2010 and the particular case of a province that has only one district. The evolution of the number of districts is shown in Table 1.2.
[49] Multicollinearity occurs when two or more independent variables in the model are approximately determined by a linear combination of other independent variables in the model.

1.5.1 Probability of being recall

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

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

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 share of the expenditures finance with transfers, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_sha_i$; Model 2: natural log of total expenditure per capita is divided into current and capital expenditures and the share of the expenditures finance with transfers, $x_2\beta = \beta_1 cu\_exp_i + \beta_2 ca\_exp_i + \beta_3 tr\_sha_i$; Model 3: natural log of total expenditure per capita considered as a single covariate and the natural log of total expenditure finance with transfers per capita, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_exp_i$; and, Model 4: natural log of total expenditure per capita is divided into current and capital expenditures and the natural log of total expenditure finance with transfers per capita, $x_2\beta = \beta_1 cu\_exp_i + \beta_2 ca\_exp_i + \beta_3 tr\_exp_i$.

x_3 is a fixed matrix that includes the political variables: $x_3\delta = \delta_1 affiliation_i + \delta_2 gender_i + \delta_3 nro\_candidates_i$. Finally, x_4 is a fixed matrix that includes the control variables and the intercept: $x_4\gamma = \gamma_0 + \gamma_1 householdexp_i + \gamma_2 altitude_i + \gamma_3 area_i$.

The ordered logit model assumes an underlying linear relationship that is the same at any cut-point. This is called the proportional odds assumption or the parallel regression assumption. To test whether this is the case we apply the oparallel command.

1.5.2 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, $x_2\beta = \beta_1 to\_exp_i + \beta_2 tr\_exp_i$.[50] x_3 is a fixed matrix that includes the political variables: $x_3\delta = \delta_1 affiliation_i + \delta_2 gender_i + \delta_3 nro\_candidates_i$. Finally, x_4 is a fixed matrix that includes the control variables and the intercept: $x_4\gamma = \gamma_0 + \gamma_1 householdexp_i + \gamma_2 altitude_i + \gamma_3 area_i$.

In addition, we use a Heckman selection model using the Mayor's affiliation to a political party (rather than other types of political organizations) as instrumental variable to control for selection bias. Initially, we do not consider the selection bias and used an ordinal dependent variable ($REE3_i$) with a value of 0 if the Mayor lost 2014 local elections; 1 if the Mayor did not run on 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 matrix introduce for the previous model.

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

1.6 Results

1.6.1 Probability of being recalled

The results of the effect of performance and expenditure on the probability of a Mayor to be revoked can be seen in Table 1.15 reported as odds-ratios. 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 1.16). The initial analysis included the information about performance and expenditure in a yearly format and as an average. However, the challenge of using a yearly format is the high correlation among years which undermines the significance of the independent variable. In this paper, we show the formats that present higher significance.

The coefficients of the variables are significant and consistent across the four models. The measures of performance (daily provision of garbage collection and percentage of dropout among students in primary school) show the expected sign. The measures of expenditure based on their components have different effects in the probability of being revoked. While increasing total expenses per capita decreases the probability of being revoked; when we consider the expenditure by components, increasing current expenses per capita increases the probability of being revoked. The political variables confirm the importance of political alignment with the upper level of government (Mayor of provincial municipality) and the bias against Female Mayors. Also, a higher number of candidates in the elections of 2010 seems to reduce the probability of a Mayor of being revoked. Finally, the control variables show that less geographic accessibility (measure as higher altitude and bigger territory) decreases the probability of being revoked.

1.6.2 Probability of being reelected

The results of the effect of performance and expenditure on the probability of a Mayor to be reelected can be seen in Table 1.17.[51] The first two columns show the results of the Probit model without correcting the selections bias. The next two columns show the results of the Heckman Probit model.[52] According to the results of the Wald test we reject the null Rho=0; therefore, we use the results of the Heckman Probit model.[53] Also, as the previous case of the probability to be revoked, the analysis consider the information about performance and expenditure in a yearly format and as an average. Again, we show the formats that present higher significance.

Both measures of performance show the expected impact in the probability of being reelected, but only the first one is significant. From the measures of expenditure based on their components, the total expenditure per capita has a significant and positive effect in the probability of being reelected, but we did not find different effects based on their 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 political and control variables were insignificant.

1.7 Conclusions

How to manage the money in order to provide goods and services that satisfy the needs and preferences of citizens is a general question that runs across different fields. Political Science, Public Finance and Budgeting have their approach of who are the main stakeholders and mechanism that influence their behavior. According to the literature of fiscal decentralization, transferring resources and responsibilities to lower levels of government can improve public spending efficiency, partially motivated by the citizens' political participation.

[51] The results of the analysis in which the selection bias is not treated and the dependent variable is an ordinal variable is shown in Table 1.18. We use an ordered probit model and a multinomial probit model. We test the proportional odds assumption with a LR test. The results shown in Table 1.19 provided evidence that the assumption has been violated.
[52] The results for the interest equation are on the top of the table and the selection equation are at the bottom.
[53] Rho is the correlation between the errors of the interest equation and the selection equation.

According to the literature of electoral accountability, government performance can be improve by providing mechanism through which citizens can reward or punish public officials. Finally, the literature of government performance, address the criteria to measure performance and to incorporate this information in the decision making process of stakeholders.

This paper attempts to integrate these fields in order to provide a comprehensive empirical analysis of electoral accountability using the case of the Peruvian municipalities. The advantage of using a 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 in two mechanisms of electoral accountability: recalls and elections. Even though both mechanism follow a similar structure, recalls allow to remove elected representatives before the end of their regular term and it requires the proactive involvement of voters in collecting the signatures to initiate the recall process.

The novelty of this paper is providing a case in which both mechanism can be tested. The variables to government performance, political environment and accessibility seems to be more significant in the Mayor's probability of being revoked than being reelected. Another finding is that voters seem to assign different valuation for the expenses based on their components, for the case of probability to be revoked. While increasing the percentage of total expenses per capita decreases the probability of being revoked and increases the probability of being reelected; when we consider the expenditure by components, the increase in the percentage of current expenses per capita increases the probability of being revoked. Despite these results, the effectiveness of the recall and election process is still subject of analysis. As we noticed before there are cases where a Mayor that was formally revoked had the opportunity to run for reelection and win.

Table 1.1 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 for serious crime investigations.
Process /Activity	Measures of regular activities conducted within the organization.	The number of applications processed.
Outputs	Measures of the quantity 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/or 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.

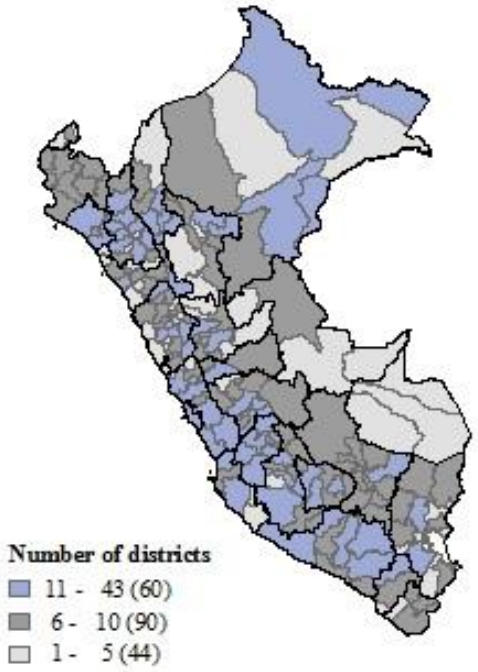
Source: (Melkers & Willoughby, 2005; Willoughby, 2004)

Table 1.2 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

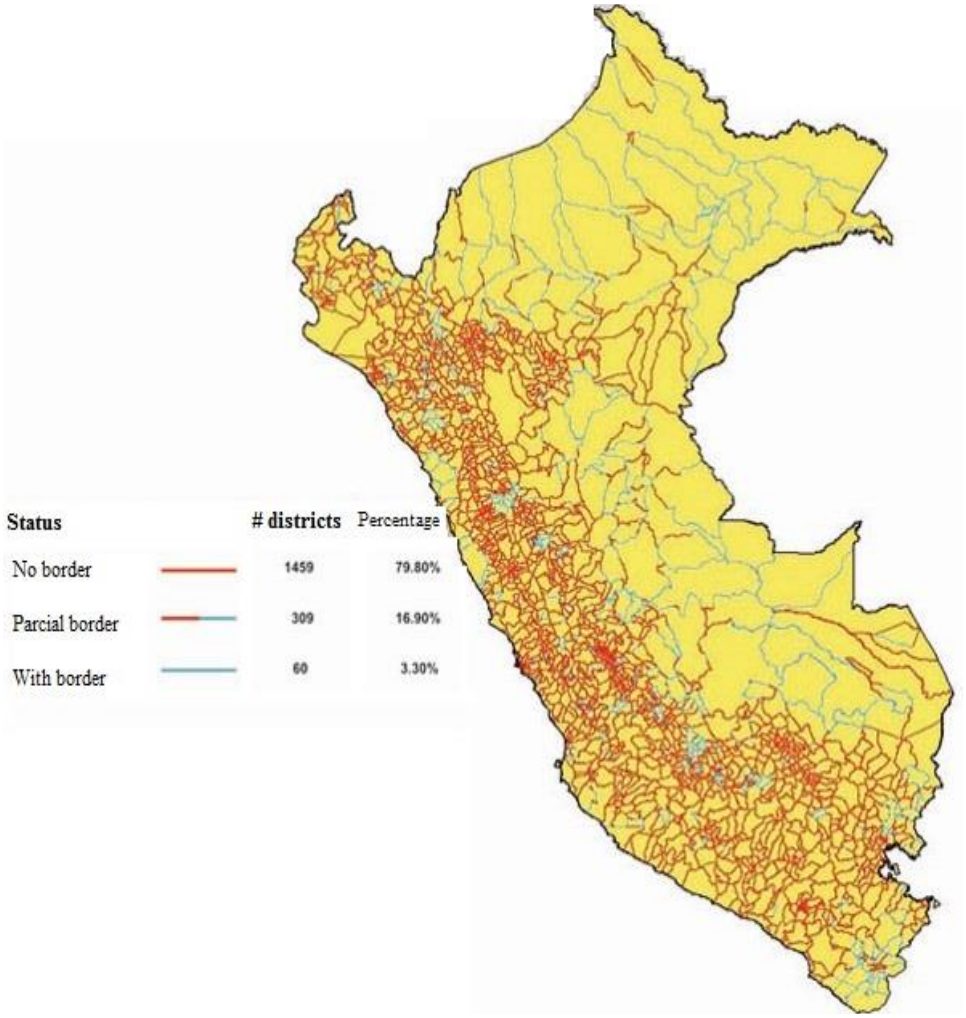
Source: National Institute of Statistics and Informatics (INEI)

Figure 1.1 Number of districts per province



Notes: The map shows 194 of the 196 provinces. The data was extracted from the GADM database (www.gadm.org), version 2.8, November 2015. The boundary information is for statistical data collection and tabulation purposes only.
Source: INEI

Figure 1.2 Situation of territorial demarcation



Source: National Office of Dialogue and Sustainability (ONDS).

