CAN A MINING WINDFALL IMPROVE WELFARE? EVIDENCE FROM PERU WITH MUNICIPAL LEVEL DATA

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¿PUEDE LA RENTA MINERA MEJORAR EL BIENESTAR? EVIDENCIAS EN PERU CON DATA A NIVEL MUNICIPAL
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RESUMEN

En este trabajo se investiga si los resultados fiscales son afectados por la presencia de ingresos provenientes de los recursos naturales. Se compara los resultados en la provisión de bienes públicos entre los municipios ricos en recursos minerales y aquellos que no lo son en Perú, antes y después del incremento sustancial en el canon minero. Se usó un enfoque de diferencias en diferencias con data a nivel municipal, aprovechando la exogeneidad de las transferencias del canon minero. Los resultados no son consistentes con una diferencia significativa en términos de provisión de bienes públicos entre aquellos municipios que reciben canon minero y aquellos que no. Tampoco se encontró que una mayor participación ciudadana en los procesos presupuestarios municipales altera los resultados. Las regiones ricas en recursos naturales no parecen haber cosechado el beneficio de las ganancias extraordinarias.

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ABSTRACT

In this paper we investigate whether fiscal performance is affected by the presence of natural resource revenues. We compare policy outcomes from mineral-abundant municipalities and non mineral-abundant municipalities in Peru, before and after the mining windfall. We use a difference in difference approach with municipal-level data, profiting from the exogeneity of mining canon transfers. Our findings are not consistent with a significant difference in terms of public goods provisioning between canon recipient governments and non-recipient governments. We do not find that citizen participation in public governance alter these results. Mineral rich regions do not seem to be reaping the benefit of the windfall.

JEL Classification: P48, H30

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Can a Mining Windfall Improve Welfare? Evidence from Peru with municipal level data.

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Abstract

In this paper we investigate whether fiscal performance is affected by the presence of natural resource revenues. We compare policy outcomes from mineral-abundant municipalities and non mineral-abundant municipalities in Peru, before and after the mining windfall. We use a difference in differences approach with municipal-level data, profiting from the exogeneity of mining canon transfers. Our findings are not consistent with a significant difference in terms of public goods provisioning between canon recipient governments and non-recipient governments. We do not find that citizen participation in public governance alter these results. Mineral rich regions do not seem to be reaping the benefit of the windfall. JEL Classification: P48, H30

1. Introduction

The exploitation of non-renewable natural resources can originate considerable rents in resource abundant countries. The resource windfall over the last decade was considerable for commodity producers. For instance, fiscal revenues from natural resources escalated from 4.8% of GDP to 11.1% of GDP for the average commodity producer in Latin America between 2002 and 2008. The appropriation of a fraction—or even the totality—of such rents relaxes the budget constraint and allows governments to increase spending and/or savings, which should have positive welfare implications. But the international experience suggests that resource abundance is not always conducive to higher economic development.

A growing body of literature, stresses that institutions are crucial determinants of what countries or regions ultimately do with natural resources. In the presence of weak budget institutions and low quality governance, resource windfall revenues can be deviated from the adequate provision of public goods to rent-seeking activities by interest groups. On the other hand, if governments largely rely on resource rents to finance the budget—instead of personal and corporate taxes— the incentives to be fiscally accountable may be reduced. For citizens, in turn, the cost of public goods in terms of their taxes can be blurred if the government counts with an alternative source of funding, which may limit their willingness to monitor the government's actions with negative consequences for the quality of public goods.

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Recent country-level evidence suggests that resource abundant countries that strongly rely on resource rents to finance government spending are not better off in terms of the quality of governance and policy outcomes than other countries[2]. Nonetheless, cross-country econometric exercises have some caveats. Omitted variables (cultural traits and institutions) can affect not only the policy outcome (the dependant variable) but also the variables commonly used to measure resource abundance or fiscal dependency on resource-related fiscal income (the regressors), creating an endogeneity bias. Poor governance and weak property rights, for instance, may deteriorate the quality of public policies and policy outcomes while, at the same time, prevent the government from developing capabilities to tax other activities, increasing fiscal dependency on resource related revenues. Therefore, inference about causality is not clear-cut. By resorting to sub-national data one can circumvent some of these problems. This is because cross-section units (states, municipalities, counties, etc.) tend to be more homogeneous, keeping constant some of the non-observable differences across countries, allowing for more reliable inferences.

Moreover, local governments in Latin America are increasingly participating in the provision of basic health care and education, public sanitation, road construction and maintenance, among others. In spite of this, state and municipal taxing capabilities and systems remain underdeveloped. Therefore, local governments rely on central government transfers to finance spending. On average, central government transfers represent nearly 70% of total municipal revenues in Latin America[3]. Resource related transfers have gained participation in recent years. A predominant allocation criterion is to largely benefit those states or municipalities were rigs or mines are located.

