Rent Capture or Regional Forces? Fiscal Interaction in Metropolitan Areas

Steven Craig, Oscar Galvez-Soriano, Annie Hsu, and Janet Kohlhase

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Introduction

- **Metropolitan fiscal restructuring in the long run:**
  - Suburbanization reallocates tax bases across jurisdictions
  - Central cities retain broader service mandates and legacy costs
  - Fiscal outcomes exhibit strong city–suburb co-movement
- **Research question: What drives metropolitan fiscal co-movement?**
  - **Strategic interaction:** Central cities respond to suburban fiscal expansion (e.g., rent extraction)
  - **Common regional shocks:** Fiscal co-movement reflects shared regional economic forces

Conceptual Framework: Rent Extraction vs. Fiscal Fundamentals

- **Rent extraction mechanism**
  - Besley and Case (1995): political agency framework
  - Some incumbents may set taxes above service cost
  - Empirical implication: revenue growth without proportional service expansion
- **Why central cities may have fiscal slack**
  - Legacy infrastructure and rigid expenditure commitments
  - Broader service mandates
  - Relatively immobile tax bases
  - $\Rightarrow$ Potential for asymmetric fiscal response to suburban expansion

Competing Mechanism: Spatial Equilibrium vs. Strategic Response

- **Brueckner (2001, 2003): Tax competition in spatial equilibrium**
  - Tax rates may co-move due to strategic interaction
  - Common economic shocks
  - Common institutional constraints
  - Mobility responses to regional conditions
- **Empirical concern:**
  - Insufficient regional controls can misattribute equilibrium co-movement to strategic fiscal response.

Main Contributions

- **Reinterprets metropolitan fiscal co-movement:** Shows that city–suburb fiscal correlation largely reflects shared regional economic forces rather than strategic rent extraction.
- **Clarifies identification in local public finance:** Shows that insufficient regional controls can mechanically generate spurious evidence of strategic behavior.
- **Extends tax competition theory to long-run fiscal restructuring:** Bridges Brueckner's equilibrium framework with multi-decade metropolitan fiscal dynamics.

Data

- Fiscal Data: U.S. Census Bureau's Annual Survey of State and Local Government Finances
- Population Data: U.S. Census Bureau's Population and Housing Unit Estimates Dataset
- Employment Data: Census Bureau's County Business Pattern
- Demographic variables: US Census Bureau's USA Counties database
- External Price Shock (EPI index): Bureau of Labor Statistics
- TFP Shock (interindustry propagation of macroeconomic shocks): NBER–CES industry productivity data

Empirical Strategy

- **Estimating central city fiscal response to suburban fiscal expansion**
  - Endogeneity addressed using an IV strategy
  - Instruments: average suburban fiscal behavior within-state and out-of-state
- **Testing mechanism via expenditure composition**
  - Examine heterogeneous responses across spending categories
  - **Basic services:** fire, police, libraries, parks, highways
  - **Transfers:** health, hospitals, welfare, housing
  - **Other operations:** corrections, judicial/legal, etc.

Summary Statistics

Table 1: Central Cities and their Suburbs' Revenue and Expenditure (1972-2017)

	All MSAs (68)			States with Multiple MSAs (52)		
	Central city	**Surrounding suburbs**	City exceeds suburbs (%)	**Central city**	**Surrounding suburbs**	City exceeds suburbs (%)
Total Revenue	2,094.9	1,076.8	94.5	2,147.9	1,114.4	92.7
	(1315.9)	(698.3)		(1,385.2)	(721.2)	
Total Taxes	688.4	384.8	78.9	708.4	397.1	78.4
	(457)	(234.9)		(478)	(211)	
Current Operation	1,415.9	798.9	77.2	1,477.4	834.6	77.0
	(971.7)	(574.4)		(1,028.3)	(604.7)	
Basic Exp	444.8	284	56.7	441.1	282.8	55.9
	(153.7)	(121)		(154.1)	(123.8)	
Transfer Exp	177.6	41.5	327.9	186.5	45.5	309.9
	(339.6)	(77.2)		(375)	(85.6)	
Other Exp	539.9	285.3	89.2	547.5	288.1	90.0
	(508.9)	(288.3)		(517.9)	(279)	
Observation	3,128	3,128		2,392	2,392	

Main Specification

$$\Delta \text{Rev}_{it}^{CC} = \alpha_0 + \alpha_1 \widehat{\Delta \text{Rev}_{it}^{Sub}} + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

$$\Delta \text{Exp}_{it}^{CC} = \beta_0 + \beta_1 \widehat{\Delta \text{Exp}_{it}^{Sub}} + \mu_i + \tau_t + \varepsilon_{it} \quad (2)$$

- α_1, β_1: Central city fiscal response to suburban fiscal expansion
- Fixed effects:
  - MSA and Year fixed effects
  - or Census division $\times$ year fixed effects (in preferred specification)
- Suburban fiscal variables instrumented to isolate exogenous variation in suburban fiscal expansion.

