



# Effect of an Income Shock on Subnational Debt: Micro Evidence from Mexico

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## Introduction

- Fundamental problem of fiscal decentralization: Subnational governments have few own resources to meet expenditures decided centrally  $\Rightarrow$  High reliance on federal transfers  $\Rightarrow$  Large variability of local revenues when transfers are discretionary.
- For local governments, there is a trade off between:
- Accessing credit markets:** Gives more financial autonomy and ability to smooth income
- Avoiding excessive debt:** Affects the path of future taxes and expenditures and the sustainability of local public finances  $\rightarrow$  Measures to prevent overborrowing:
  - Fiscal rules
  - No-bailout commitment by central government
  - Financial sector regulations
- Given this trade-off, are local governments able to smooth income using debt?
- Research question:** How does municipal debt respond to a shock that affects the distribution of federal transfers?
  - Negative** effect on **credit demand** if grants and debt are substitutes.
  - Positive** effect on **credit supply** given that grants can collateralize debt.

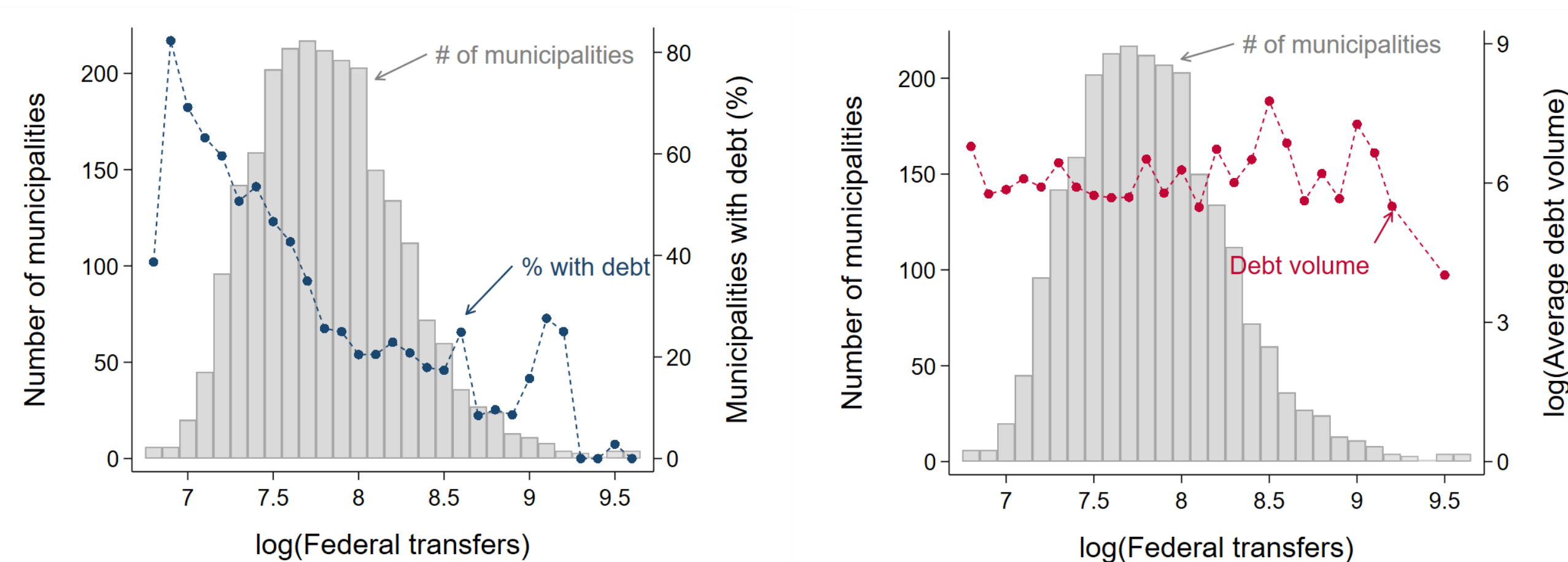


Figure 1. Municipal debt with financial institutions by level of federal transfers

## Econometric framework

- States distribute federal grants to municipalities based largely on **official population figures**.
- Identification:** Exploits **discrete** changes in transfers with the long-term updating of population.