An increasing line of research empirically examines the incidence of natural resource rents on spending decisions, spending efficiency and transparency of the budget process with regional and local-level data. These studies exploit the exogenous component of the transfers to regional entities related to the geographic distribution of mines and rigs within countries[4], which is largely independent of other transfers that depend upon state or municipal characteristics. These studies generally use a difference in differences approach to evaluate changes in time between resource-abundant regions compared to the rest.

In this paper we investigate whether fiscal performance is affected by the presence of resource related revenues. We compare policy outcomes from mineral-abundant municipalities, entitled to the mining canon, and non mineral-abundant municipalities

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[2] Perry *et al.* (2011) examine whether resource abundant countries that largely depend on resource-related revenues perform differently in terms of fiscal spending, spending allocation, spending outcomes, and fiscal transparency, among others.

[3] See Eguino *et al.* (2010) for a detailed analysis of municipal-level revenue and spending structure in Latin America.

[4] See, for instance, Caselli and Michaels (2011); Ferraz and Monteiro (2011) for Brazil; and Gelmur y and Pochat for Argentina.

that do not receive the mining canon, before and after the mining windfall. We use a difference in differences approach with municipal level data, profiting from the exogeneity of the mining canon transfers. According to the Peruvian Mining Canon Law, a fraction of the windfall must be transferred to local governments in municipalities where mining activities are located, regardless of other local conditions. We find that although canon recipient governments spent more money during the windfall than non-recipient governments (Sanguinetti, 2010), the results do not support a significant difference in terms of public goods provisioning between both groups of municipalities. We do not find that citizen participation in public governance alter these results. This variable may be measured with error though.

This paper has 5 sections, including this brief introduction. In the next section we develop a conceptual framework. In the third section we present the recent evolution of mining revenues in Peru and describe the canon law and the recent evolution of canon transfers. In the fourth section we present our empirical strategy and results. The final section concludes.

2. Conceptual framework

The seminal finding by Sachs and Warner (1997, 2001) that, on average, resource abundant countries grow less has inspired an extensive literature that attempts to explain this apparently counterintuitive fact, dubbed as the resource curse. Initially, explanations centered in the mechanism through Dutch Disease. Essentially, a resource windfall causes an appreciation of the exchange rate that reduces the competitiveness of tradable sector and hinders domestic production[5]. Later research does not find robust evidence to support a negative correlation between resource abundance and growth, highlighting the possibility that other variables condition this relationship[6]. For instance, an increasing number of studies elaborate on the idea that institutions condition the interplay between resource abundance and development[7].

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[5] An additional assumption in this hypothesis is that the tradable sector has a larger impact on development (e.g. through more spillover effects), so that its contraction will have further deleterious effects on growth. See Forsyth and Kay (1980, 1981) and Corden and Neary (1982).

[6] More recent findings, e.g. Lederman and Maloney (2007), contradicting Sachs and Warner's results cast shadows on the conclusiveness of the empirical validity of the resource curse. See also Manzano and Rigobón (2001); Lederman and Maloney (2007); Brunnschweiler and Bulte (2008); and van der Ploeg and Poelhekke (2009)

[7] This literature highlights that natural resources can be a blessing in strong institutional settings. Instead, institutional settings with scant checks and balances that grant an ample margin for discretionality may lead to sub-optimal use for natural resources. For instance, in less democratic regimes with weak institutions, a resource windfall can elicit rent seeking, increase corruption, and further deteriorate institutions and governance. On the other hand, underdeveloped domestic financial

One argument within this line of research is that if the institutional framework inhibits citizen participation and control on governance, a resource windfall can lead to poor public policies[8]. This is based on the assumption that when fiscal revenues depend more on direct taxation to individuals and firms, they can form a better idea of the cost of public goods provision in terms of the taxes they pay. This should stimulate taxpayers to monitor public governance more closely, in order to guarantee a good use of their taxes. Taxpayers can do this directly or indirectly through their representatives (e.g. in parliament, local assemblies, etc.). Therefore, taxpayers become important players in public governance and budget processes, which should improve government performance and thus incentive contributors to keep paying (or pay more) taxes. This is a virtuous circle between taxes, citizen participation on budget decisions, governance and the quality of public policies.