Table 1.3 Number of lists that competed in local elections

Number of Lists that competed in the local elections	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 1.4 Recall processes in Peru from 1997 to 2013

	1997	2001	2004	2005	2008	2009	2012	2013
Local authorities								
Part of the process	61	166	187	19	240	67	264	591
Revoked	42	11	29	11	95	22	69	188
Regional authorities								
Part of the process	129	462	691	75	999	271	1040	42
Revoked	93	27	109	42	444	132	400	25

Source: (ONPE, 2013b)

Figure 1.3 Case of a Mayor that was revoked, but was reelected in the next election

Nombres : PEDRO BUSTAMANTE CIEZA
Fecha Nacimiento : 29/06/1970
UBICACIÓN SEGÚN EL PADRÓN ELECTORAL
Región : AMAZONAS
Provincia : BONGARA
Distrito : SHIPASBAMBA
Ver Hoja de Vida
Ver Plan de Gobierno

Historial Partidario | Procesos Electorales | Incidencias Electorales | Estabilidad en el Cargo | Participación Ciudadana

PROCESOS ELECTORALES

Proceso Electoral	Cargo al que Postuló	Organización Política	Región	Provincia	Distrito	Elegido	Hoja de Vida	Más Datos
ELECCIONES REGIONALES Y MUNICIPALES 2014	ALCALDE DISTRITAL	OBRAS POR AMAZONAS	AMAZONAS	BONGARA	SHIPASBAMBA	SI		
ELECCIONES REGIONALES Y MUNICIPALES 2010	ALCALDE DISTRITAL	MOVIMIENTO INDEPENDIENTE SURGE AMAZONAS	AMAZONAS	BONGARA	SHIPASBAMBA	SI		
ELECCIONES REGIONALES Y MUNICIPALES 2006	REGIDOR DISTRITAL	FUERZA DEMOCRATICA	AMAZONAS	BONGARA	SHIPASBAMBA	SI		

Nombres : PEDRO BUSTAMANTE CIEZA
Fecha Nacimiento : 29/06/1970
UBICACIÓN SEGÚN EL PADRÓN ELECTORAL
Región : AMAZONAS
Provincia : BONGARA
Distrito : SHIPASBAMBA
Ver Hoja de Vida
Ver Plan de Gobierno

Historial Partidario | Procesos Electorales | Incidencias Electorales | Estabilidad en el Cargo | Participación Ciudadana

SUSPENSIONES VISTAS EN EL JNE

No existen registros.

VACANCIAS

No existen registros.

REVOCATORIAS

Periodo de Gobierno	Fecha Consulta	Región - Provincia - Distrito	Cargo	Organización Política	Revocado	Resolución	Más Datos
2011-2014	30/09/2012	AMAZONAS - BONGARA - SHIPASBAMBA	ALCALDE DISTRITAL	MOVIMIENTO INDEPENDIENTE SURGE AMAZONAS	SI	071-2012-JNE	

Source: INFOGOB (http://www.infogob.com.pe)

Table 1.5 Local government expenditures as a % 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 1.6 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.

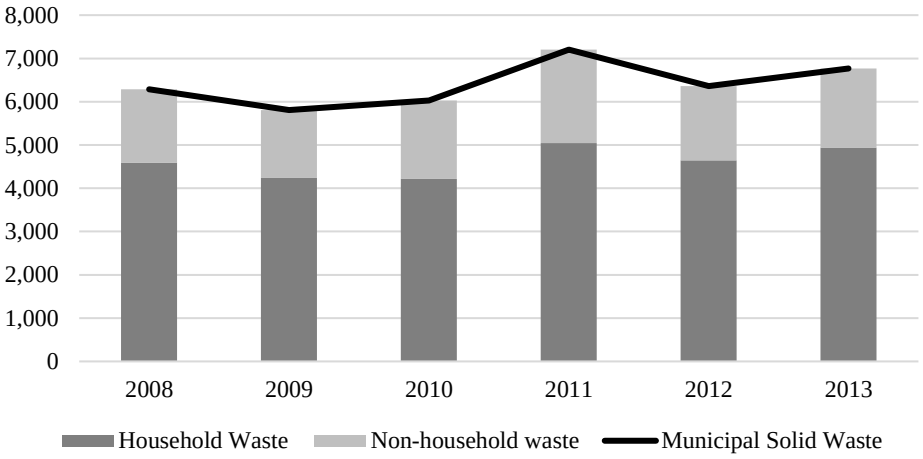
/1 The amounts are divided by the population of the district where the provincial municipality is located.

Table 1.7 Allocation of responsibilities by level of government

	Central government	Regional governments	Local governments
Exclusive	Foreign relations Defense, national security, and armed forces Justice, with the exception of Justice administration Internal order, national and border police 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 in accordance with the Constitution Design and supervision of national and sectoral policies, which are compulsory for all levels of government	Regional development plans and executing corresponding socio-economic programs 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	Urban and rural municipal development Management and regulation of local public services Internal organization of the local government Local development plan Execution and monitoring of local public infrastructure
Shared	All other responsibilities	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	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 1.4 Generation of Municipal Solid Waste, 2008-2013 (thousands of tons per year)



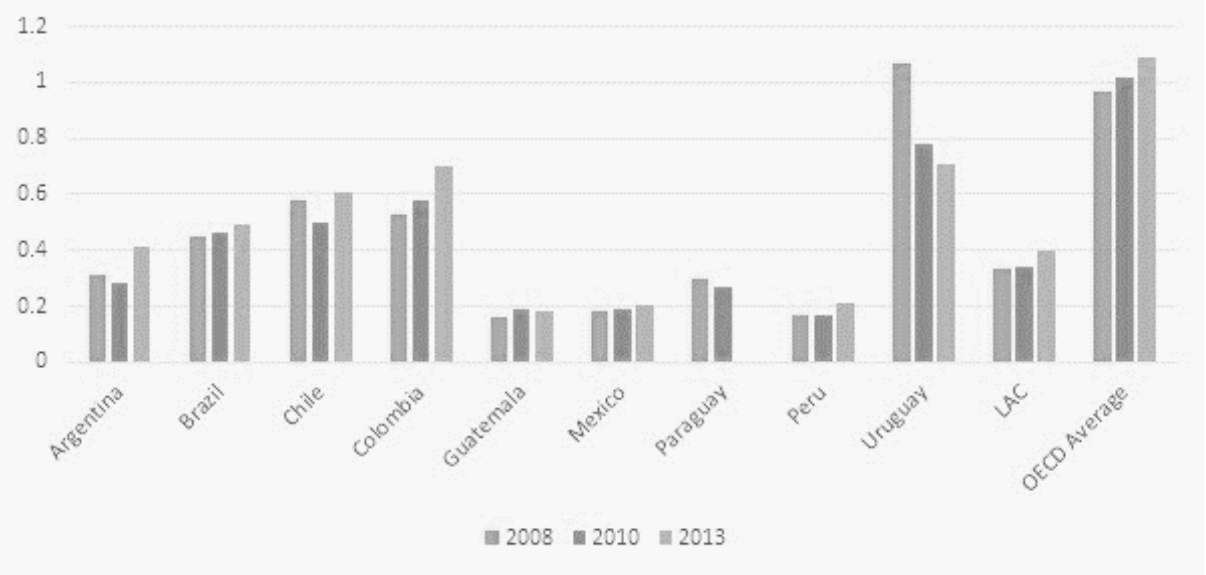
Source: MINAM-SIGERSOL

Table 1.8 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 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 1.5 Property tax to GDP ratio, Peru and selected comparators



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

Table 1.9 Revenue composition of local governments, 2004-2014 (as % 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/0	0.23	0.25	0.22	0.30	0.32	0.33	0.34	0.35	0.39	0.41	0.39
Other tax revenues	0.06	0.05	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.06	0.05
Nontax revenues/1	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/2	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 transfers	0.33	0.20	0.05	0.16	0.22	0.09	0.37	0.35	0.28	0.28	0.25
Capital revenues/3	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

/0 includes vehicle property, property transfer and land and buildings property.
/1 Includes fees, rental of property, service charges, sales of goods, fines and others.
/2 includes canon, sobrecanon, royalties, customs duties and concession rights.
/3 Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table 1.10 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 are applicable 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 Huanuco.
Source: (Canavire-Bacarreza et al., 2012) and Law No. 27506 (Law on the Canon).