- Financial needs are correlated with current population that changes **continuously**.
- Income shock to municipality  $m$ :** Change in population between 2010 Census and 2005 Count (similar to Gordon, 2004; J. Public Econ):

$$\Delta \log Pop_m = \log Pop_{m,2010} - \log Pop_{m,2005}$$

- Regression model (municipality-bank-month $\times$ year level):

$$\Delta y_{m,b,t} = \alpha_0 + \alpha_1 \log Pop_m + \alpha_2 X_{m,t-1} + \alpha_3 \Delta X_{m,t-\tau} + \alpha_4 \Delta X_{b,t-1} + \alpha_s + \alpha_b + \alpha_t + \epsilon_{m,t}$$

- $\Delta y_{m,b,t}$ :  $\Delta_{t:Oct10}$ , in debt of municipality  $m$  with bank  $b$
- $X_{m,t-1}$ : local elections; local economic conditions
- $\Delta X_{m,t-\tau}$ :  $\Delta_{t-1:Oct10}$ , in local economic conditions;  $\Delta_{08:05}$  and  $\Delta_{10:08}$ , in federal transfers, other revenues, current & capital expenditures, and fiscal deficit;  $\Delta_{05:00}$ , in population
- $\Delta X_{b,t-1}$ :  $\Delta_{t-1:Oct10}$ , in bank's  $b$  assets, liquidity and capital ratios
- $\alpha_s, \alpha_b, \alpha_t$ : state, bank, and time fixed effects

## Results

- Over the first two post-census years, a one-standard-deviation increase in the population shock leads to:
  - An increase in federal transfers of 2% relative to pre-census levels
    - Large and permanent effect
    - No effect on other sources of municipal revenue
  - A decline in the probability of having debt of 0.1 percentage points
    - Prevalence of moderate demand-side response: 2.3% of municipality-bank pairs have debt
    - Stronger effects from municipalities less transfer dependent, perceived as more creditworthy
    - Decline in debt volume after first two years
  - An increase in primary expenditures of 1%
    - Driven by current expenditures: material, inputs and supplies; general services
    - No increase in capital expenditures  $\Rightarrow$  little potential to improve long-term growth

Dependent variables:	$\Delta \log(\text{Fed. transfers})$	$\Delta \log(\text{Other transfers})$	$\Delta \log(\text{Own revenue})$	$\Delta \text{Has debt}$	$\Delta \log(\text{Debt volume})$	$\Delta \text{Total expendit.}$
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \log(\text{Population})$	32.60*** (6.52)	-25.94 (-.47)	8.16 (.38)	-1.66** (.70)	42.07 (53.10)	18.45** (2.77)
Mean dep. var.	6.25	44.64	9.56	-.01	7.19	5.27
Year, state FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	-	-	-	Yes	Yes	-
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Lagged outcomes	Yes	Yes	Yes	Yes	Yes	Yes
IPW	Yes	Yes	Yes	Yes	Yes	Yes

Table 1. Estimates of the effect of the census shock on municipal revenues, debt, and expenditures