Alternatively, if the public sector has funding sources other than tax revenues levied on a broad base of citizens and firms, taxpayers may be less motivated to monitor public budget processes, since to budget decisions have less direct and less visible consequences on their net income. Consequently, there will be fewer incentives for the government to improve the quality of public policies. The lack of connection between budget decisions and income sources can be significant in resource abundant countries or regions, especially in those endowed with non-renewable resources such as mining and hydrocarbons.

First, the exploitation of non-renewable natural resources is associated with large profit margins, particularly when commodity prices soar. This marks a considerable difference between tax revenues from other economic activities and resource-related fiscal revenues --taxes, fees, royalties, windfall taxes, dividends, among others (Dalgaard y Olsson, 2006). Apart from the size of resource-related rents, the production of natural resources is characterized by large economies of scale, so that taxes are usually concentrated in a small number of firms with large profits. This may further distance citizens from the tax process management, since a large fraction of government revenues does not come from taxpayers' pockets, which may prompt the aforementioned mechanism of fewer incentives for citizen participation, low quality governance, poor public policies and less willingness to pay taxes.

Second, even though a relatively smaller tax burden may diminish the incentives for citizen participation, it could be argued that, in any event, taxpayers should still be interested in knowing how the government handles resource-related revenues. Nonetheless, there may be some transparency issues regarding natural resources

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markets and limited access to international markets hinder the ability of countries to smooth out volatile resource rents. See van der Ploeg (2011) for a detailed analysis of these and other hypothesis.
8 See, for instance, Sala-i-Martin and Subramanian (2003); Mehlum *et al*. (2006); Robinson *et al*. (2006); Arezki and van der Ploeg (2007); and van der Ploeg and Venables (2010).

revenues that difficult it. This would be the case if, for example, publicly disclosed information about resource-related revenues is scarce and not timely, or if revenues are directly deployed to funds not linked to the budget with obscure management criteria. In other words, resource revenues can be directly deployed to government funds through non-transparent off-budget operations that impede access to information (Farejohn, 1986). This would hinder actions by control instances, as well as independent auditing for the regular budget process. Lack of transparency can then be an additional element that conditions the quality of governance and public policies.

Third, volatility is a trademark of resource-related income. Commodity price fluctuations explain this. On the other hand, the progressive exhaustion of non-renewable resources limits the horizon of the rents. Considering then that a part of the windfall is temporary, governments should aim to reinvest part of the rent in financial assets, physical capital or human capital, so that their stream of returns compensate for the decline of the rents as the resource depletes or provide a buffer against price shocks. This is to facilitate consumption smoothing. In other words, fluctuations in resource-related revenues should not be transferred to government spending. Nonetheless, if there are political competition problems and the institutional backdrop is weak, the government may be tempted to deploy resources to current spending to increase present consumption, rather than investing[9], against an efficient allocation of resources in time and across activities. This, of course, entails efficiency and welfare losses.

If lack of transparency obstructs the proper surveillance of the budget process and the incumbent is believed to be inefficient or corrupt, it would be rational for agents to favor government spending that directly increases household income (e.g. transfers), as opposed to public investment. The incumbent would then have further incentives to redirect spending to present consumption, in order to allure voters and remain in power. This would prevent not only an efficient intertemporal allocation of resources but also an efficient allocation across activities, since public investment may have larger returns than current spending for present consumption[10].

Fourth, a resource windfall can induce rent seekers to fight within and between interest groups to seize the rent. This can potentially increase conflict, aggravate governability problems, deteriorate the rule of law, weaken property rights and elevate confiscation risks, with negative implications for governance and the quality of public policies (Cárdenas *et al.*, 2011). In extreme cases, the fights for rent appropriation can lead to armed conflict (Collier y Hoffler, 2004).

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[9] Lane and Tornell (1996) and van der Ploeg (2011).

[10] Alesina *et al.* (2008) argue that fiscal policy becomes prociclycal if there are asymmetries of information and corrupt governance. Ardanaz (2011) explores the sources of information problems that exacerbate prociclicality. This logic can be extended to the allocation across activities as well.

Summing up, there are several mechanisms that can explain why resource windfalls can negatively affect the quality of public governance and policy outcomes. In the following sections we examine the empirical evidence for Peru to assess whether the recent windfall has had any effect on public policy outcomes.

3. Mining canon in Peru

Mineral production in Peru comprises precious metals—gold and silver—and basic metals—copper, tin, zinc, lead, and molybdenum. The sharp rise in international metal prices since 2003 (Figure 1) resulted in a substantial increase of the contribution of mining activities to growth, exports and fiscal revenues. Mining activities currently represent around 5% of Peru's GDP.