Table 1.11 Revenue structure of local governments, 2004-2014 (%)

	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/0	9	9	8	8	9	10	10	10	10	12	12
Other tax revenues	2	2	1	1	1	2	1	1	1	2	2
Nontax revenues/1	24	23	18	14	15	18	14	14	14	14	13
Transfers	58	63	68	75	72	64	67	71	69	68	65
Canon/2	15	25	35	47	41	36	33	39	40	36	32
FCM	30	30	31	24	25	25	23	22	22	24	25
Other transfers	13	8	2	4	6	3	11	10	8	8	7
Capital revenues/3	6	3	4	3	3	6	7	4	5	5	9
Total	100	100	100	100	100	100	100	100	100	100	100

/0 includes vehicle property, property transfer and land and buildings property.
/1 Includes fees, rental of property, service charges, sales of goods, fines and others.
/2 includes canon, sobrecanon, royalties, customs duties and concession rights.
/3 Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table 1.12 Expected impact in 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

Table 1.13 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 1.14 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

Table 1.15 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
MSW-Daily, 2010	0.719**	0.713**	0.724**	0.719**
Percentage of dropouts, primary edu., 2011	1.042**	1.038**	1.041**	1.037**
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***
Same pol. org. that prov. Mayor in 2010	0.716**	0.712**	0.721**	0.714**
Mayor-Male	0.545**	0.573*	0.534**	0.567**
Number of candidates in 2010 local elections	0.917***	0.921***	0.916***	0.921***
Log of Avg. of HH monthly exp. (n.s. per capita), 2013	0.517***	0.438***	0.515***	0.437***
Log of Altitude	0.833***	0.860***	0.835***	0.857***
Log of Area	0.901**	0.925*	0.910**	0.926*
Constant cut1	0.00307***	0.00937***	0.00971***	0.0144***
Constant cut2	0.0161***	0.0498**	0.0509**	0.0765*
Observations	1,632	1,632	1,632	1,632
Pseudo R2	0.0345	0.0432	0.0348	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 1.16 Tests of the parallel regression assumption

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

Table 1.17 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
MSW-Daily, 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)
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,		0.364***		0.219***
avg. 2012-2013		(0.0998)		(0.0576)
Log of exp. per capita financed		-0.217**		-0.120**
with Transfer, avg. 2012-2013		(0.0859)		(0.0523)
Same pol. org. that prov. Mayor in 2010	-0.0296	-0.0203	-0.0151	-0.00982
	(0.0931)	(0.0930)	(0.0497)	(0.0500)
Mayor-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	0.281**	0.268**	0.189**	0.180**
exp. per capita, 2013	(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 Area	0.0289	0.0384	0.0185	0.0240
	(0.0313)	(0.0315)	(0.0179)	(0.0178)
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			0.170***	0.169***
with a political party			(0.0497)	(0.0498)
Constant			0.259***	0.259***
			(0.0352)	(0.0353)
Rho				
Constant			-5.566***	-5.303***
			(1.924)	(1.693)
Observations	1,632	1,632	1,632	1,632
Pseudo R2	0.0408	0.0378		
Wald test of indep. eqns. (rho = 0): chi2(1) =			8.37	9.81
Prob > chi2 =			0.0038	0.0017

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).

Table 1.18 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) mprobit-Model 1 Won	(5) mprobit-Model 2 Didn't run	(6) mprobit-Model 2 Won
MSW-Daily, 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)
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)
Same pol. org. that prov. Mayor in 2010	-0.000813	0.00306	0.0399	-0.0278	0.0366	-0.0178
	(0.0619)	(0.0619)	(0.103)	(0.115)	(0.103)	(0.115)
Mayor- 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 Avg. of HH monthly exp. (n.s. per capita), 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 Area	0.0268	0.0323	0.0605*	0.0399	0.0555	0.0508
	(0.0218)	(0.0220)	(0.0365)	(0.0392)	(0.0369)	(0.0395)
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 1.19 Testing the proportionality of odds assumption using the Likelihood Ratio test

Variables	**(1)** **omodel** **Model 1**	**(2)** **omodel** **Model 2**
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 Area	0.0268	0.0323
	(0.0218)	(0.0220)
Same political organization that	-0.000813	0.00306
Provincial Mayor in 2010	(0.0619)	(0.0619)
Gender Mayor-Male	0.233	0.216
	(0.156)	(0.156)
Number of candidates in 2010	-0.0539***	-0.0557***
local elections	(0.0116)	(0.0117)
Percentage of dropouts,	-0.0235	-0.0244*
primary education, 2013	(0.0143)	(0.0143)
MSW-Daily, 2011	0.160**	0.161**
	(0.0645)	(0.0645)
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	chi2(10) = 97.74	chi2(10) = 99.45
of coefficients across response categories	Prob > chi2 = 0.0000	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).

2 Improving interjurisdictional equalization

2.1 Introduction

One of the goals of fiscal decentralization is to provide equal access to public services by citizens regardless of where they live in the country; simultaneously, one of the goals of the general government is to reduce poverty and inequality. Accomplishing these goals is partly restricted by the challenge of measuring the expenditure needs and fiscal capacity of subnational governments, particularly in a context of a great disparity.

An appropriate system of intergovernmental transfers could overcome the vertical[54] and horizontal[55] gaps associated with the mismatch between expenditures and revenues. Intergovernmental transfers can also compensate the presence of externalities in the provision of local public goods; finance those services that are considered priority by the central government; and, provide incentives that will promote fiscal effort and efficiency in spending. In particular, unconditional transfer mechanisms can either improve the vertical fiscal balance by providing general-purpose funding at the subnational level or can improve the horizontal fiscal balance by compensating for fiscal disparities across jurisdictions.

This essay approaches the question of how the allocation method of the two types of transfers, described immediately below, affect the fiscal disparities between and within subnational jurisdictions. The two types of transfers are (1) revenue-sharing transfers that come from natural resource taxes and allocated on a derivation or origin basis; and, (2) equalization transfers, specifically the one based on expenditure needs.

[54] The expenditure needs of subnational governments arising from their functional competences exceed their ability to self- finance them.
[55] It is the result of the different tax capacities and economic bases of subnational governments and also of different expenditure needs arising from differences in the costs of service delivery and differences in the profiles and needs of the resident population.

We examined how the current structure of the Peruvian municipal equalization transfer affects the fiscal disparities among the municipalities and how its effect can be improved by making adjustments to the current allocation formula. The rest of this essay is organized as follows. Section 2.2 presents the theoretical arguments for the role of intergovernmental transfers in reducing fiscal disparities. Section 2.3 describes the main characteristics of the fiscal structure of the Peruvian municipalities and examine the fiscal disparities by groups of revenue. Section 2.4 presents the main characteristics of the Peruvian municipal equalization transfer (also called Municipal Compensation Fund or FCM) and describes the variables and the allocation mechanism that are currently used to distribute it. Section 2.5 introduces the alternative to allocate the FCM and the methodology used to evaluate the current allocation versus the alternative. Section 2.6 presents the results and Section 2.7 concludes by drawing the lessons learned.

2.2 Role of intergovernmental transfers

The three potential economic objectives in providing transfers to subnational governments are the internalization of cross-boundary or spillover effects to other jurisdictions, equalize tax and/or service capacity across jurisdictions, and to improve the overall tax system (Oates, 1999). In most decentralized systems, the expenditure responsibilities of subnational governments are not fully covered by their own revenues (Garman, Haggard, & Willis, 2001). Fiscal disparities among jurisdictions arise mainly from the differences between their fiscal capacity and expenditure needs. Transfers are mechanisms to address horizontal disparities, vertical imbalances and to correct for major administrative weaknesses and streamline bureaucracy (Schroeder & Smoke, 2003). [56]

[56] Vertical imbalance happens when the expenditure needs of subnational governments exceed their ability to finance them. Horizontal disparities are the result of the different tax capacities and economic bases of subnational governments and also of different expenditure needs.

However, there is no guarantee that an intergovernmental transfer system will not have contradictory effects. In this essay we focus on two specific types of transfers that may present the unintended situation: (1) equalization transfers based on expenditure needs; and, (2) revenue-sharing transfers that come from natural resource taxes, allocated on a derivation basis and earmarked for investment.[57]

The rationale behind equalization transfers is to reduce the variation in horizontal fiscal imbalances that may exist between subnational jurisdictions in a given country (Reschovsky, 2007). This variation can be caused by differences in fiscal capacity[58] and/or in expenditures needs (or their associated costs)[59] that correspond to differences in the jurisdictions (Martinez-Vazquez & Sepúlveda, 2008).[60] Usually, the equalization formula of these transfers measures the "fiscal need" and "fiscal capacity" of each jurisdiction. These formulas result in a disproportionate share of the transfers going to those jurisdictions with the greatest fiscal need and the least fiscal capacity (Oates, 1999). Although the general goal of this transfer is to equalize,[61] its operationalization can be diverse, the equalization can be based only on expenditure needs or fiscal capacity, or could consider both factors (Martinez-Vazquez and Sepulveda, 2011b).[62]

[57] Subnational finances in this Latin America generally rely on shared taxes with extensive earmarking (Ahmad & Brosio, 2008).
[58] This refers to their economic base which affects their ability to raise a particular level of revenue with standard rates and administration effort.
[59] Even when jurisdictions have the same fiscal capacity, they may differ in the costs due to differences in demographic profiles, geographical and climatological conditions, incidence of poverty and unemployment (Boex & Martinez-Vazquez, 2007).
[60] The concepts described previously are formally established in the formula: $FD_i = EN_i - FC_i$, where fiscal disparity (FD_i) is equal to the difference between expenditure needs (EN_i) and fiscal capacity (FC_i) (i denotes any jurisdiction). If the fiscal disparity of jurisdiction i is positive (negative) then the jurisdiction has less (more) funds than required in order to cover its expenditure needs.
[61] Since the objective of this transfer is to "equalize" rather than to affect local priorities, this transfer let the subnational governments to spend the resources as they want (Borge, 2010).
[62] Table 2.10 shows the diversity of equalization transfers in terms of their objectives.

In the case of transfers by revenue sharing, there are no clear guidelines for the best allocation (Martinez-Vazquez, 2013). An accepted economic argument for allocating at least some of these resources under a geographic criterion is to compensate residents for the pollution and environmental damage associated with the extraction of the natural resources. However, the location of natural resources is not necessarily correlated with the relative expenditure needs or fiscal capacities of the beneficiary governments. This situation creates horizontal imbalances which raise inequality between beneficiaries and non-beneficiaries (Martinez-Vazquez & Sepulveda, 2011b). This paper focuses on the effect of the interaction of these two specific types of transfers on the fiscal disparities among local governments by using information of Peru.