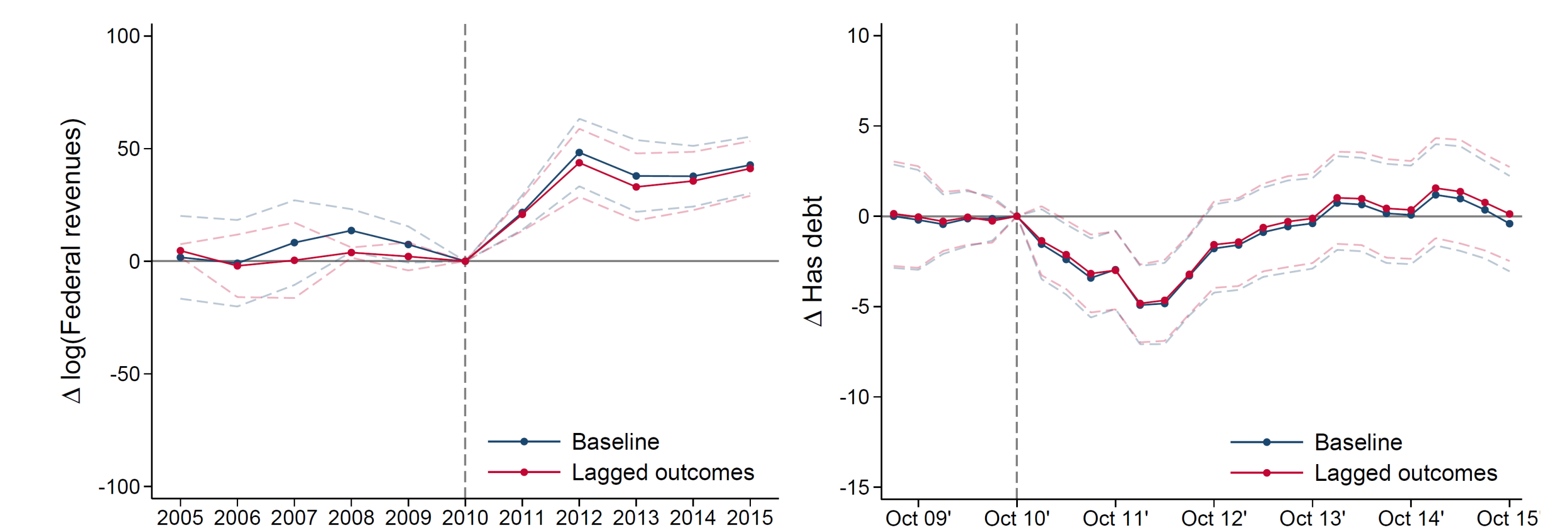


Figure 2. Dynamic effects on federal transfers and the probability of having debt