Figure 1: Metals price indexes   (1960=100)

Source: *GEM Commodities* World Bank
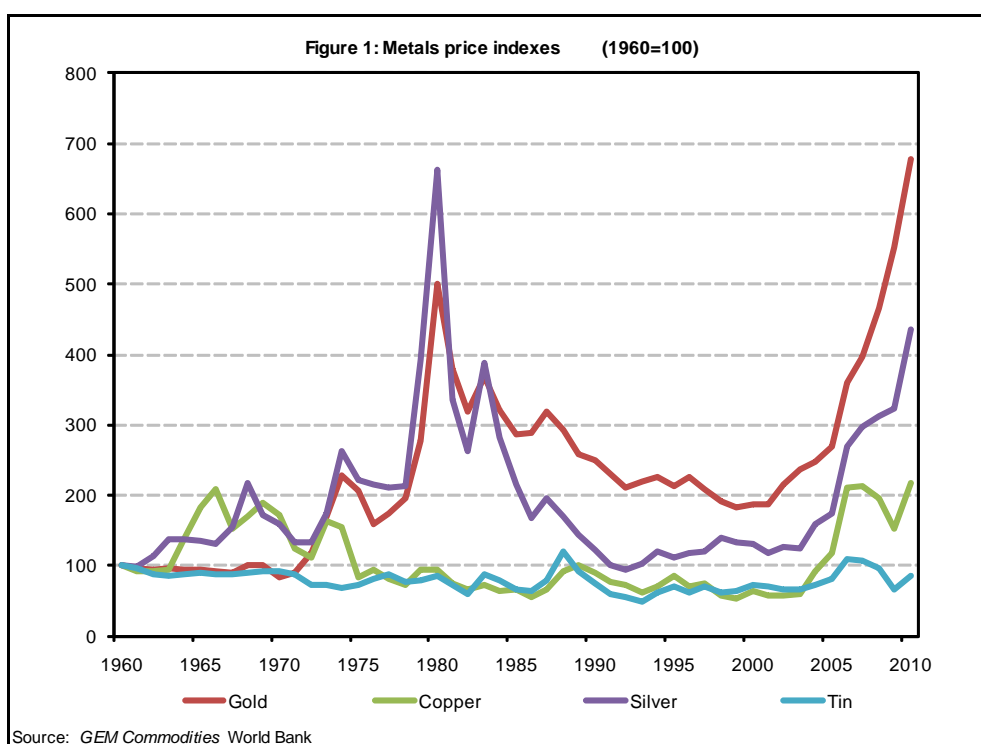
Mining exports represented 51.6% of total exports in 2003 and by 2010 they had mounted to 60.9%. In terms of GDP, mining exports almost doubled from 7.6% of GDP in 2003 to 14.1% of GDP in 2010. Moreover, the steep rise in metal prices augmented mining companies' margin profits, making the sector more attractive to investors. FDI inflows in mining reported by the Ministry of Energy increased from USD 462 million to over USD 4,000 million between 2003 and 2010, accounting for 20% of total FDI flows. According to the Central Bank, 40% of the investment plans announced for 2011

corresponded to the mining industry, followed by hydrocarbons with 16% of total investment (Diaz, 2011).

The mining windfall was also beneficial for public coffers. Between 2010 and 2003, mining related revenues escalated from 5% to almost 20% of total revenues. Corporate income taxes for mining companies, climbed from 0.3% of GDP in 2003 to 1.3% of GDP in 2010 (Figure 2). This signified a strong increase in the mining canon over this period. The total amount of the canon went from less than 300 million soles before 2003 to over 3,000 million soles in 2011 (Figure 3). Despite the price setback after the financial crisis in 2008, canon transfers remained high by any historic standard, and once again gained ground in 2011.

Figure 2: Mining revenues in Peru (1998 vs 2010)

Source: own calculations, SUNAT (2011)