2.3 Fiscal capacity of Peruvian municipalities

Peru has a population of 31 million as of 2015 and approximately 31% of the population lives in the capital city (Lima). The main economic activities are agriculture, fisheries, mining, exploitation of oil and gas, and manufacturing of goods. The mining industry is the sector with the greatest growth and contribution to the economy regarding GDP, exports, and tax input.[63] The country is composed of departments (or regions), provinces and districts, which are the base for the political demarcation. There are three major tiers of government: A national government, 26 regional governments and 1,843 local governments (or municipalities). This last tier – the focus of our analysis – is divided into 196 provincial and 1,647 district municipalities.[64]

[63] The value of mining exports doubled in the 1990s and then rose by more than seven times in the following decade. By the early 2010s, the value of Peru's mining exports averaged nearly 25 billion US dollars, or 14% of GDP and over 50% of total exports. Source: http://www.bcrp.gob.pe/statistics/annual-tables.html. The GDP per capita has expanded from USD 3,311 in 2000 to USD 6,089 in 2016 (values express in constant 2010 US$). Source: https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=PE.

[64] The number of districts have been increasing the last years, the sample considered for the second paper corresponds to the latest information in 2014.

The country has been undergoing a decentralization process since 2002 with the expectation that it will promote efficiency in the public administration and better-coordinated policies. Despite the progress in areas like transparency, citizens' participation and transfer of responsibilities, the decentralization process has not enhanced the ability of local governments to generate their own revenues or provided the right incentives to develop revenue autonomy (Ahmad & García-Escribano, 2011; Martinez-Vazquez, 2013). Subsections 1.3.2, 1.3.5 and 1.3.6 in the first essay describe the main characteristics of the local governments' expenditure structure, revenue structure and intergovernmental transfers, but as a recap, we address their main characteristics.

2.3.1 Expenditure structure

The central government has issued several laws to set the expenditure responsibilities of subnational governments, which were assigned shared and exclusive competences. However, one of the challenges in the transfer of expenditures responsibilities has been the wording of the regulation. Many functions overlap between levels of government and provide numerous functions with little clarity in their definition (see Table 2.1).[65] Also, the requirements for the use of funds on capital expenditures are likely to have a negative impact on the efficiency and quality of public services (Martinez-Vazquez, 2013). The slow execution of funds, especially those coming from the exploitation of natural resources, is related with the requirement to use those funds for capital infrastructure; the rush to disburse has been hurting overall expenditure efficiency (World Bank, 2010b).

[65] For example, in the case of education, regional governments have the function to: "*formulate, approve, execute, evaluate and administer the education, culture, science and technology, sports and recreation regional policies for the region*" and to "*design, execute and evaluate the regional educational project, the culture development programs, science and technology, and the sports and recreation development program*" while local governments function is to: "*design, execute and evaluate the educational project of their jurisdiction, in co-ordination with the Regional Education Office and the Local Education Management Unit and contribute to the national and regional educational policy with an intersectional action focus*" (OECD, 2016).

2.3.2 Revenue structure

The fiscal capacity of Peruvian municipalities –understood as the revenues they can generate– comes from user charges[66] and taxes[67]. However, local governments do not have autonomy to either define the tax bases or set the rates for the taxes assigned them. Therefore, local discretion is constrained to the realm of tax administration and enforcement efforts.

The local taxation exhibits a low efficiency due to the lack of capacity of the municipalities. In the case of the property tax, many municipalities do not have a complete cadaster of properties or the existing ones are not updated (Alfaro & Rühling, 2007). In addition, the structure and administration of the tax offers several exemptions to areas used by the public sector, non-profit organizations and for agriculture. Also, it is common practice to reduce or forgive penalties to those that do not pay the tax.[68]

Table 2.4 shows how in the aggregate, tax revenues are slightly higher than revenues from user charges. If we analyze the structure of own revenues per capita, we find a significant variation by type of municipality and type of revenue (see Table 2.5, Table 2.6 and Table 2.7). The coefficient of variation in own revenues (tax and non-tax) per capita stands at a rather high level of 2.2 for provincial municipalities and 2.3 for district municipalities. If we distinguish between tax and non-tax revenue, we notice that tax revenues per capita have bigger disparity (4.2 for provincial municipalities and 4.3 for district municipalities) than user charges per capita (1.7 for provincial municipalities and 2.2 for district municipalities).

[66] It includes street cleaning, road tolls, parks maintenance, public safety services, and construction permits.
[67] The Law Decree No. 776 (1993) establishes taxes on property as the main tax revenue for provincial and district municipalities. Provincial municipalities are assigned the tax on vehicle property, and district municipalities are assigned the tax on land and buildings and the tax on property transfers. There is also a set of national taxes that correspond to the municipalities but are collected by the central government. The main characteristics of the tax revenue assignment can be seen in Table 2.2.
[68] The structure of penalties is the same across municipalities, amounting by law to 50% of the tax due if not paid by the deadline; however, municipalities can grant additional discounts.

2.3.3 Revenue disparities among municipalities

We run three regressions to explore the characteristics of municipalities own revenues (see Table 2.8). We analyze the revenues as a total and by components (tax or non-tax revenues) because of the higher costs and skills associated with the collection of taxes in comparison to charges and user fees. This analysis does not attempt to explain the determinants of municipalities own revenues, but to understand which variables can predict their differences. Considering the heterogeneity of the country, we explore those aspects that challenge the provision of goods and services.

The urbanization rate and the size of the territory are variables used in the assignment of the Peruvian equalization transfer under the assumption that both aspects challenge the provision of basic services to remote populations. The urban rate has a positive and significant association in the three specifications. The same situation happens with the territory which is positively associated with tax and non-tax revenues (separately and jointly). An interesting finding was the opposite effect of altitude, it shows a negative association with tax revenues, but it has a positive association with non-tax revenues.

Also, the results highlight the structural differences between Lima province and the rest of the country. In the same way, provincial municipalities have better fiscal performance than district municipalities. We include the log of the average household spending per capita and a dummy variable takes the value of one for all districts where there was any taxpaying mineral (mainly copper, gold, and silver) production between 2009 and 2014. Both variables are positive and significant in all the specifications showing the fiscal potential of the municipalities.

2.3.4 Intergovernmental transfers

There are two major types of transfers:[69] the first type comes from revenue sharing arrangements derived from the exploitation of natural resources among the central government and subnational governments (Canon). This transfer is not very stable due to the volatility of natural resource prices in international markets and its use -which is earmarked for capital expenditure. Also, it is allocated on a derivation basis, this situation has created administrative pressure in those municipalities that experienced a significant increase in the resources and do not have the technical capacity to use them.[70]

The second type of transfer is the Municipal Equalization Transfer (FCM) which is based on expenditure needs and managerial performance criteria and has the purpose to ensure the functioning of all municipalities. Before the implementation of the Canon, FCM represented the main source of revenues for most municipalities. However, as a result of Peru's mining boom, the Canon has grown substantially (see Table 2.3).[71]

2.4 Municipal Compensation Fund (FCM)

The Municipal Compensation Fund (FCM) was established in the Peruvian Constitution in 1994 with the goal of promoting investment in local governments.[72] The resources distributed by the FCM are mainly determined by the collection of the Municipal Promotion Tax (IPM) which is closely linked to the performance of the general sales tax (VAT). In 2010, the authorities changed the FCM allocation methodology to take into

[69] More details of the transfers are shown in 1.3.6.
[70] In addition, the beneficiaries have developed a strong sentiment of entitle that could create social tension. In 2009, the Ombudsman's office reported 268 social conflicts, of which 38% were related to mining activities
[71] In 2007, the FCM represented 32.9% of districts' budget and the Canon 21.4% (excluding the Region of Lima) (Loayza, Mier y Teran, & Rigolini, 2013).
[72]. The article 76 of the Legislative Decree No 776 sets that the IPM is levied at a rate of 2% over the operations affected by the VAT. Therefore, the monthly allocation of FCM is directly related to the performance of the tax revenue of the previous month; when the revenue increases, the allocation of the following month increases and when the levy is reduced, the municipalities receive a lower allocation.

account a broader set of unmet needs.[73] The goal of this change in the methodology was to promote equity in transfers of resources to the municipalities.[74] Based on its formula, the FCM includes characteristics of a lump-sum grant and also of a matching grant.

2.4.1 Challenges associated with FCM

The main concern about transfers is their effect in local governments' fiscal effort. Several studies have been done about this subject in the country, although the results have been ambiguous. Earlier studies by Alvarado Perez (1994); Alvarado et al. (2003); Aragon and Gayoso (2005) suggest that devolving responsibilities to sub-national governments might reduce fiscal effort and deteriorate fiscal balance especially among localities with lower fiscal capacity. On the other hand, Rabanal Sobrino and Castillo (2006) suggested that transfers can improve the fiscal capacity of local governments; however, the effect seems to be lower among those municipalities that receive transfers from Canon.

More recent studies (Martinez-Vazquez & Sepulveda, 2011a) found a negative correlation between the current transfers (FCM) and property tax collections.[75] This is later confirmed by Canavire-Bacarreza et al. (2012) who, using different econometric techniques, also found a negative and significant correlation between the FCM and tax revenues. On the other hand, the transfers from Canon had a positive effect on the level of the non-tax component of revenue collections (charges and user fees).[76]

[73] The new methodology includes measures of municipal management such as the fiscal effort of municipalities and the extent to which they are prioritizing public investment to allocate funds among different municipalities within a given province (Supreme Decree No. 060-2010-EF).
[74] The Government has also created the Incentive Plan to Improve Municipal Management (PI) through Law No 29332. This plan aims to incentivize Local Governments to improve municipal tax collection levels as well spending on investment and reduce chronic childhood malnutrition.
[75] However, they warn about the potential endogeneity bias in the estimates because lower property tax revenues per capita may also induce larger current intergovernmental transfers per capita. On the other hand, they also found that capital intergovernmental transfers (Canon) are not statistically significant.
[76] They speculate that it might be related to a greater capacity of sub-national governments to provide public services for which they can charge and, with greater demand for these services, and/or with greater ability to pay on the part of the population. In contrast, revenues from Canon seem to have little or no effect on tax collections.

The evidence suggested the presence of perverse incentives created by the equalization transfer that comes from not recognizing the municipalities' fiscal capacities to use their tax bases. The potential revenues come not only from the transfers from extractive industries (Canon), but also from their economic base. In this context, we reviewed the current structure and allocation formula of the FCM and proposed some changes. A recommendation that is explored in this essay is the inclusion of the fiscal capacity by considering the resources that municipalities received from Canon.[77] The idea is to significantly reduce the FCM funds from those local governments that receive a significant share of the Canon funds.