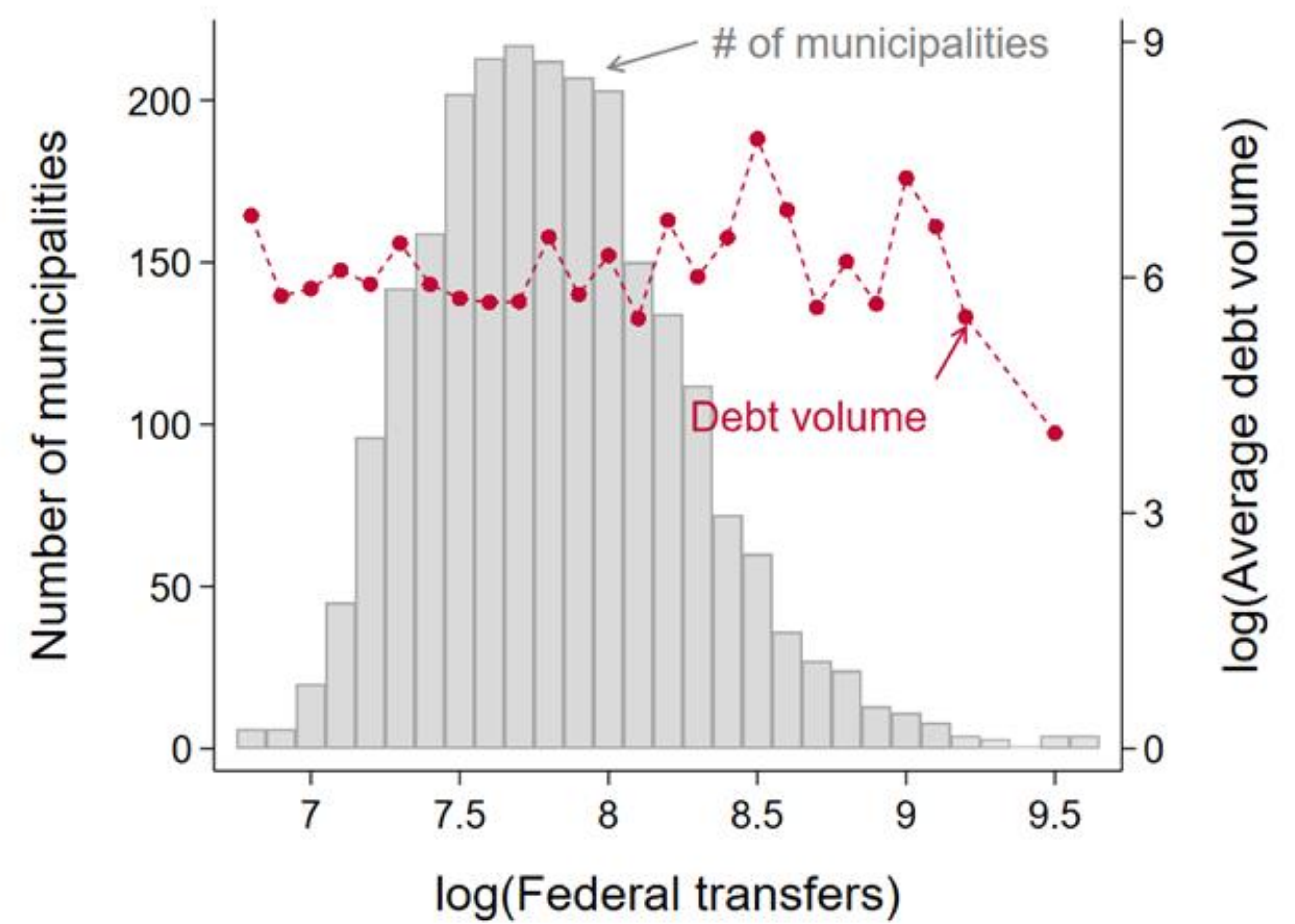
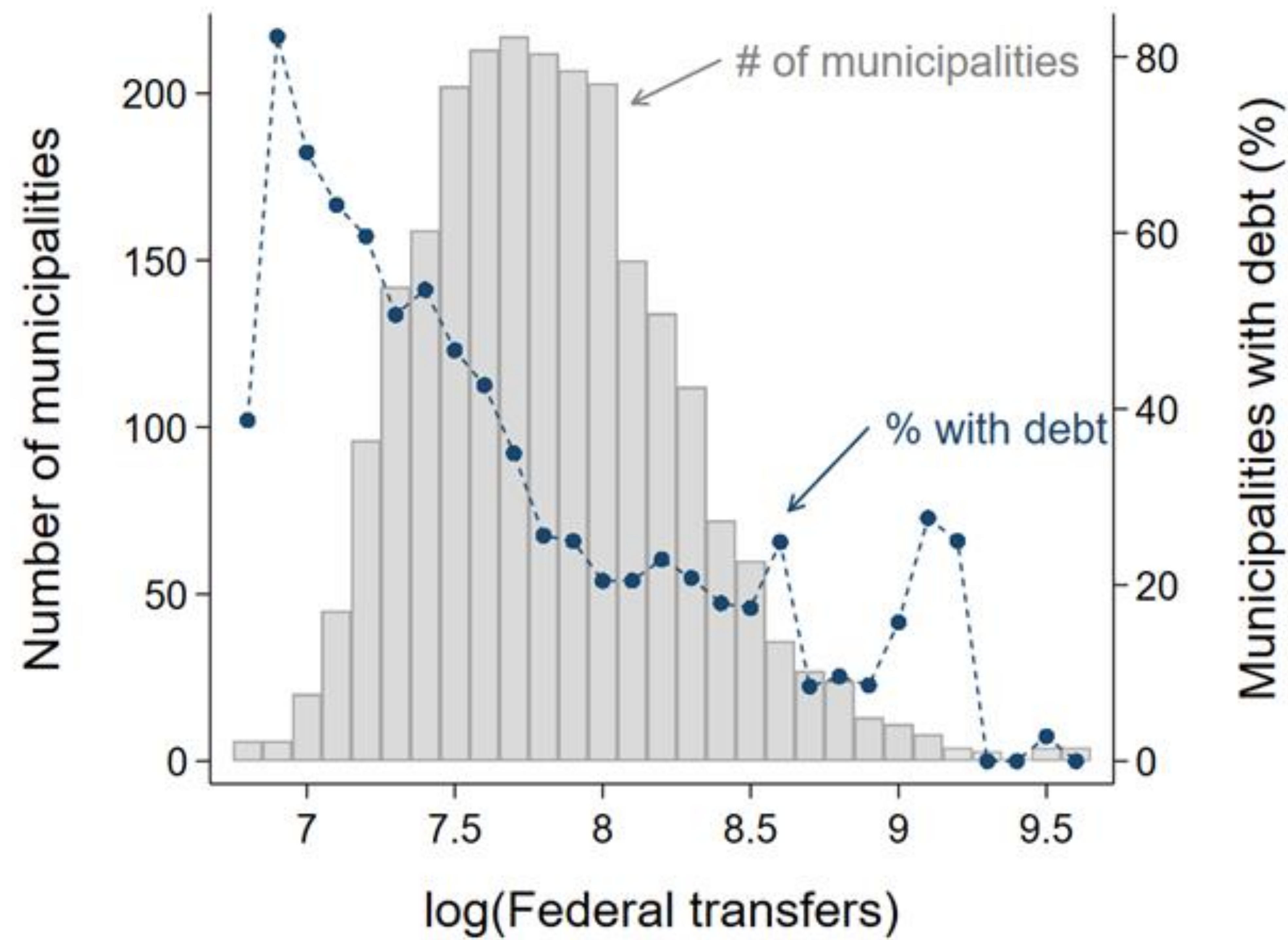
## Conclusion

