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Tax effort and oil royalties in the Brazilian municipalities

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Abstract

This paper estimates a stochastic production frontier, to investigate whether municipalities covered by oil royalties in the last decade have reduced their tax effort in Brazil. The issue is relevant to the prospect of a substantial increase in these revenues and the new rules for distribution of the funds, established by Law No. 12.734/2012. The inputs were provided by personnel and capital expenditures, whereas the product was defined as the municipal tax collection. With the purpose of overcoming the endogeneity problems due to reverse causality of output on inputs, we used the lagged independent variable as instruments in the inefficiency equation. The data set is composed of a panel of Brazilian municipalities from 2002 to 2011. The results indicate that oil revenues have a negative impact on the estimated efficiencies, signaling reduced fiscal effort by the benefiting municipalities.

JEL classification: H21; H71; Q38

Keywords: Oil windfalls; Stochastic frontier analysis; Tax effort; Municipalities; Endogeneity
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Resumo

Este artigo estima uma fronteira estocástica de produção a fim de investigar se os municípios beneficiados com royalties do petróleo na última década reduziram seu esforço tributário no Brasil. O tema é relevante devido à perspectiva de aumentos substanciais nestas receitas e às novas regras para distribuição destes recursos, definidos pela Lei 12.734/2012. Os insumos foram definidos pelas despesas de pessoal e de capital, enquanto o produto foi definido como a arrecadação tributária municipal. Com o propósito de contornar potenciais problemas de endogeneidade devido à possível causalidade reversa de produtos nos insumos, as defasagens das variáveis independentes foram usadas como instrumento na equação de ineficiência. O banco de dados é composto por um painel de municípios brasileiros observados de 2002 a 2011. Os resultados indicam que as receitas do petróleo possuem um impacto negativo significativo nas ineficiências estimadas, sinalizando uma redução do esforço fiscal nos municípios beneficiados.

Palavras-chave: Rendas do petróleo; Análise de fronteira estocástica; Esforço fiscal; Municípios; Endogeneidade
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1. Introduction

Law 9478/97, also known as “The Oil Law,” regulates the collection and sharing of oil rents between the Brazilian federated entities. A significant portion of these rents is distributed to a subset of states and municipalities that must fulfill some requirements, like proximity to producing areas or being affected by the activities of the oil industry.[1]

Despite the magnitude of oil windfalls available to those municipalities for over a decade, few studies assess the local impacts of these rents, particularly regarding the incentives to invest them in promoting municipal development. It is noteworthy that the Brazilian law proposes to channel oil revenues into investment and vetoes their use for payroll and debt service. Thus, it is important to analyze whether royalties[2] have generated positive changes in the realities of the benefiting municipalities.

Different studies suggest that there is no conclusive evidence on the impact of oil royalties on eligible localities. Depending on the chosen economic indicator, the evidence is favorable or contrary (or null) to the increase in local welfare. Some studies find positive impact on socio-economic development and on local welfare (Navarro, 2003; Alexandre, 2003; Gomes, 2007; Postali and Nishijima, 2013) whereas others do not observe significant differences in the evolution of social indicators between beneficiaries and non-beneficiaries (Reis, 2005; Giviez and Oliveira, 2008; Postali and Nishijima, 2011; Caçador and Monte, 2013). Mixed evidence depending on the social indicator under analysis are found in Postali and Nishijima (2008) whereas Postali (2009) concludes for negative impact of royalties on economic growth of beneficiaries.

The guidelines for investing oil windfalls motivated some studies that found evidence of positive relationship between these revenues and capital expenditure (Bregman, 2007), global investment (Leal and Serra, 2002) and social spending without significant improvements in public services (Caselli and Michaels, 2013). Regarding the political effects,[3] some studies show that oil royalties give electoral advantages for incumbent mayors (Monteiro and Ferraz, 2010), because they impact positively on the likelihood of reelection (Silva et al., 2013).

Regarding fiscal impacts, some studies have sought to verify whether oil revenues impair the fiscal discipline of the benefiting municipalities. The issue is very sensitive, as oil windfalls tend to be volatile, because they are closely linked to prices and production of hydrocarbons. Since the benefiting localities observe a positive shift in their budget constraints, they may be tempted to relax the incentive to collect their own taxes and/or to overspend (the flypaper effect). Preliminary evidence with data up to 2005 suggest that municipalities covered by oil revenues do reduce fiscal effort and overspend as consequence of royalties (Postali and Rocha, 2009; Queiroz and Postali, 2010); also, benefiting municipalities increase the number of civil servants (Monteiro and Ferraz, 2010).

This paper aims to contribute to the fiscal branch of the aforementioned literature. It proposes to investigate further the effect of royalties on the municipal tax effort. The methodology aims to estimate an efficient tax frontier to assess whether oil revenues can explain the distance of the municipality from this frontier.[4] The topic is relevant because the fiscal relaxation may contribute to the progressive weakening of the local tax base, creating a vicious circle of increasing dependence on federal and state funds.

Studies on the relationship between federation and incentives for spending and taxing gained momentum after the Constitution of 1988 in Brazil,[5] which allocated larger shares of public funds to states and municipalities, without

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[1] According to the Oil Law, 10% of the gross value of production of oil and natural gas should be collected by the National Treasury as royalty revenues. Beyond royalties, there is also a “Special Tax” – a resource rent tax levied on highly productive projects. In 2012, new rules on the distribution of royalties were approved (Law 12731/12), favoring non-producing localities at the expense of the current beneficiaries.

[2] From now on, by “royalties,” we mean “royalties plus special tax.”

[3] The political consequences of local expenditures in Brazil were studied by Meneguin and Bugarin (2001) and Meneguin et al. (2005), both collecting evidence on the linkage between public spending, voting and political power. There are strong evidence that high spending increases the likelihood of electing political allies or reelecting the incumbent mayor (Sakurai and Menezes Filho, 2008) and that the municipal budgets exhibit opportunistic and partisan cycles (Sakurai and Menezes Filho, 2011). Also Firpo et al. (2014) link local political power to public spending, concluding that federal deputies use amendments to reward their localities.

[4] Queiroz and Postali (2010) estimate a stochastic frontier with data up to 2005 using GDP and population as inputs. However, in order to make economic sense in a production function, inputs should be a variable under control of policymaker. The present paper meets this objective by introducing capital and personnel expenses in the production function.

[5] Countries organized as fiscal federalism aim to equalize the fiscal capacities between their regions (Dahlby and Wilson, 1994; Oates, 1999). The evidence suggests that the separation between the power to tax and the decision to spend in the presence of grants coming from upper levels of government under a federated system induces an increase in the size of local public budgets through distortive taxes and overspending (Winer,

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