Figure 3: Mining canon transfers in Peru

Source: Ministerio de Economía y Finanzas del Perú
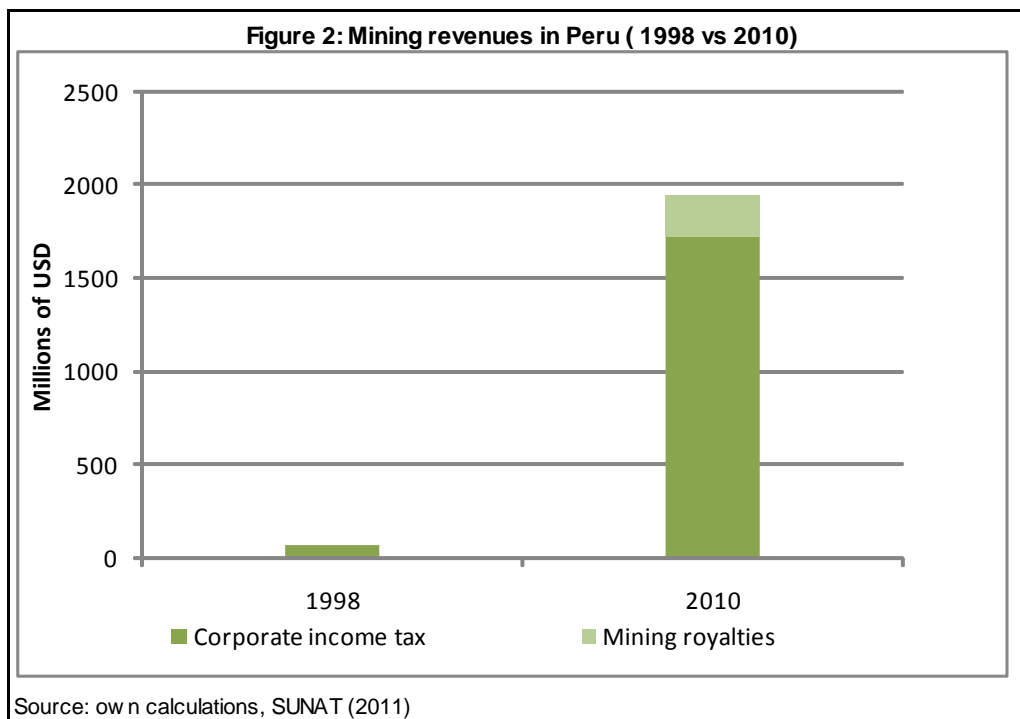
The pronounced increase in the mining canon in the past decade—particularly between 2003 and 2007, at the peak of the windfall—allows the evaluation of differences in fiscal performance between municipalities that benefited from the windfall, relative to non-recipient municipalities, considering that canon allocation mostly depends on geographic distribution of mining activities. The Mining Canon Law in Peru establishes an intergovernmental transfer system whereby a 50% fraction of the income taxes paid by mining companies is to be distributed to local governments where minerals are extracted[11]. This amount is allocated as follows: i) 25% of the canon goes to the regional governments of the municipality where the mine is located, plus an extra 5% for the public universities in the region; (ii) 10% goes to the district municipality where the mineral is extracted; (iii) 25% is directed to the municipalities of the province where the mineral is extracted; and (iv) the remaining 40% is distributed among the municipalities of the department where the mineral is extracted[12]. Figure 4 displays canon transfers allocation in 2006.

What has been the effect of the recent windfall in fiscal performance in mining rich regions? In a recent study, Sanguinetti (2010) examines the impact of the mining canon distribution on fiscal performance of local governments, and consequently, its effect on local development in Peru. For this purpose, the author evaluates whether the tax effort and the expenditure structure differ significantly between canon-

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[11] The income tax rate charged to mining companies is 30%.
[12] The distribution among district, province and department municipalities changed in 2009.

recipient municipal governments and non canon-recipient governments, before and after the windfall.

Figure 4: Geographic distribution of mining transfers (2006)

(Darker colors indicates larger transfers)

Source: Maldonado (2010)

The author examines whether these transfers negatively affect the tax collection by local governments. He finds no statistically significant substitution effect between local tax collection and canon transfers. In other words, canon-recipient municipalities do not reduce other taxes. Second, Sanguinetti evaluates whether the mining canon affects the quality and structure of public expenditure. The results indicate that a larger mining canon is, on average, associated with higher capital public expenditure, relative to current expenditure. The author relates this result to the regional mandate that states that canon transfers must be devoted to public investment by recipient local governments. The author also concludes that the canon transfers allocation may widen the regional development gap in Peru.

Has this increase in spending materialized in better policy outcomes in resource abundant municipalities? This is the question we address next.

4. Empirical strategy

In this section we present our empirical strategy to evaluate if Peruvian municipalities that received mining canon transfers present better welfare indicators than those that did not have access to this revenue source, before and after the windfall. We use a simple difference in differences approach. The exogenous international price shock increased profits for mining companies, as mineral exports proceeds soared. Taxes paid by mining companies escalated and, according to the canon law, local governments in mining districts benefited from the windfall, whereas local governments where there is no mining activity did not. In other words, mineral-abundant municipalities are our treatment group and non mineral-abundant municipalities our control group. The treatment is the increase in canon transfers between 2003 and 2007.

4.1. The Data

We use data from the National Registry of Municipalities (In Spanish, RENAMU), that collects annual statistical information of municipalities (district and provincial municipalities, and smaller populated areas) on the state of infrastructure, local public services, and social development policy. We use reported results for 1306 district and provincial municipalities (depending on the availability of the data for both years).