2.4.2 Current allocation methodology of FCM

The allocation of FCM comprises three phases (see Figure 2.1), the first phase defines the allocation to the provinces, the second phase defines the allocation to the districts and the third phase adjust the allocation that results from the previous steps.

The first phase is defined as the "Geographical allocation to the provinces" (IGP_j). The total national FCM "pool of funds" is divided into 196 parts, which are the 196 geographical provinces that make up the country. The allocation by province uses an index combining the population of the province (Pop_j) and the index of unmet needs for public services (IC_j) at the province level.[78] The index is calculated as:

$$IGP_j = \frac{Pop_j \times IC_j}{\sum_{j=1}^{196} Pop_j \times IC_j} \qquad 2.1$$

After determining the allocation to the province in the first phase, the next phase is the distribution within the province. This is called "Inter-district allocation" (IND_k).

[77] The term Canon refers to several transfers. The allocation and distribution procedure of these transfers are explained in Table 2.9.

[78] The IC_j is the simple average of the percentage of people in province *j* with no access to water (NoW_j), sewage ($NoSj$) nor electricity ($NoEj$).

20% of the amount assigned to the province is transferred to the provincial municipality[79] and the other 80% is distributed among all the districts of the province including the district where the provincial municipality is located. It includes 3 factors: (i) rurality (IR_k); (ii) territorial extension ($Terr_k$); and, (iii) municipal management (IGM_k).[80]

i) Rurality index (IR_k): The index is the weighted summation of the rural (Rur_k) and urban (Urb_k) population of the district (the rural population has a double weight). For the districts located in MML and Callao provinces, instead of the rurality index, it is used the poverty index based on the population (Pop_k) and the unmet basic needs ($NBIk$) of the district.[81] The corresponding index is:

$$IR_k = \begin{cases} \dfrac{Pop_k \times NBI_k}{\sum_{k=1}^{n} Pop_k \times NBI_k}, for\ districts\ in\ MML\ and\ Callao\ province \\ \dfrac{1 \times Urb_k + 2 \times Rur_k}{\sum_{k=1}^{n} 1 \times Urb_k + 2 \times Rur_k}, for\ other\ districts \end{cases} \quad 2.2$$

ii) Territorial extension index ($Terr_k$): This index aims to compensate districts that due to their territorial extension have difficulties providing basic services to their more remote populations.[82] The formula of the index is:

$$Terr_k = \frac{Km_k^2}{\sum_{k=1}^{n} Km_k^2} \quad 2.3$$

[79] District where the provincial municipality is located.
[80] Each of these factors represents an index itself that adds one for each province.
[81] The NBI_i is the summation of the following indicators: households with inadequate housing (NBI_1), without access to water service (NBI_2), without access to sewage service (NBI_3), households with children between 6 to 12 years old who do not attend school (NBI_4) and households with very low economic capacity (NBI_5).
[82] The Legislative Decree No. 952 (2004) modified the Legislative Decree No. 776 – Municipal Taxation Law.

iii) Municipal Management (IGM_k):[83] The index for the district is the simple average of two factors that consider the generation of own revenues (rip_k) and the prioritization of spending in investment ($ripgi_k$).

$$IGM_k = \frac{rip_k + ripgi_k}{2} \quad 2.4$$

The first factor is calculated on the basis of the index of generation of own revenues (IP_k) which considers the revenues collected on the district in the last two years. [84] The final index rip_k is the ratio of IP_k relative to the summation of the index for all the districts in the corresponding province.

$$rip_k = \left[\frac{IP_k}{\sum_{k=1}^{n} IP_k}\right] \quad 2.5$$

$$IP_k = \left[1 + \left(\frac{\frac{Owr_{t-1}}{Pop_{t-1}}}{\frac{1 + Owr_{t-2}}{Pop_{t-2}}}\right)\right]^{0.1}$$

Likewise, the second factor is calculated on the basis of the spending prioritization index ($IPGI_k$) which considers the acquisition of non-financial assets financed with FCM ($Anfa_{FCM}$) and the total spending financed with FCM in the district ($Gtot_{FCM}$). The final index $ripgi_k$ is the ratio of spending prioritization index relative to the summation of the index for all the districts in the corresponding province.

$$ripgi_k = \left[\frac{IPGI_k}{\sum_{k=1}^{n} IPGI_k}\right] \quad 2.6$$

$$IPGI_k = \left(1 + \frac{Anfa_{FCM}}{Gtot_{FCM}}\right)$$

The allocation index for the district set in the second phase is:

$$IND_k = IR_k \times 0.85 + Terr_k \times 0.05 + IGM_k \times 0.10 \quad 2.7$$

[83] The municipal management index is based on the Article 32 of Legislative Decree No. 952 that modifies the Legislative Decree No. 776 Municipal Taxation Law.

[84] In the case of the own revenues index (IP_k), before the data is converted into an index, a numeric transformation is done through which these numbers are converted to a scale between 1 and 2.

The third phase adjusts the district allocation to set a "floor value". The amount obtained on the second phase is adjusted to be at least equivalent to 8 tax units. The difference between the amount obtained in the second phase and the 8 tax units (UIT) is considered a deficit or a surplus, depending on the case. The total surplus is used to fill the total deficit and what remains is reassigned to the districts that originally have a surplus adjusted by a factor equal to the total sum of surpluses minus the total sum of deficits divided by the total sum of surpluses (RA_{8UIT}). In this step, the amount assigned exclusively to the provincial municipality is not part of the adjustment.[85] With the adjustment ratio RA_{8UIT}, we calculate the adjusted monthly allocation FCM_k where $Surplus_k$ ($Deficit_k$) is the positive (negative) difference between the preliminary monthly allocation of FCM and 8 UIT in district *k* and *s* (*d*) is the number of districts in surplus (deficit).

$$FCM_k = \begin{cases} 8UIT + RA_{8UIT} \times Surplus_k, if\ district\ k\ is\ in\ surplus \\ 8UIT \qquad\qquad\qquad\qquad\quad , if\ district\ k\ is\ in\ deficit \end{cases} \qquad 2.8$$

Where: $RA_{8UIT} = \frac{\sum_{k=1}^{s} Surplus_k + \sum_{k=1}^{d} Deficit_k}{\sum_{k=1}^{s} Surplus_k}$

The amount obtained after the 8 UIT adjustment is adjusted again to be at least equivalent to the adjusted allocation of FCM on 2009. The adjustment is made following the same criteria used to make the adjustment relative to the 8 UIT. In this step, the amount assigned exclusively to the provincial municipality (the 20% allocation of the province) is also adjusted to be at least the amount assigned on 2009.[86]

[85] This legal "minimum" is established by the Article 33 of Legislative Decree No. 952 which modifies the Legislative Decree No. 776 – Municipal Taxation Law.

[86] The index that results from the third phase represents the allocation under a neutral scenario (B). The index also includes a pessimistic (A) and optimistic (C) scenario that are adjusted each year. In the case of 2014, the scenario A is when the monthly collection is less than 335 million of new soles, scenario B is when the monthly collection is between 335 and 373 million of new soles and scenario C when the monthly collection is higher than 373 million. The simulation has been performed for scenario B, in other words, the 373 million represents the pool of funds to which the index is applied.

2.5 Alternative methodology: incorporating fiscal capacity

As it is set in Figure 2.1, we proposed to include an index called "Fiscal Capacity Gap Index" (*FCGj*) in the first phase. The fiscal capacity is measured by all the transfers funds received at the province level (TR_j), including the Canon and other transfers of similar nature (but excluding the FCM itself) plus potential own revenues which are calculated using a regression analysis $(\widehat{IP_j})$. The components are further explained in what follows.

Transfers: We add all components of the item "transfers" (except for the FCM) received by each province. TR_j is the total transfers receive by province *j*, *n* is the number of districts that are part of province *j* and TR_k is total transfers receive by district *k*. TR_k represents the summation of all transfers received by district *k* which includes $Canon_k$;[87] and other transfers ($Others_k$).[88]

$$TR_j = \sum_{k=1}^{n} TR_k \qquad 2.9$$

Where: $TR_k = Canon_k + Others_k$

Estimating potential own revenues: we first calculate actual own revenues for each district *k*, then we estimate the per capita own revenues ($IPpc_k$). Owr_k and Pop_k are the own revenues and population of district *k*.

$$IPpc_k = \frac{Owr_k}{Pop_k} \qquad 2.10$$

Then, in order to estimate potential own revenues per capita we run a regression for all districts having as a dependent variable the own revenues per capita $IPpc_k$ and as an independent variable the average household private expenses in each district expressed in

[87] Summation of forest canon, gas canon, hydro-energetic canon, mining canon, fishing canon, oil canon and sobrecanon, mining royalties and custom duties.
[88] Includes other transfers like FOCAM, FONIE, participations and other transfers.

per capita terms.[89] We run this regression using the information for 2013, the year for which we have the most recent information (see Table 2.11). Subsequently, it is used the regression parameter to predict the values of the district own revenues per capita for the year of the analysis $\widehat{IPpc_k}$. In the case that the predicted value is negative, the district is assigned a value of zero. $\widehat{IPpc_k}$ is the predicted value of own revenues per capita of district *k*; $Gtoavgpc_k$ is the average household private expenses express in per capita terms for district *k* and $\widehat{IP_k}$ is the predicted value of own revenues of district *k*.

$$\widehat{IPpc_k} = \begin{cases} 0, if\ \widehat{IPpc_k} < 0 \\ 0.563 \times Gtoavgpc_k - 129.563, \quad otherwise \end{cases} \qquad 2.11$$

$$\widehat{IP_k} = \widehat{IPpc_k} \times Pop_k$$

To calculate the potential own revenues at the province level, we sum the predicted value of own revenues for all districts including the provincial municipality.

$$\widehat{IP_j} = \sum_{k=1}^{n} \widehat{IP_k} \qquad 2.12$$

The fiscal capacity of the province *j* is thus defined as the revenues coming from all transfers -except FCM (TR_j) plus the potential own revenues $\widehat{IP_j}$:

$$FC_j = TR_j + \widehat{IP_j} \qquad 2.13$$

$$FCpc_j = \frac{FC_j}{Pop_j} \qquad 2.14$$

Calculating the fiscal capacity gap (fcg_j): In this step we first calculate the national average fiscal capacity per capita ($FCpc_{na}$) and then we calculate the fiscal capacity gap per capita for each province relative to this national average as follows:

[89] This approach can be complemented by estimating the municipal own revenues using the provincial measure of household spending, plus municipal characteristics such as urbanization, altitude. The focus in this paper is to understand the fiscal variation within provinces and between-provinces.

$$fcg_j = \begin{cases} 0, if\ FCpc_{na} < FCpc_j \\ (FCpc_{na} - FCpc_j) \times Pop_j, if\ FCpc_{na} > FCpc_j \end{cases} \quad 2.15$$

Therefore, only the provinces that have a lower per capita fiscal capacity than the national average are eligible for this component of the index. The fiscal capacity index of the province (FCG_j) is defined as its share in the total fiscal capacity gap of all qualifying provinces.

$$FCG_j = \frac{fcg_j}{\sum_{j=1}^{196} fcg_j} \quad 2.16$$

Calculating the adjusted allocation index for the province (API_j): The information on the fiscal capacity gap index FCG_j is combined with the original provincial allocation index IGP_j to estimate the proposed provincial allocation index. Both criteria are pro-poor and other combinations of weights could be simulated to arrive to more (or less) redistributive outcomes. We give the original index IGP_j a weight of 70% and the added fiscal capacity index FCG_j a weight of 30%.

$$API_j = 0.7 \times IGP_j + 0.3 \times FCG_j \quad 2.17$$

2.6 Results

The paper analyses the fiscal disparities in revenue of local government due to the FCM under the current structure and the proposed alternative. The units of analysis are all the municipalities that received FCM in 2014. To evaluate the differences between the current and alternative allocation methodology of FCM, we estimate the Mean log deviation (I_0) and the Squared coefficient of variation (I_2).

The alternative methodology proposes province-level indicators for allocation of grants to districts; therefore, it ignores the within-province inequality. These measures allow to identify the disparities that happen between and within provinces; identify the

relative contribution of different revenue sources. In addition, they differ in their sensitivity to inequality in different parts of the distribution, while I_0 is most sensitive to disparities in the bottom range of the distribution, I_2 gives more weight to disparities in the upper tail of the distribution (Martinez-Vazquez & Timofeev, 2008).

2.6.1 Disparities in per capita revenue of local governments

We estimate and decompose the Mean log deviation $I_0 = I_0^b + I_0^w$: $\sum_j \frac{n_j}{N}\left(\ln \bar{y} - \ln \bar{y}_j\right) + \sum_j \sum_k \frac{n_{jk}}{N}\left(\ln \bar{y}_k - \ln y_{jk}\right)$ and the Squared coefficient of deviation $I_2 = I_2^b + I_2^w$: $\frac{1}{(N-1)\bar{y}^2}\sum_j n_j \left(\bar{y}_j - \bar{y}\right)^2 + \frac{1}{(N-1)\bar{y}^2}\sum_j \sum_k n_{jk}\left(y_{jk} - \bar{y}_k\right)^2$ where N is total population of the country; n_j is population of province *j*; n_{jk} is the population of district *k* in province *j*; $\bar{y}_j$ is province *j*'s mean value of variables y_{jk} and $\bar{y}$ is the grand mean of variable y_{jk}.

We use this structure to estimate I_0 and I_2 for 4 categories of revenues: own revenues; plus transfers; plus other revenues; and, plus FCM (see Table 2.12). The results confirm the great differences in per capita revenues before cumulatively adding the transfers and other revenues. Most of the disparity occurs within provinces, especially for own-source revenues. Even though the disparity is lessened after adding the transfers, the table shows the increase in the disparity between provinces. The disparities are lessened after the allocation of FCM, mostly on the disparities between provinces.

2.6.2 Effect of the alternative methodology

The effect of the inclusion of the fiscal capacity index in the FCM formula depends on the application of the no harm measure or "floor value" adjustments done in the third phase. With the current formula of FCM, the allocation index (the second phase), changes when the floor value adjustments are implemented (third phase). For example, the district of Yarabamba (located in the province of Arequipa in Arequipa region) should receive

29,560 new sols as a monthly assignment for FCM if we applied the index that results from the second phase. However, that amount is less than the 8 UIT and the adjusted amount they received in 2009. So in the end, the district receives 30,800 new sols (the adjusted amount they received in 2009).

Our initial alternative (Alt 2.4) only affects the allocation corresponding to the first phase; however, after performing the third phase allocation adjustment, it is hard to guarantee that the allocation corresponding to the first remains. In order to extend the analysis we add three more alternatives that consider the variation in the first phase and variations in the application of the third phase. The alternative 2.1 (Alt 2.1) corresponds to the case where none of the no-harm criteria is applied; the alternative 2.2 (Alt 2.2) represents the case where only the floor value of the adjusted allocation on 2009 is applied; and, the alternative 2.3 (Alt 2.3) represents the case where only the floor value of 8 UIT is applied. The Table 2.13 shows the disparities in per capita revenues after applying the current formula of FCM and the alternatives. All the alternatives seem to marginal lessened the disparities between provinces relative to the current formula of FCM; however, they also increase the disparities within provinces.

2.7 Conclusions

An intergovernmental transfer system is an important component of the fiscal decentralization policy; however, it is not immune to present contradictory effects. This paper aimed at investigating how revenue-sharing and equalization transfers affect fiscal disparities considering the case of Peruvian local governments. Both transfers have a significant weight in their budget, but the design of the revenue-sharing transfer -allocated on a derivation basis- has caused an increased in the disparity among local governments.

Considering the great political cost involved in adjusting the revenue-sharing transfer, a possible strategy is to look for an indirect reform by adjusting the equalization transfer. The paper investigated whether fiscal disparities among districts can be reduced when the allocation formula of the equalization transfer is modified by incorporating a revenue capacity component and by removing the “no harmful” adjustment steps.

The alternatives indicate a reduction in the disparities between and within provinces in the lower tail of the distribution (I_0), but they increased the disparity within provinces in the upper tail (I_2). The results are expected considering that the alternatives are meant to adjust only the amount that is allocated to the province. Future research can include other variables to increase the explanatory power of the model use to estimate the potential revenues of the districts as well as considering adjustments in the allocation within the province.

Table 2.1 Allocation of responsibilities by level of government

	Central government	Regional governments	Local governments
Exclusive	Foreign relations Defense, national security, and armed forces Justice, with the exception of Justice administration Internal order, national and border police 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 in accordance with the Constitution Design and supervision of national and sectoral policies, which are compulsory for all levels of government	Regional development plans and executing corresponding socio-economic programs 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	Urban and rural municipal development Management and regulation of local public services Internal organization of the local government Local development plan Execution and monitoring of local public infrastructure
Shared	All other responsibilities	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	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)

Table 2.2 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 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 et al., 2010).

Table 2.3 Revenue composition of local governments, 2004-2014 (as % 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/0	0.23	0.25	0.22	0.30	0.32	0.33	0.34	0.35	0.39	0.41	0.39
Other tax revenues	0.06	0.05	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.06	0.05
Nontax revenues/1	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/2	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 transfers	0.33	0.20	0.05	0.16	0.22	0.09	0.37	0.35	0.28	0.28	0.25
Capital revenues/3	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

/0 includes vehicle property, property transfer and land and buildings property.
/1 Includes fees, rental of property, service charges, sales of goods, fines and others.
/2 includes canon, sobrecanon, royalties, customs duties and concession rights.
/3 Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table 2.4 Revenue structure of local governments, 2004-2014 (%)

	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/0	9	9	8	8	9	10	10	10	10	12	12
Other tax revenues	2	2	1	1	1	2	1	1	1	2	2
Nontax revenues/1	24	23	18	14	15	18	14	14	14	14	13
Transfers	58	63	68	75	72	64	67	71	69	68	65
Canon/2	15	25	35	47	41	36	33	39	40	36	32
FCM	30	30	31	24	25	25	23	22	22	24	25
Other transfers	13	8	2	4	6	3	11	10	8	8	7
Capital revenues/3	6	3	4	3	3	6	7	4	5	5	9
Total	100	100	100	100	100	100	100	100	100	100	100

/0 includes vehicle property, property transfer and land and buildings property.
/1 Includes fees, rental of property, service charges, sales of goods, fines and others.
/2 includes canon, sobrecanon, royalties, customs duties and concession rights.
/3 Includes sales of assets and capital transfers.
Source: Ministry of Finance.

Table 2.5 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 2.6 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 2.7 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 districts where the provincial municipality is located.

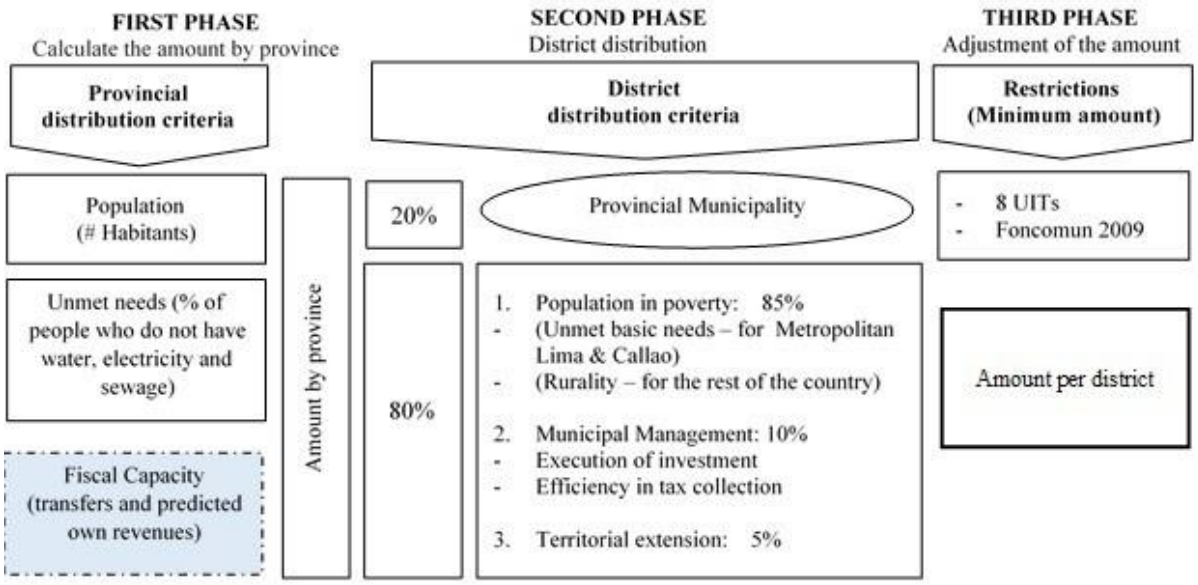
Source: Ministry of Finance.