Identification: Instrumenting Suburban Fiscal Expansion

- **IV:** Average fiscal growth of other suburban governments
  - Within the same state + In other states
- **First stage:**

$$\Delta \text{Rev}_{it}^{Sub} = \alpha_1' \Delta \text{Rev}_{-it}^{Sub,in} + \alpha_2' \Delta \text{Rev}_{-it}^{Sub,out} + \mu_i + \tau_t + \varepsilon_{it} \quad (3)$$

$$\Delta \text{Exp}_{it}^{Sub} = \beta_1' \Delta \text{Exp}_{-it}^{Sub,in} + \beta_2' \Delta \text{Exp}_{-it}^{Sub,out} + \mu_i + \tau_t + \varepsilon_{it} \quad (4)$$

- **Identification logic:**
  - Relevance: suburban fiscal policies co-move within states and nationally
  - Exclusion: conditional on year or division $\times$ year fixed effects, these averages do not directly affect central city fiscal outcomes

Baseline Results: Year Fixed Effects

Table 2: IV based on in-state and out-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. Structural Equation (2SLS)						
x_{it}^{suburb}	-0.05	0.39***	0.20**	0.16**	0.12	0.15
	(0.12)	(0.10)	(0.07)	(0.06)	(0.07)	(0.10)
R^2	0.24	0.11	0.07	0.08	0.02	0.05
KP F-stat	17.10	32.52	20.78	26.66	12.54	27.11
MSA fixed effect	v	v	v	v	v	v
Year fixed effect	v	v	v	v	v	v
Observations	2,340	2,340	2,340	2,340	2,340	2,340
Panel B. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \alpha_{TT} = \beta_{BE}$ p-value=0.02 Reject H_0						

Sample: States with multiple MSAs, 1972-2017

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Rent extraction:
  - Tax revenue elasticity (0.39) exceeds basic expenditure elasticity (0.16)
  - Reject equality at p = 0.02

Absorbing Regional Shocks: Division × Year Fixed Effects

Table 3: IV based on in-state and out-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. Structural Equation (2SLS)						
x_{it}^{suburb}	0.10	0.18*	0.11	0.14*	-0.03	0.19*
	(0.12)	(0.07)	(0.06)	(0.06)	(0.09)	(0.09)
R^2	0.00	0.00	-0.00	-0.00	-0.00	-0.01
KP F-stat	23.96	21.19	28.02	27.70	15.06	11.45
MSA fixed effect	v	v	v	v	v	v
Division-by-year fixed effect	v	v	v	v	v	v
Observations	2,340	2,340	2,340	2,340	2,340	2,340
Panel B. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \alpha_{TT} = \beta_{BE}$ p-value=0.33						

Sample: States with multiple MSAs, 1972-2017

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Once regional (division × year) shocks are absorbed, the asymmetric response attenuates
  - Year FE only: Tax response > Basic expense response
  - Division × Year FE: Tax response ≈ Basic expense response

Alternative Sample and Instrument: All States

- Using all states and a single suburban instrument yields similar asymmetric responses under year fixed effects.

Table 4: IV based on all-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. Structural Equation (2SLS)						
x_{it}^{suburb}	0.16*	0.23***	0.06	0.07	0.09	0.02
	(0.08)	(0.04)	(0.04)	(0.04)	(0.05)	(0.06)
R^2	0.23	0.11	0.08	0.07	0.02	0.05
KP F-stat	50.92	123.78	54.33	114.42	10.79	27.91
MSA fixed effect	v	v	v	v	v	v
Year fixed effect	v	v	v	v	v	v
Observations	3,060	3,060	3,060	3,060	3,060	3,060
Panel B. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \alpha_{TT} = \beta_{BE}$	p-value=0.002	Reject H_0				

Sample: All States, 1972-2017

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Evidence consistent with asymmetric fiscal response under limited regional controls.

Robustness: All States with Division × Year Fixed Effects

- Once regional shocks are absorbed, the asymmetric fiscal response attenuates in the full sample.