Policy outcomes indicators. (Dependent variables). Among the welfare indicators we considered variables reported directly by the Municipalities to RENAMU. These include per capita values of: (i) the number of centers of protection of children, teenagers, and the elderly administered by the municipality, and their beneficiaries; (ii) the total number communication centers that offer Internet services to the public operated by the local government; (iii) the number and amount of investment projects approved under the municipal budget; (iv) social organizations and beneficiaries; (v) public, private, and total number of health establishments in the municipality[13].

Mining canon. This variable measures the total windfall received by each municipality. It is reported on an annual basis by the *Ministerio de Economía y Finanzas* of Peru. We calculated the per capita values using the municipal population reported by RENAMU. The distribution system stated by the canon law only depends on the availability of mining activities in the region, regardless of social, economic or institutional elements that may be affecting mining extraction or prices. This makes the mining canon largely exogenous.

Control variables. We used specific municipal variables as controls, such as, type of municipality (district or provincial), and a variable that reflects citizens' participation in local government administration. In particular, the RENAMU reports several indicators of civic

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[13] Although there are a large number of policy outcomes, not all of them are available for both dates, so we resorted to the limited numbers analyzed in this paper.

participation, such as, the involvement in the definition of municipal budgets, development plans, and security decisions, among others. We use per capita values for these variables as well.

4.2. Results

The results presented in Table I indicate that a larger per capita canon generates a significant impact on the number and amount of per capita investments projects approved in the municipal budget. However, evidence suggests that those municipalities that perceived larger mining windfalls do not present significant improvements in performance indicators relative to the municipalities that did not benefit from the rise of this source of income.

For example, Table II shows that in the case of health indicators there is no significant difference in the change in the per capita number of municipal or public health establishments in municipalities that received higher mining windfalls relative to the rest. Similarly, the results do not support evidence in favor of a different impact of these transfers on per capita variables such as: the number of centers for the protection of children, teenagers, and the elderly and their beneficiaries (see Table III); the number and beneficiaries of social organizations (see Table IV); or the number of public communication centers that offer Internet services (see Table V).

Our evidence is consistent with findings in other studies about the impact of resource-related revenues in Latin America on the fiscal performance of local governments. For instance, in a similar vein, Caselli and Michaels (2011) find no evidence that Brazilian regions that benefited from oil royalties had better policy outcomes. They find that oil-abundant municipalities spent more than non oil-abundant municipalities on infrastructure, education and health services. Nonetheless, indicators of housing conditions, public infrastructure, schooling and health do not reveal significantly better conditions in oil-abundant regions. Furthermore, they argue that this apparent inefficiency may be related to corruption problems in oil-rich counties. For Argentina, Gelemur and Pochat (2011) find that provinces with larger oil royalties spend more, even though this does not necessarily imply higher levels of provision of health and education services, public goods, or substantial differences in basic indicators of social welfare.

Considering that these transfers are effectively associated with higher levels of spending, at least in the municipal budget, this evidence is not inconsistent with certain level of inefficiency in public policies.

What can explain the fact that the mining windfall is not correlated with a larger supply of public goods and services in resource-abundant municipalities? An administrative issue that may have limited the performance of Peruvian municipalities that receive these transfers is that, even though the income due to the mining canon must be used for investment projects, the feasibility studies prior to the investment could not be financed with canon resources[14]. This could explain some delays in the execution of investment projects. On the other hand, Maldonado (2010) finds that the rise of the mining canon between 2000 and 2006 significantly increased the probability of non-official payments (bribery) within a limited sample of regions that benefited the most from the mining windfall. Resources may have been deviated from the provision of public goods.

Finally, we controlled for citizens' participation in the local government administration, to examine one of the possible channels through which the presence of natural resources may affect governance quality and policy outcomes. RENAMU reports several indicators of civic involvement, such as, the involvement in the definition of municipal budgets, development plans, and security decisions, etc. Although we only report results with the variable measuring whether there is civic participation in the approval of local development plans, none of these variables appeared to alter previous results. If at all, participation was negatively correlated in some cases with policy outcomes. This may result from measurement errors in the variable. This is a subject to be explored in future research.

5. Final remarks

Resource-related revenues underpinned public expenditure expansion by local governments in mineral –rich municipalities. In this paper we addressed the question of whether mineral-rich municipalities outperform non mineral-rich municipalities in terms of certain policy outcomes, before and after the recent mining windfall in Peru. The exogeneity of the external shock and the fact that receiving or not the mining canon is independent of any municipal characteristics, other than the location of mining activities, guarantee the proper inference of the effect of resource related revenues on policy outcomes, using a simple difference in differences approach. We find that although canon recipient governments spent more during the windfall than non-recipient governments, there is no significant difference in terms of public goods provisioning between both types of municipalities.