Table 2.8 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

Figure 2.1 Current and alternative methodology to distribute the FCM



Note: The box in light blue represents the proposed adjustment to incorporate fiscal capacity in the formula.

Table 2.9 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 are applicable 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 Huanuco.
Source: (Canavire-Bacarreza et al., 2012) and Law No. 27506 (Law on the Canon).

Table 2.10 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 2.11 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

Table 2.12 Disparities in local governments revenue (per capita) within and between provinces, 2014

	Own-source	Plus transfers	Plus other revenues	Plus FCM
Square coefficient of variation (I_2)	6.623	3.569	3.204	1.974
Within provinces	6.039	1.708	1.723	1.074
Between provinces	0.584	1.861	1.481	0.899
Mean log deviation (I_0)	1.005	0.578	0.590	0.408
Within provinces	0.598	0.316	0.361	0.251
Between provinces	0.413	0.262	0.229	0.155

Source: Ministry of Finance.

Table 2.13 Changes in disparities in local governments revenue (per capita) within and between provinces using the alternative allocations of FCM, 2014

	Plus FCM	Alt 2.1	Alt 2.2	Alt 2.3	Alt 2.4
Square coefficient of variation (I_2)	1.974	1.945	1.968	1.960	1.967
Within provinces	1.074	1.113	1.117	1.119	1.117
Between provinces	0.899	0.833	0.851	0.841	0.850
Mean log deviation (I_0)	0.408	0.366	0.375	0.371	0.375
Within provinces	0.251	0.234	0.237	0.236	0.237
Between provinces	0.155	0.133	0.139	0.135	0.138

Source: Ministry of Finance.

REFERENCES

Ackerman, J. (2004). Co-Governance for Accountability: Beyond "Exit" and "Voice". *World Development, 32*(3), 447-463. doi: http://dx.doi.org/10.1016/j.worlddev.2003.06.015

Adsera, A., Boix, C., & Payne, M. (2003). Are you being served? Political accountability and quality of government. *Journal of Law, Economics, and organization, 19*(2), 445-490.

Ahmad, E., & Brosio, G. (2008). *Political economy of multi-level tax assignments in Latin American countries: earmarked revenue versus tax autonomy*: International Monetary Fund.

Ahmad, E., & García-Escribano, M. (2011). Constraints to Effective Fiscal Decentralization in Peru *Decentralization in Developing Countries*: Edward Elgar Publishing.

Akhmedov, A., & Zhuravskaya, E. (2004). Opportunistic political cycles: test in a young democracy setting. *The Quarterly Journal of Economics, 119*(4), 1301-1338.

Alfaro, J., & Rühling, M. (2007). La incidencia de los Gobiernos Locales en el Impuesto Predial en el Perú. *Lima, Peru: Instituto de Investigación y Capacitación Municipal (INICAM).*

Altman, D. (2002). Prospects for e-government in Latin America: Satisfaction with democracy, social accountability, and direct democracy. *International review of public administration, 7*(2), 5-20.

Alvarado, B., Rivera, B., Porras, J., & Vigil, A. (2003). Transferencias intergubernamentales en las finanzas municipales del Perú. *Lima: CIUP, CIES, USAID*.

Alvarado Pérez, B. M. (1994). Relaciones Fiscales entre el gobierno central y los gobiernos locales. *Fundación Friedrich Ebert, Lima*.

Ammons, D. N. (1997). A Brief Guide for Performance Measurement in Local Government. *New Brunswick, NJ: National Center of Public Productivity, Rutgers University*.

Anderson, C. J. (2007). The end of economic voting? Contingency dilemmas and the limits of democratic accountability. *Annual Review of Political Science, 10*, 271-296.

Aragon, F., Makarin, A., & Pique, R. (2015). National Parties and Local Development: Evidence from Peruvian Municipalities.

Aragón, F. M., & Gayoso, V. J. (2005). Intergovernmental transfers and fiscal effort in Peruvian local governments.

Arikan, G. G. (2004). Fiscal decentralization: A remedy for corruption? *International Tax and Public Finance, 11*(2), 175-195.

Asatryan, Z., Feld, L. P., & Geys, B. (2012). Partial fiscal decentralization and sub-national government fiscal discipline: empirical evidence from OECD countries. *Public Choice*, 1-14.

Bahl, R., & Linn, J. (1992). *Urban Public Finance in Developing Countries*: Oxford University Press, New York.

Bahl, R., & Martinez-Vazquez, J. (2013). Sequencing Fiscal Decentralization. *Annals of Economics and Finance, 14*(2), 641-687.

Bardhan, P. (2002). Decentralization of governance and development. *Journal of Economic perspectives*, 185-205.

Bardhan, P., & Mookherjee, D. (2006). Decentralization, corruption, and government accountability. *International handbook on the economics of corruption*, 161-188.

Barro, R. J. (1973). The control of politicians: an economic model. *Public Choice, 14*(1), 19-42.

Benito, B., & Bastida, F. (2009). Budget transparency, fiscal performance, and political turnout: An international approach. *Public Administration Review, 69*(3), 403-417.

Berry, C. R., & Howell, W. G. (2007). Accountability and Local Elections: Rethinking Retrospective Voting. *Journal of Politics, 69*(3), 844-858. doi: 10.1111/j.1468-2508.2007.00579.x

Bird, R. M. (2009). Tax assignment revisited. *Tax reform in the 21st century*, 441-470.

Bird, R. M. (2011). Subnational taxation in developing countries: a review of the literature. *Journal of International Commerce, Economics and Policy, 2*(01), 139-161.

Block, S. A. (2002). *Elections, electoral competitiveness, and political budget cycles in developing countries*: Center for International Development, Harvard University.

Boex, J., & Martinez-Vazquez, J. (2007). Designing intergovernmental equalization transfers with imperfect data: Concepts, practices, and lessons *Fiscal Equalization* (pp. 291-343): Springer.

Borge, L.-E. (2010). *Local Equalization Grants: Purpose, Efficiency Effects, and Design.* Paper presented at the Presentation at 6th Symposium on Fiscal Federalism: Financing Local Governments, Barcelona.

Bovens, M. (2005). Public Accountability *The Oxford handbook of public management*: Oxford Handbooks Online.

Bowler, S. (2004). Recall and Representation Arnold Schwarzenegger Meets Edmund Burke. *Representation, 40*(3), 200-212.

Brender, A. (2003). The effect of fiscal performance on local government election results in Israel: 1989–1998. *Journal of Public Economics, 87*(9-10), 2187-2205.

Bromberg, D. (2009). Performance Measurement. *Public Performance & Management Review, 33*(2), 214-221. doi: 10.2753/PMR1530-9576330202
Canavire-Bacarreza, G., Martinez-Vazquez, J., & Sepulveda, C. (2012). Sub-national Revenue Mobilization in Peru: IDB Working Paper Series.
Carlin, R. E., & Singh, S. P. (2015). Executive Power and Economic Accountability. *The Journal of Politics, 77*(4), 1031-1044.
Carnevale, A. P., & Carnevale, D. G. (1993). Public administration and the evolving world of work. *Public Productivity & Management Review*, 1-14.
CGP. (2014). Estudio del proceso de descentralización en el Perú [Study of the decentralization process in Peru]: Contraloría General de la República de Perú Lima.
Consejo Nacional de Educación. (2010). Balance y Propuestas para avanzar en la Descentralización Educativa.
Crabtree, J. (2010). Democracy without parties? Some lessons from Peru. *Journal of Latin American Studies, 42*(2), 357-382.
Cueto, S. (2004). Factors Predicting Achievement, Drop Out And High School Enrollment In A Sample Of Peruvian Rural Students. *education policy analysis archives, 12*, 35.
DuPont-Morales, M., & Harris, J. E. (1994). Strengthening accountability: Incorporating strategic planning and performance measurement into budgeting. *Public Productivity & Management Review*, 231-239.
Eaton, K., & Schroeder, L. (2010). Measuring decentralization. *Making decentralization work: Democracy, development, and security*, 167-190.
Escobar-Lemmon, M., & Ross, A. D. (2014). Does decentralization improve perceptions of accountability? Attitudinal evidence from Colombia. *American Journal of Political Science, 58*(1), 175-188.
Fan, C. S., Lin, C., & Treisman, D. (2009). Political decentralization and corruption: Evidence from around the world. *Journal of Public Economics, 93*(1-2), 14-34.
Feld, L. P., & Savioz, M. R. (1997). Direct democracy matters for economic performance: an empirical investigation. *Kyklos, 50*(4), 507-538.
Garman, C., Haggard, S., & Willis, E. (2001). Fiscal decentralization: A political theory with Latin American cases. *World Politics, 53*(2), 205-236.
Gélineau, F. (2013). Electoral accountability in the developing world. *Electoral Studies, 32*(3), 418-424.
Gélineau, F., & Remmer, K. L. (2006). Political decentralization and electoral accountability: The Argentine experience, 1983–2001. *British Journal of Political Science, 36*(01), 133-157.
Gomez, J. L., Martinez-Vazquez, J., & Sepulveda, C. (2010). Abriendo espacios fiscales: la descentralización de fuentes de ingresos y el desarrollo de la capacidad recaudatoria de los Gobiernos Regionales y Municipales en Perú.: Corporación Andina de Fomento and Georgia State University.
INEI. (2013). Informe Técnico - Evolución de la Pobreza Monetaria 2007-2012 [Technical Report-Evolution of monetary poverty 2007-2012].
INEI. (2016). Informe Técnico - Evolución de la Pobreza Monetaria 2009-2015 [Technical Report-Evolution of monetary poverty 2009-2015].
INFOGOB-JNE. Observatorio para la Gobernabilidad [Governance Observatory dataset]. Retrieved November, 2017
Kim, S. H. (1992). The political process of decentralization in Peru, 1985–1990. *Public administration and development, 12*(3), 249-265.
Lago-Peñas, I., & Lago-Peñas, S. (2010). Decentralization and electoral accountability. *Environment and Planning C: Government and Policy, 28*(2), 318-334.
Lewis-Beck, M. S., & Nadeau, R. (2011). Economic voting theory: Testing new dimensions. *Electoral Studies, 30*(2), 288-294.
Litschig, S., & Morrison, K. (2012). Government Spending and Re-election: Quasi-Experimental Evidence from Brazilian Municipalities.
Loayza, N., Mier y Teran, A., & Rigolini, J. (2013). Poverty, inequality, and the local natural resource curse.
Martinez-Vazquez, J. (2013). Fiscal decentralization in Peru: A perspective on recent developments and future challenges.
Martinez-Vazquez, J., & Sepúlveda, C. (2008). The Municipal Transfer System in Nicaragua: Evaluation and Proposals for Reform: International Center for Public Policy (formerly the International Studies Program), Andrew Young School of Policy Studies, Georgia State University.
Martinez-Vazquez, J., & Sepulveda, C. F. (2011a). Explaining Property Tax Collections in Developing Countries: The Case of Latin America: International Center for Public Policy (formerly the International Studies Program), Andrew Young School of Policy Studies, Georgia State University.
Martinez-Vazquez, J., & Sepulveda, C. F. (2011b). Intergovernmental Transfers in Latin America: A Policy Reform Perspective.
Martinez-Vazquez, J., & Timofeev, A. (2008). Regional-local dimension of Russia's fiscal equalization. *Journal of Comparative Economics, 36*(1), 157-176.