Table 5: IV based on all-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. Structural Equation (2SLS)						
x_{it}^{suburb}	0.16*	0.15***	0.03	0.07	0.04	0.02
	(0.08)	(0.04)	(0.04)	(0.04)	(0.04)	(0.06)
R^2	0.00	0.01	-0.00	-0.00	0.00	-0.00
KP F-stat	54.27	258.98	63.03	125.46	11.44	29.53
MSA fixed effect	v	v	v	v	v	v
Division-by-year fixed effect	v	v	v	v	v	v
Observations	3,015	3,015	3,015	3,015	3,015	3,015
Panel B. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \alpha_{TT} = \beta_{BE}$ p-value=0.08						

Sample: All States, 1972-2017

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Year FE only: Tax response > Basic expense response
- Division × Year FE: Tax response ≈ Basic expense response

Alternative Identification: Bartik (shift–share) Instrument

$$\Delta \text{Rev}_{it}^{CC} = \alpha_1 \widehat{\Delta \text{Rev}_{it}^{Sub}} + \mu_i + \tau_t + \varepsilon_{it} \quad (5)$$

$$\Delta \text{Exp}_{it}^{CC} = \beta_1 \widehat{\Delta \text{Exp}_{it}^{Sub}} + \mu_i + \tau_t + \varepsilon_{it} \quad (6)$$

- Suburban fiscal growth instrumented using a Bartik IV.
- Provides an external, nationally-driven source of suburban economic variation.
- Tests whether asymmetric fiscal responses persist when suburban expansion is driven by national industry trends.
- Specifications include year or division $\times$ year fixed effects; SEs clustered at the MSA level.

Construction of the Bartik (Shift–Share) Instrument

- Instrument suburban fiscal growth using industry-driven labor demand shocks.
- **Shift–share structure:**

$$BIV_{it} = \sum_{j=1}^{J} s_{ij,1980} \cdot g_{jt}$$

  - $s_{ij,1980}$: initial suburban employment share in MSA i in industry j
  - g_{jt}: national growth rate of industry j in year t

- First stage:

$$\Delta \text{Fiscal}_{it}^{Sub} = \sum_{j} \gamma_j BIV_{ijt} + \tau_t + \varepsilon_{it}$$

Bartik IV Results (1990–2017)

Table 6: Effects of suburbs on central cities

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Structural Equation (2SLS)						
x_{it}^{suburb}	0.684	0.343	-0.284	-0.666	-0.214	0.310
	(0.812)	(0.269)	(0.463)	(0.752)	(0.612)	(0.431)
KP F-stat	15.67	11.16	9.95	10.60	8.69	12.90
MSA fixed effect	v	v	v	v	v	v
Year fixed effect	v	v	v	v	v	v
Observations	1,624	1,624	1,624	1,624	1,624	1,624

Exclude one-county MSAs.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Estimates do not deliver robust asymmetric responses.
- Adding division $\times$ year fixed effects renders the Bartik first stage weak in this setting.

Conclusion

- Asymmetric fiscal responses are not robust to division $\times$ year controls.
- Shared regional economic shocks—not strategic rent capture—drive fiscal co-movement.
- Alternative IV designs yield no evidence of rent-seeking asymmetry.
- **Contribution:** Clarifies identification in spatial fiscal interaction and extends tax competition insights to long-run metropolitan fiscal structure.

Fundamental Identification

Q1. Why is suburban fiscal expansion exogenous to central city policy?

- Fiscal policies may be jointly determined within the metro.

Response:

- Instrument suburban changes using external suburban averages.
- MSA fixed effects absorb time-invariant metro characteristics.
- Division×year FE absorb shared regional macro shocks.

Mechanical Correlation Concern

Q2. Could fiscal co-movement simply reflect shared tax bases?

- Cities and suburbs share labor and housing markets.

Response:

- MSA fixed effects absorb time-invariant shared tax base characteristics.
- Division×year FE absorb time-varying regional economic shocks.
- Once these shared exposures are controlled for, the asymmetry disappears.

Conclusion: Apparent strategic behavior reflects common regional forces rather than rent extraction.

Fixed Effects Architecture

Q3. Why not include state × year fixed effects?

- One IV is constructed from within-state suburban averages.
- State×year FE absorb most identifying variation.
- First-stage F-stat collapses.

Conclusion: State×year FE over-saturate the model.

Fixed Effects Tradeoffs

Q4. Why not MSA × year fixed effects?

- Would fully absorb suburban fiscal variation.
- Eliminates identifying variation.

Q5. Why not rely only on year FE?

- Year FE capture national shocks only.
- Regional cycles vary across divisions.