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14 Since 2008, regulations allow municipalities to use a fraction of the canon for project feasibility studies, rather than solely financing them with current expenditure, as municipalities were forced to do before.

In particular, we find that a larger per capita canon has a significant impact on the amount and total number of per capita investment projects approved in the municipal budget. Nonetheless, when we evaluate performance indicators such as, the number of municipal or health establishments, social organizations, centers for the protection of children, teenagers, and the elderly, their beneficiaries, and the number of communication centers with access to Internet, we find evidence that suggests that those municipalities that received larger mining windfalls do not improve their performance indicators, relative to those who did not benefit from the additional source of income. Controlling for citizen participation in the municipal administration does not seem to alter our results.

Future research in this line could explore the possible channels through which the presence of natural resources affects governance and the quality of public policies. Although that was not the purpose of the paper, we tried to investigate whether citizen participation in public administration had any effect on policy outcomes. Our results were not in line with the theoretical arguments detailed in the first section. Nonetheless, it may be the case that the indicator is imprecise and measured with error.

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Appendix

Table I. Mining windfalls and investment projects

Dependent variable	Number of investment projects per capita				Total amount of investment projects			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
d(Canon)	1.01e-07	1.02E-07	1.01e-07	1.02e-07	0.2386233	0.2380679	0.2389275	0.2384005
	(0.015)	(0.015)	(0.014)	(0.014)	(0.001)	(0.001)	(0.001)	(0.001)
Municipal category	n.a.	-0.0000838	n.a.	-0.0000924	n.a.	66.2785400	n.a.	62.0791300
	n.a.	(0.363)	n.a.	(0.322)	n.a.	(0.323)	n.a.	(0.353)
Civic participation in development programs	n.a.	n.a.	.0001751	0.0001781	n.a.	n.a.	88.93905	86.9574800
	n.a.	n.a.	(0.192)	(0.186)	n.a.	n.a.	(0.045)	(0.050)
Constant	0.0004952	0.0005032	0.0003476	0.0003539	65.2543200	58.9547100	-9.7216090	-13.9516100
	(0.000)	(0.000)	(0.003)	(0.003)	(0.007)	(0.021)	(0.809)	(0.734)
Number of observations	1158	1158	1158	1158	1158	1158	1158	1158
F	5.88	3.05	3.93	2.65	11.02	5.90	7.58	5.21
Prob > F	0.0155	0.0478	0.0200	0.0476	0.0009	0.0028	0.0005	0.0014
R-squared	0.0046	0.0048	0.0057	0.0058	0.1843	0.1849	0.1861	0.1867
Root MSE	0.00199	0.00199	.00199	0.00199	675.47	675.48	674.98	675.02

Table II.

Dependent variable	Municipal health establishments				Public health establishments				Total health establishments			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
d(Canon)	0.0280041	0.0335181	0.0334734	0.0382654	-0.0162449	-0.0146782	-0.0163783	-0.014769	-0.0160223	-0.0151849	-0.016186	-0.0153026
	(0.304)	(0.224)	(0.252)	(0.190)	(0.200)	(0.252)	(0.195)	(0.249)	(0.149)	(0.176)	(0.144)	(0.172)
Municipal category	n.a.	-0.2067062	n.a.	-0.1888468	n.a.	0.2953474	n.a.	0.2941825	n.a.	0.3195911	n.a.	0.3182727
	n.a.	(0.495)	n.a.	(0.518)	n.a.	(0.002)	n.a.	(0.002)	n.a.	(0.001)	n.a.	(0.001)
Civic participation in	n.a.	n.a.	0.4201301	0.4012684	n.a.	n.a.	0.031031	0.0196627	n.a.	n.a.	0.035952	0.0250998
development programs	n.a.	n.a.	(0.279)	(0.264)	n.a.	n.a.	(0.592)	(0.737)	n.a.	n.a.	(0.531)	(0.664)
Constant	-0.0167709	0.0211431	-0.4097013	-0.3574225	0.3500664	0.3170387	0.3244643	0.3009463	0.3716829	0.3378606	0.3420769	0.3173307
	(0.865)	(0.826)	(0.289)	(0.307)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	73	73	73	73	1148	1148	1148	1148	1247	1247	1247	1247
F	1.07	0.87	0.96	0.83	1.65	5.49	1.04	3.79	2.09	6.68	1.36	4.65
Prob > F	0.3036	0.4224	0.3878	0.4835	0.1996	0.0042	0.3548	0.0101	0.1486	0.0013	0.2574	0.0031
R-squared	0.0069	0.0181	0.0275	0.0368	0.0017	0.0160	0.0019	0.0161	0.0017	0.0177	0.0020	0.0179
Root MSE	0.80666	0.80781	0.80392	0.80584	0.7406	0.73559	0.74083	0.73587	0.75705	0.75123	0.75723	0.75147