Martinez-Vazquez, J., Lago-Peñas, S., & Sacchi, A. (2017). The impact of fiscal decentralization: A survey. *Journal of Economic Surveys, 31*(4), 1095-1129.
MEF. (2011). El Sistema Nacional de Presupuesto - Guía Básica [The national budgetary system - basic guide].
Melkers, J., & Willoughby, K. (2005). Models of Performance-Measurement Use in Local Governments: Understanding Budgeting, Communication, and Lasting Effects. *Public Administration Review, 65*(2), 180-190.
MINAM. (2013). Report: Diagnosis of Solid Waste in Peru.
MINAM. (2014). Sexto Informe Nacional de Residuos Sólidos de la Gestión del Ámbito Municipal y No Municipal [Sixth National Report on Municipal and Non-Municipal Solid Waste Management].
MINAM. (2016a). Mapa de vulnerabilidad fisica del Peru [Map of physical vulnerability of Peru].
MINAM. (2016b). Plan Nacional de Gestión Integral de Residuos Sólidos 2016–2024 [National Integrated Solid Waste Management Strategy 2016-2024].
Morgenstern, S., & Green, A. T. (2009). *Peru: Assessment Report for Political Parties and Party Systems*: Pittsburgh: University of Pittsburgh.
Musgrave, R. A. (1959). *The theory of public finance; a study in public economy*: New York, McGraw-Hill, 1959.
Nordhaus, W. D. (1975). The political business cycle. *The Review of economic studies, 42*(2), 169-190.
Oates, W. E. (1972). Fiscal federalism.
Oates, W. E. (1999). An essay on fiscal federalism. *Journal of economic literature*, 1120-1149.
Oates, W. E. (2005). Toward A Second-Generation Theory of Fiscal Federalism. *International Tax and Public Finance, 12*(4), 349-373. doi: 10.1007/s10797-005-1619-9
OECD. Revenue Statistics - Latin American Countries: Comparative tables. Retrieved March, 2017, from http://stats.oecd.org/
OECD. (2016). *Regulatory Policy in Peru*: OECD Publishing.
OECD/ECLAC. (2017). *OECD Environmental Performance Reviews: Peru 2017*: OECD Publishing.
OEFA. Informe 2013-2014. Indice de cumplimiento de los municipios provinciales a nivel nacional.
ONPE. (2010). Consultas populares de revocatoria 1997-2009 y nuevas elecciones municipales 2005-2010 [Recall processes 1997-2009 and new municipal elections 2005-2010]. *Reporte de procesos y consultas*.
ONPE. (2013a). Consulta popular de revocatoria del mandato de autoridades municipales de Marzo 2013 [Recall process of local authorities of March 2013]. *Documento de Gestion*.
ONPE. (2013b). Nuevas Elecciones Municipales y Segunda Consulta Popular de Revocatoria del Mandato de Autoridades Municipales Julio 2013. *Reporte de procesos y consultas*.
Paler, L. (2013). Keeping the public purse: An experiment in windfalls, taxes, and the incentives to restrain government. *American Political Science Review, 107*(04), 706-725.
Peltzman, S. (1992). Voters as Fiscal Conservatives. *The Quarterly Journal of Economics, 107*(2), 327-361. doi: 10.2307/2118475
PISA, O. (2010). Results: What Students Know and Can Do—Student Performance in Reading, Mathematics and Science (Volume I). *Paris: Organisation for Economic Cooperation and Development*.
Qvortrup, M. (2011). Hasta la vista: a comparative institutionalist analysis of the recall. *Representation, 47*(2), 161-170.
Rabanal Sobrino, J. P., & Castillo, K. M. (2006). Perú: ¿Esfuerzo o pereza fiscal en los Gobiernos locales? 1999-2004. *Documento de Trabajo N. º 03/2006*.
Reschovsky, A. (2007). Compensating local governments for differences in expenditure needs in a horizontal fiscal equalization program. *Chapter, 14*, 397-424.
Rodden, J. (2002). The dilemma of fiscal federalism: grants and fiscal performance around the world. *American Journal of Political Science*, 670-687.
Rogoff, K. S. (1990). Equilibrium political budget cycles. *The American economic review, 80*, 21-36.
Rondinelli, D. A., McCullough, J. S., & Johnson, R. W. (1989). Analyzing decentralization policies in developing countries: A political-economy framework. *Development and change, 20*(1), 57-87.
Rosenberg, J. (1992). Rationality and the political business cycle: The case of local government. *Public Choice, 73*(1), 71-81. doi: 10.1007/bf00142917
Ross, M. L. (2001). Does oil hinder democracy? *World Politics, 53*(3), 325-361.
Ross, M. L. (2012). *The oil curse: How petroleum wealth shapes the development of nations*: Princeton University Press.
Rubin, I. (1996). Budgeting for Accountability: Municipal Budgeting for the 1990s. *Public Budgeting & Finance, 16*(2), 112-132. doi: 10.1111/1540-5850.01071
Samuels, D., & Hellwig, T. (2010). Elections and accountability for the economy: a conceptual and empirical reassessment. *Journal of Elections, Public Opinion and Parties, 20*(4), 393-419.
Schmitter, P. C., & Karl, T. L. (1991). What democracy is... and is not. *Journal of democracy, 2*(3), 75-88.
Schroeder, L., & Smoke, P. (2003). Intergovernmental fiscal transfers: concepts, international practice, and policy issues. *Intergovernmental Fiscal Transfers in Asia: Current Practice and Challenges for the Future*, 20.

Seabright, P. (1996). Accountability and decentralisation in government: An incomplete contracts model. *European Economic Review, 40*(1), 61-89. doi: http://dx.doi.org/10.1016/0014-2921(95)00055-0
Stein, R. M. (1990). Economic voting for governor and US senator: the electoral consequences of federalism. *The Journal of Politics, 52*(1), 29-53.
Tiebout, C. M. (1956). A pure theory of local expenditures. *The journal of political economy, 64*(5), 416-424.
Timmons, J. F., & Garfias, F. (2015). Revealed corruption, taxation, and fiscal accountability: Evidence from Brazil. *World Development, 70*, 13-27.
Veiga, L. G., & Veiga, F. J. (2007). Political business cycles at the municipal level. *Public Choice, 131*(1), 45-64. doi: 10.1007/s11127-006-9104-2
Weingast, B. R. (1995). The economic role of political institutions: Market-preserving federalism and economic development. *Journal of Law, Economics, & Organization*, 1-31.
Weingast, B. R. (2009). Second generation fiscal federalism: The implications of fiscal incentives. *Journal of Urban Economics, 65*(3), 279-293. doi: http://dx.doi.org/10.1016/j.jue.2008.12.005
Welp, Y. (2016). Recall referendums in Peruvian municipalities: a political weapon for bad losers or an instrument of accountability? *Democratization, 23*(7), 1162-1179. doi: 10.1080/13510347.2015.1060222
Willoughby, K. G. (2004). Performance measurement and budget balancing: State government perspective. *Public Budgeting & Finance, 24*(2), 21-39.
World Bank. (2010a). Perú: Descentralización y Presupuesto por Resultados en Educación [Peru: Decentralization and Results-Based Budget in Education]. *Balance de la última década*.
World Bank. (2010b). Peru: The Decentralization Process and Its Links with Public Expenditure Efficiency. *World Bank Other Operational Studies*. http://EconPapers.repec.org/RePEc:wbk:wboper:12894
Yilmaz, S. (1999). *The impact of fiscal decentralization on macroeconomic performance.* Paper presented at the Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association.
Yilmaz, S. (2009). *Local government discretion and accountability: Application of a local governance framework*: World bank.

VITA

Linda Janet Porras Mendoza was born in Lima, Peru, the 27th of June 1978. She holds a Bachelor of Arts in Economics from Universidad del Pacifico in Lima, Peru and a Master of Arts in Economics from Georgia State University.

Janet began Georgia State's Doctoral program in 2011 to study Public Finance and Budgeting. She has worked as a graduate research assistant for Dr. Jorge Martinez-Vazquez. During her doctoral program, Janet taught a graduate microeconomics course and an undergraduate statistics course at Georgia State University. Janet has also worked as a consultant for the World Bank.

Prior to beginning her graduate studies, Janet worked as a research assistant in the Universidad del Pacifico Research Center. In this research center, she participated in consultancy and research projects in the topics of monitoring and evaluation of budget performance. She co-authored the book "Intergovernmental transference in Municipal Finance of Peru" (in Spanish). She also worked as an advisor for the Vice Minister in the Ministry of Women and Social Development from 2004 to 2006.

Janet received her Doctor of Philosophy degree in Public Management and Policy from Georgia State University in the spring of 2018.