Design Logic: Division×year FE balance shock absorption with identification.

Instrument Strength

Q6. Are null results driven by weak IV bias?

- Main IV strong.
- Bartik IV strong.
- EPI and TFP are robustness checks.

Response: No rent-seeking asymmetry appears even under strong instruments.

Alternative IV Structure

Q7. Why not rely only on the out-of-state IV and include state×year FE?

- Out-of-state IV alone weakens the first stage.
- Precision declines.

Conclusion: Using both IVs strengthens identification.

Interpretation and Mechanism

Q8. Is this tax competition rather than rent capture?

- Tax competition predicts negative reaction functions.
- We observe positive co-movement.
- Co-movement disappears under regional FE.

Interpretation: Regional exposure dominates strategic substitution.

Functional Form and Heterogeneity

Q9. Could strategic behavior be nonlinear or institutional?

- Results robust across log-differences and levels.
- No asymmetric revenue vs expenditure pattern.
- No systematic institutional heterogeneity.

Conclusion: No hidden rent-extraction mechanism detected.

Contribution and Big Picture

Q10. If there is no rent capture, what is the contribution?

- Demonstrates insufficient regional controls can falsely imply strategic extraction.
- Shows metropolitan fiscal co-movement is regionally driven.
- Provides empirical support for regional equilibrium logic.

Takeaway: Null results are informative when they overturn a commonly inferred mechanism.

First Stage Coefficients

Q11. Why are first-stage coefficients negative?

Response:

- IV relevance requires strength, not a specific sign.
- The IVs capture external suburban fiscal shocks.
- Negative coefficients are consistent with fiscal substitution or competitive adjustment.
- With MSA and division×year FE, remaining variation reflects relative deviations.

Conclusion: The sign does not threaten identification; it reflects competitive or relative fiscal dynamics.

Effects of Suburbs on Cities with Year fixed effects Sample: States with multiple MSAs, 1972-2017

Table 2: IV based on in-state and out-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. First Stage						
$x_{-it}^{in-state}$	-0.60***	-0.30**	-0.49***	-0.53***	-0.11*	-0.30*
	(0.15)	(0.09)	(0.12)	(0.11)	(0.06)	(0.12)
$x_{-it}^{out-state}$	-17.13***	-18.21***	-16.31***	-20.45***	-10.38***	-19.91***
	(3.00)	(2.61)	(2.56)	(2.92)	(2.14)	(3.76)
Panel A. Structural Equation (2SLS)						
x_{it}^{suburb}	-0.05	0.39***	0.20**	0.16**	0.12	0.15
	(0.12)	(0.10)	(0.07)	(0.06)	(0.07)	(0.10)
R^2	0.24	0.11	0.07	0.08	0.02	0.05
Kleibergen-Paap	17.10	32.52	20.78	26.66	12.54	27.11
Year fixed effect	v	v	v	v	v	v
Observations	2,340	2,340	2,340	2,340	2,340	2,340
Panel B. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \alpha_{TT} = \beta_{BE}$ p-value=0.02 Reject H_0						

Period analyzed is 1972-2017.

Variables expressed in log differences.

Robust standard errors are in parentheses, clustering at the MSA level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Effects of Suburbs on Cities with Year fixed effects Sample: All States, 1972-2017

Table 4: IV based on all-state suburbs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Revenue (TR)	Tax Revenue (TT)	Current Operations (CO)	Basic Expense (BE)	Transfer Expense (TranE)	Other Expense (OE)
Panel A. First Stage						
$x_{-it}^{all-suburbs}$	-52.97***	-62.81***	-48.64***	-62.45***	-29.05**	-53.56***
	(7.39)	(5.65)	(6.60)	(5.84)	(8.94)	(10.14)
Panel B. Structural Equation (2SLS)						
x_{it}^{suburb}	0.16*	0.23***	0.06	0.07	0.09	0.02
	(0.08)	(0.04)	(0.04)	(0.04)	(0.05)	(0.06)
R^2	0.23	0.11	0.08	0.07	0.02	0.05
Kleibergen-Paap	50.92	123.78	54.33	114.42	10.79	27.91
Year fixed effect	v	v	v	v	v	v
Observations	3,060	3,060	3,060	3,060	3,060	3,060
Panel C. Coefficients Comparison (Reporting P values from T-test)						
$H_0 : \beta_{TT} = \beta_{BE}$ p-value=0.002 Reject H_0						

Period analyzed is 1972-2017.

Variables expressed in log differences.

Robust standard errors are in parentheses, clustering at the MSA level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$