Table III. Mining windfalls and centers of protection of children, teenagers and the elderly

Dependent variable	Number of protection centers per capita				Number of beneficiaries, per capita			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
d(Canon)	6.78E-09	0.00	6.69E-09	6.75e-09	-2.62E-06	-2.62e-06	-0.00000272	-2.72e-06
	(0.408)	(0.400)	(0.404)	-0.397	(0.258)	(0.259)	(0.259)	(0.256)
Municipal category	n.a.	-0.0000142	n.a.	-0.0000123	n.a.	0.0000731	n.a.	0.0020238
	n.a.	(0.062)	n.a.	(0.453)	n.a.	(0.997)	n.a.	(0.921)
Civic participation in development programs	n.a.	n.a.	-0.0000279	-0.0000273	n.a.	n.a.	-0.0276557	-0.0277495
	n.a.	n.a.	(0.245)	(0.259)	n.a.	n.a.	(0.070)	(0.071)
Constant	0.0000206	0.0000221	0.0000437	0.0000445	0.0003668	0.0003591	0.0232262	0.0230916
	-0.055	-0.378	(0.037)	(0.035)	(0.955)	(0.959)	(0.086)	(0.087)
Number of observations	1347	1347	1347	1347	1347	1347	1347	1347
F	0.69	0.76	0.88	0.94	1.28	0.64	2.25	1.5
Prob > F	0.4077	0.4666	0.4132	0.4215	0.2583	0.5279	0.1062	0.2125
R-squared	0.0005	0.0007	0.0013	0.0014	0.0002	0.0002	0.0022	0.0022
Root MSE	0.00038	0.00038	0.00038	0.00038	0.23475	0.23484	0.2346	0.23469

Table IV. Mining windfalls and social organizations

Dependent variable	Number of beneficiaries of social organizations per capita				Social organizations per capita			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
d(Canon)	-0.000018	-0.0000177	-0.000018	-0.0000177	-0.0000121	-0.0000122	-0.0000121	-0.0000122
	(0.164)	(0.163)	(0.160)	(0.159)	(0.339)	(0.341)	(0.335)	(0.336)
Municipal category	n.a.	-0.0728417	n.a.	-0.0639829	n.a.	0.0304294	n.a.	0.0382957
	n.a.	(0.172)	n.a.	(0.228)	n.a.	(0.564)	n.a.	(0.466)
Civic participation in development programs	n.a.	n.a.	-0.0999597	-0.0968149	n.a.	n.a.	-0.0840855	-0.0859677
	n.a.	n.a.	(0.006)	(0.007)	n.a.	n.a.	(0.015)	(0.013)
Constant	-0.1069110	-0.0996159	-0.0285464	-0.0246039	-0.4311453	-0.4341928	-0.3652255	-0.3675853
	(0.000)	(0.000)	(0.396)	(0.468)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	1551	1551	1551	1551	1551	1551	1551	1551
F	1.93	2.12	4.46	3.30	0.91	0.58	3.21	2.45
Prob > F	0.1645	0.1202	0.0117	0.0196	0.3394	0.5610	0.0405	0.0616
R-squared	0.0019	0.0036	0.0081	0.0094	0.0009	0.0012	0.0053	0.0058
Root MSE	0.52306	0.52276	0.5216	0.52142	0.52045	0.52054	0.51947	0.51951

Table V. Mining windfalls and number of communication centers

Dependent variable	Number of communication centers per capita			
	(1)	(2)	(3)	(4)
d(Canon)	1.84e-08	1.58E-08	1.80E-08	1.53E-08
	(0.559)	(0.635)	-0.562	(0.641)
Municipal category	n.a.	0.0007705	n.a.	0.0007947
	n.a.	(0.001)	n.a.	(0.001)
Civic participation in development programs	n.a.	n.a.	-.0003437	-0.0003753
	n.a.	n.a.	(0.045)	(0.031)
Constant	0.0003337	0.0002541	.0006136	0.0005573
	(0.000)	(0.000)	(0.000)	(0.031)
Number of observations	1495	1495	1495	1495
F	0.34	5.57	2.22	3.89
Prob > F	0.5591	0.0039	0.1087	0.0088
R-squared	0.0001	0.0081	0.0027	0.0112
Root MSE	0.00263	0.00262	0.00263	0.00262