- Only a few governments with higher financial autonomy can smooth shocks using debt.
- No positive effect of grants on local debt.
- Policy implications:**
  - Diversifying the revenue base of local governments enhances their access to credit markets: Higher tax collection capacity signals higher creditworthiness.
  - Even if enforcement of fiscal rules is weak, market forces (no-bailout commitment and financial sector regulations) can lead to financial discipline.

## Contact

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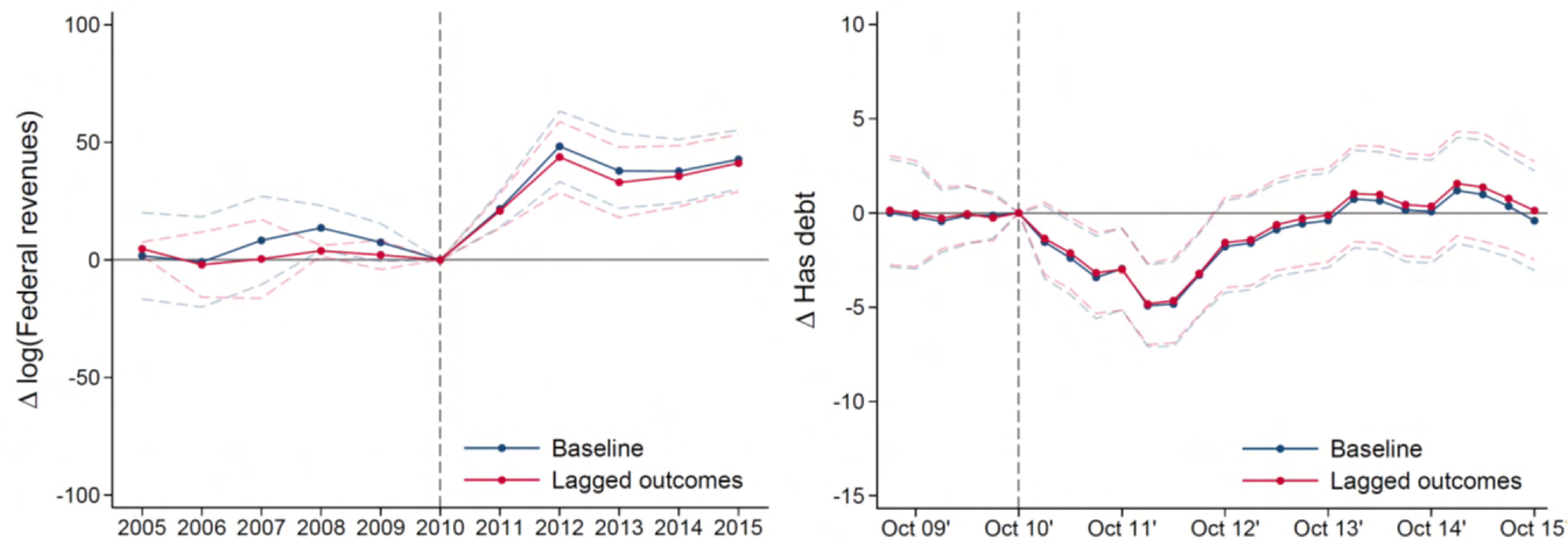
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